DOCUMENT OF THE EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT

KYRGYZSTAN

EBRD-Special Climate Change Fund

Promoting Climate Resiliency of Water Supplies in Kyrgyzstan

Project Document

DRAFT

Version 1-1

Last updated 15 May 2013

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Abbreviations and acronyms

ADB	Asian Development Bank
BVK	Bishkek Water Company (“Bishkekvodokanal”)
CDP	Corporate Development and Stakeholder Participation Programme
DPCC	Development Partners’ Coordination Council
EBRD	European Bank for Reconstruction and Development
ESAP	Environmental and Social Action Plan
FGD	Focus group discussions
FoWUC	Forum of Water User Committees
FS	Feasibility study
GEF	Global Environment Facility
IFC	International Finance Corporation
IFCA	Investment Facility for Central Asia
IFI	International Financial Institutions
IFRS	International Financial Reporting Standards
MEI	Municipal Environmental Infrastructure
NGO	Non-governmental organizations
O&M	Operation and maintenance
PIF	Project Identification Form
PIP	Priority Investment Programme
RWSSP	Rural Water Supply and Sanitation Project (World Bank)
SCCF	Special Climate Change Fund
SDRD	State Department for Reconstruction and Development (of Osh and Jalalabad Cities)
SECO	State Secretariat for Economic Affairs (Swiss)
SEP	Stakeholder Engagement Plan
SNC	Second National Communication (to the UNFCCC)
TC	Technical cooperation (technical assistance)
TTS	Talas Municipal Water Utility (“Talas Taza Suu”)
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNFCCC	United National Framework Convention on Climate Change
WUC	Water User Committees
WWTP	Waste Water Treatment Plant

Executive summary

Kyrgyzstan is one of the most vulnerable countries to climate change in the EBRD region. Kyrgyzstan's Second National Communication (SNC)[1] identified impacts on water resources as one of the most severe climate change risks facing the country. The SNC also notes the importance of taking adaptive measures to safeguard the basic consumers of water resources in Kyrgyzstan and neighbouring states. In addition, Kyrgyzstan faces immense challenges in rebuilding and maintaining the basic infrastructure of its urban areas. Since Kyrgyzstan achieved independence in 1991, the availability and quality of public infrastructure and basic services has deteriorated rapidly.

The EBRD began working on water projects in Kyrgyzstan in 2009. As part of this work, the EBRD developed a *Water and Wastewater Framework* that comprises water and wastewater projects throughout the country. The EBRD's investment program in Kyrgyzstan's water sector seeks to rehabilitate the water supply infrastructure in cities under the Framework. As these investments do not explicitly address vulnerabilities due to climate change, this project aims to fill that gap.

The project's objective is to improve the climate resiliency of water supply in cities in the Kyrgyz Republic by fully mainstreaming climate change considerations into water infrastructure rehabilitation. This project is co-funded by:

- The EBRD - USD 15.65 million in investment/loan and USD 740,000 in TC funds;
- The Special Climate Change Fund (SCCF) – USD 3 million in investment grant and USD 2 million in TC funds; and
- Additional donor grants via the EBRD – USD 18.83 million.

Activities in this project will be of two types: (1) capacity building, intensive technical cooperation, and awareness raising; and (2) targeted investment interventions. Participation in capacity building and awareness raising activities will be open to all cities in the country and particularly focused on cities in which the EBRD is active including Bishkek, Talas, Kant, Batken, Jalalabad, Karabalta, Naryn, Tokmok and Osh. Intensive technical cooperation will be oriented towards cities in certain river basins. Targeted investment interventions will be made in two cities that have been evaluated as being vulnerable to climate change: Talas and Bishkek.

To meet the proposed project objective, the following outcomes are sought:

1. Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas;
2. Decreased water demand and improved climate resilient supply of drinking water, reducing pressure on climate-vulnerable water resources;
3. Institutional capacity developed and governance of water companies and city authorities strengthened for integrating climate change impacts into water resources management; and
4. Increased community involvement and awareness of climate issues in water governance.

These outcomes will be achieved through a project consisting of several interrelated components:

- Component 1 – Integrating climate change assessments into the design and appraisal of water infrastructure;
- Component 2 – Building in additional climate-resiliency features in water infrastructure rehabilitation projects;
- Component 3 – Increasing capacity for water governance;
- Component 4 – Increasing community involvement in water governance and raising knowledge and awareness of climate change implications among water users.

This project will be directly executed by the EBRD. The project team consists of bankers and specialists from the Municipal Environmental Infrastructure (MEI) team and the EBRD's Bishkek Office. Within the project activities Water User Committees will be set up, which will enable water users (citizens) to participate in the process of rehabilitation of their water supply and keep informed about work done on the project. Their opinions and feedback will be reported back to the water companies and to the Project Implementation Unit and Consultants working on the project.

[1] Government of Kyrgyzstan (2009) Second National Communication to the UNFCCC.

1 Background, baseline, problem and barriers

1.1 Kyrgyz urban infrastructure related to water

1. Kyrgyzstan faces immense challenges in rebuilding and maintaining the basic infrastructure of its urban areas. Since Kyrgyzstan achieved independence in 1991, the availability and quality of public infrastructure and basic services has deteriorated rapidly. Currently, water supply operations have the following characteristics:

   - Severely deteriorated infrastructure for water supply and wastewater collection;
   - Very limited wastewater treatment;
   - High operations and maintenance costs due to the deteriorated state of this infrastructure;
   - Unreliable water supply;
   - Manual water storage in households (e.g., in bathtubs and buckets) when water is available;
   - Outbreaks of waterborne diseases, especially during the summer;
   - Low institutional capacity to manage operationally and financially sustainable water supply services;
   - Irrigation and hydropower are the major users of water in Kyrgyzstan, with irrigation accounting for over 90% of water withdrawals.

2. Though municipal water use only makes up 10% of withdrawals, a reliable supply of potable water is, of crucial importance to the health and wellbeing of urban populations. In view of this, ensuring climate resilience of municipal water supplies is an essential element in a comprehensive program of adaptation to climate change for any country. In particular, ensuring that climate change adaptation is mainstreamed in development projects, such as those that the EBRD is currently undertaking in the municipal water sector in Kyrgyzstan, is one of the explicit aims of the SCCF[1]. Climate resilience of irrigation is covered by agencies other than the EBRD in several ongoing projects (see Annex 2). In this project the EBRD focuses on municipal water services.

3. Services that were once readily available are now often intermittent, including the provision of drinking water, wastewater treatment and solid waste collection. Furthermore, the decline in the quality of these services has now created serious public health risks. The civil unrest that erupted in 2010 highlighted the need to strengthen the delivery of basic communal services in local communities as a way of alleviating social tensions.

4. Local governments are responsible for delivering these services and ensuring the necessary infrastructure, and the institutional model differs by city. In the City of Talas, the Talas Communal Services Company is a public utility wholly owned by the City of Talas and services the City of Talas with water and wastewater, solid waste and street cleaning services. In Bishkek, the Bishkek Water Company ("Bishkekvodokanal" or "BVK") is the municipal enterprise serving the City of Bishkek and surrounding rural areas. The BVK provides potable water supply for domestic, commercial and public sector customers and collects and treats wastewater. Most cities have severely limited capacity due to a lack of available fiscal resources and managerial weaknesses of their utilities. At the same time, water users face severe affordability constraints making dramatic increases in tariffs untenable.

5. All forms of monitoring – hydrological, meteorological, snow and glacier monitoring – have decreased sharply since the collapse of the Soviet Union, although efforts are ongoing to restore these systems. Early warning networks in general do not function, and those that do are not adapted to the needs of the new economic and local government agencies. The population has minimal access to the early warning systems and often is not aware of them.[2]

[1] See: Accessing resources under the Special Climate Change Fund, The GEF, May 2011. Available at: http://www.thegef.org/gef/sites/thegef.org/files/publication/23470_SCCF.pdf

[2] Source: Summary: Review of the current situation and preliminary recommendations for actions to adapt to climate change in the Chu-Talas basin, "Promoting Cooperation to Adapt to Climate Change in the Chu-Talas Basin" Kazakhstan and Kyrgyzstan), UNDP-UNECE Project under the "Environment and Security" Initiative,

Figure 1. Map of Kyrgyzstan noting the location of participating cities

1.2 Climate change and the water sector

6. Kyrgyzstan is one of the most vulnerable countries to climate change in the EBRD region. Kyrgyzstan's Second National Communication (SNC)[3] identified impacts on water resources as one of the most severe climate change risks facing the country. As noted in the SNC, vulnerability assessments have been conducted on glaciers and volume of surface water-flow in the Kyrgyzstan territory using models developed by the Institute of Water Problems and Hydro-power Engineering of the Kyrgyz Republic National Academy of Sciences. While Kyrgyzstan has over 8,000 glaciers that supply 30% of Central Asia's total water resources, the area of these glaciers could be reduced by 64% to 95% by the end of the 21st century. In the short- to medium-term, glacial melting would lead to increased river flows, likely increased availability of groundwater, and an increased risk of river flooding, a higher water table, mudflows, avalanches and glacial lake outbursts. In the longer term, as glaciers decrease, glacial water would contribute less to river flows and less to groundwater recharge.

7. It is important to note that averaged readings of annual precipitation total in all climatic regions are comparable: North-western region – 456 mm; North-eastern region – 421 mm; and South-western region – 521 mm; making most of the country a semi-desert. It is unclear how climate change will impact these annual precipitation totals and the distribution within the year.[4]

2011. Available at: http://centralasia.iwlearn.org/publications/projectdocuments/regional-component/chu-talas-analysis-summary

[3] Government of Kyrgyzstan (2009) Second National Communication to the UNFCCC.

[4] Ibid.

8. Assessments and modelling of climate change impacts on surface water-flow have also been undertaken under the SNC. After an increase in surface water-flow expected during the period of 2020-2025 due to an increase from the glacial component, a reduction of flow of between 43.6 to 88.4% from volume of flow in 2000 is anticipated. Indeed, all probable climate scenarios project net decreases in surface water flows. Consequences of the significant reduction of surface water flow that is predicted will have an effect on the economic activities and living conditions in Kyrgyzstan and in neighbouring countries. There is significant interaction between groundwater and surface water in mountainous areas meaning that threats to surface water would also likely impact groundwater supplies.[5] As such, the SNC notes the importance of taking adaptive measures to safeguard the basic consumers of water resources in Kyrgyzstan and neighbouring states.

9. In the cities that will be focused on for investments in this project, the main source of municipal drinking water is from groundwater resources. At the moment, there is a knowledge gap between anticipated climate change and its impacts on groundwater resources in Kyrgyzstan and, while information exists on expected climate change impacts on surface water, it is difficult to determine what are the specific implications for groundwater in each participating city. The current status of monitoring of underground water resources is not sufficient to allow a sound analysis of the effects of climate change on this resource.

10. The main sources of groundwater recharge are from local precipitation, glacial melting and surface water flows becoming groundwater. In regions with relatively arid climates or high topographic relief – such as Kyrgyzstan, the climate (temperature and precipitation) usually controls the rate of recharge of groundwater resources.[6] Given the existing relatively low levels of precipitation throughout most of the country and the expected reduction in recharge due to glaciers, there may be significant medium-term risks of shortages if demand for municipal water outstrips recharge rates.

11. Specific climate change vulnerabilities therefore may include:

    - Long term reductions due to glacial melting: The predicted disappearance of many of the local glaciers combined with low levels of precipitation may result in shortages of ground-water.
    - Changes in groundwater recharge flows: The changes due to the disappearance of glaciers, changing snow-pack melting patterns, and changing surface water patterns will likely have an impact on recharge flows.
    - Seasonal shortages: Longer droughts (during the summer) are expected to pose a challenge to the water supply, as groundwater recharge will be reduced, and more demand for water can be expected during this period. On the other hand, an increase in winter precipitation will produce higher winter flows, which combined with a decrease in glacial/snow storage, will cause a further reduction in freshwater availability during low-flow periods, as in the summer.

12. To better understand climate change impacts on groundwater in Kyrgyzstan over the long term, additional analysis is necessary on particular cities and their particular sources of water. This is critical to ensuring that any investments in the municipal water infrastructure are resilient to climate change impacts.

13. It is also worth noting that the main water sources for most rivers in Kyrgyzstan are the seasonal snowpack in the mountains and melting of glaciers. Groundwater flows (which are also fed by snowpack and glacial melting) and wastewater from municipalities also feed into the rivers. Estimates of total annual surface runoff show an initial increase, as water stored in the glaciers is added to normal runoff, followed by a decrease after the glaciers are gone. After the initial boost due to glacier melting the reduction of surface water flow is expected to be mainly due to increased evaporation as a result of the higher temperatures, and thus is not dependent on the highly uncertain predictions for precipitation change.

[5] Talas River Basin Plan
[6] Sanford, R. (2002) Recharge and groundwater models: an overview. Hydrogeology Journal. 10:110-120.

14. Overall, these water resources are needed to ensure drinking water supplies for the population, water for agriculture and hydropower, as well as to maintain the biodiversity in Kyrgyzstan and in downstream countries that depend on water originating in Kyrgyzstan, such as Kazakhstan.

15. Also related to water resources – but not for drinking water supplies – is the risk of damage to infrastructure from flooding. In spring and summer, during the snowmelt and at times of torrential rains, dangerous floods and mudflows can occur on the mountain rivers. Within cities, flooding can cause serious damage to the wastewater systems.

16. Another aspect of water resources management in Kyrgyzstan is irrigation and hydropower. Kyrgyzstan depends largely on hydropower assets for energy production, although it also imports energy from neighbouring countries. Installed hydropower capacity is almost 3000 MW, and planned capacity is over 4500 MW[7]. The downstream countries of Uzbekistan and Kazakhstan are dependent on Kyrgyzstan for reliable quantity and quality of water, and for the release of water from reservoirs in summer for irrigation purposes. In the political economy of cooperation with its neighbours, hydropower development in Kyrgyzstan will thus affect the cooperative regime in the basin by increasing hydropower generation in the winter months, at the price of reducing the amount of water stored for summer irrigation downstream.

17. If climate change increases water scarcity in the region, as is expected to happen, this could cause tension with downstream countries over the allocation of water resources. Increased water efficiency and reduced pollution will ease pressure on the resource and make it easier for Kyrgyzstan to work with its neighbours to resolve tensions that arise.

18. Kyrgyzstan's neighbours are tackling similar challenges to those addressed by this project. For example, in Tajikistan, which shares the Ferghana Valley with Kyrgyzstan and Uzbekistan, a SCCF project endorsed in 2012 aims at "Increasing climate resilience through drinking water rehabilitation in North Tajikistan". This project will improve the climate resilience of drinking water supplies in seven cities in Northern Tajikistan by a) encouraging water use efficiency, b) establishing more reliable and climate resilient water sources and rehabilitating water supply infrastructure, and c) reforming water utility management including tariff reform, leading to more sustainable supplies of safe drinking water that are resilient to the expected impacts of climate change, and are environmentally and financially sustainable.

1.3 Baseline projects

19. The EBRD began working on water projects in Kyrgyzstan in 2009, signing the first EBRD Municipal and Environment Infrastructure (MEI) project in the country – *the Bishkek Water Project* – which is now under implementation. Under the project, the Swiss Government and the EBRD have provided EUR 11.8 million to improve the water supply in Bishkek. Specifically, the project is financed by a grant of EUR 5.7 million from the Swiss Government and a EUR 5.5 million sovereign loan from the EBRD. The project has enabled the Bank to make progress with water tariff reforms, meeting IFRS accounting standards and promoting efficiency in the Bishkek water company.

20. Despite the difficult domestic situation following the events in April and June 2010, the Bank continued the implementation of the municipal water project and the preparation of projects in urban transport and solid waste in Bishkek. The EBRD then participated in a post-conflict Joint Economic Assessment (JEA) in Kyrgyzstan in cooperation with the World Bank, the Asian Development Bank and the United Nations. A review of the infrastructure upgrade needs throughout the country was made, and the IFIs established coordination to ensure that needs were addressed and gaps or overlaps were avoided.

21. The EBRD developed a *Water and Wastewater Framework*, amounting to EUR 20 million, that comprises water and wastewater projects throughout the country. This Framework streamlines the EBRD approval process for sub-projects in water and wastewater. In May 2011, the Bank signed

[7] Granit et al. (2012): Regional options for addressing the water, energy and food nexus in Central Asia and the Aral Sea Basin, International Journal of Water Resources Development, 28:3, 419-432

the first two water/ wastewater projects under the framework for Osh and Jalalabad. The Framework is now almost fully subscribed (with project under preparation) and the EBRD is considering extending the facility with another EUR 20 million to co-finance priority water and wastewater rehabilitation projects across Kyrgyzstan with international donors. Sub-projects under the Framework are sovereign loans on-lent to the cities, for the benefit of the water companies and would address urgently needed water and wastewater infrastructure rehabilitation needs.

22. The overall objective of the EBRD's investment program in Kyrgyzstan's water sector is to rehabilitate the water supply infrastructure in additional cities under the Framework. The EBRD has several water/wastewater projects under implementation or in preparation (see Table 1 for a list of areas and cities, and Table 2 for details on project signed and under implementation). This investment program is, therefore, considered the baseline project, which is defined as all project activities currently funded and not associated co-investment from the SCCF.

Table 1. Kyrgyz cities where the EBRD is implementing or planning water/wastewater projects

Area	Cities
Chu river basin (flowing into Kazakhstan)	• Bishkek • Kant • Karabalta • Tokmok
Talas river watershed (flowing into Kazakhstan)	• Talas
Ferghana valley (Syr-darya river basin)	• Osh • Jalalabad • Batken
Naryn river (Syr-darya river basin)	• Naryn

Table 2. EBRD projects in Kyrgyzstan that have been signed and are under implementation

Project	Loan (EUR)	Grant provider	Grant amount (EUR)	TC amount (EUR)	Total project (EUR)	Status
Bishkek Water – Phase I	5.5 m	SECO	5.0 m	1.4 m	11.9 m	Estimated completion late 2013
Osh Water and Wastewater	3.0 m	SECO	4.3 m	1.5 m	8.8 m	Estimated completion mid-2014
Jalalabad Water and Wastewater	3.0 m	SECO	4.1 m	1.5 m	8.6 m	Estimated completion mid-2014
Karabalta Water	2.0 m	EBRD SSF	3.0 m	1.4 m	4.4 m	Estimated completion mid-2015

1.4 Problem and barriers

1.4.1 Problems addressed by the Project

23. Strategic water resources in the Kyrgyz Republic are vulnerable to climate change, and the baseline investments, technical assistance and capacity building activities do not explicitly address the vulnerabilities due to climate change. Already there is evidence of a trend towards rising average surface temperatures, with slightly increased precipitation in the north and decreased precipitation in the centre of the country. By the 2050s, summer temperatures are expected to rise by approximately 3 C to 3.5 C, and average winter temperatures by 3 C. Summer

precipitation is generally projected to decrease over the whole country, with the greatest decreases (up to 15%) anticipated in the southwest of Kyrgyzstan. Glacial melt will contribute temporarily to increased river flows, flooding and glacial lake outbursts, whereas the water level of the largest lake in the country is declining. It should also be highlighted that surface and underground waters of the intermountain valleys and, in particular, of the Talas River Basin, are closely linked. Underground waters are mostly formed by the under-channel inflow of mountain rivers and filtration losses of the irrigation water withdrawn from the same mountain rivers. The underground water flow reaches the discharge zone, where a considerable part of the underground water appears on the surface into natural small ravines and drainage network.[8]

24. The state of the current water infrastructure increases Kyrgyzstan's vulnerability to these climate change risks. As identified in the SNC, there is a lack of modern, effective water distribution systems that reduce waster losses, and few incentives for water-users to use available water resources efficiently. This is especially critical during summer months when water availability is projected to drop precipitously while demand peaks due to climate change.

25. The root causes of the problems noted above lie in the neglected and under-invested infrastructure of the water supply systems in Kyrgyzstan, the poor condition of which makes the population extremely vulnerable to the projected impacts of climate change. Under-investment in infrastructure has led to a situation where water is wasted, yet at the same time drinking water is obtained from sources highly vulnerable to climate change. Thus, the drinking water supply in general is highly vulnerable to climate change.

26. Wastewater treatment infrastructure may either exacerbate problems resulting from climate change or ameliorate them. A well maintained wastewater collection system combined with wastewater treatment plants whose effluents are of good quality enables conservation of water quality both locally and downstream. A leaky wastewater system and insufficient treatment, either by a non-functioning treatment plant or by collection of wastewater in septic tanks or latrines, will pollute both local and downstream water sources. As water scarcity increases, this pollution will have a higher impact. In addition, wastewater systems that are badly designed or badly maintained will form a significant risk in case of climate change induced floods.

27. Baseline activities will address some of the issues related to these inefficiencies, yet further, business-as-usual investments in water supply rehabilitation would not factor-in climate change considerations and adaptation options. Standard investments would likely provide an inadequate response to the forecasted climate-driven pressure on water supplies in the coming decades, as they would not explicitly take into account climate change risks and projected changes in water demand/supply due to climate change.

28. The main identified barriers to addressing the root causes and associated risks are the following:

- *Information and awareness barriers* – Low awareness and lack of specific and timely information on risks and vulnerability related to climate change, and on climate risk reduction processes at the national and local levels.
- *Technical barriers* – Current plans and investments do not consider the long-term implications of climate change, therefore, the design of infrastructure overlooks climate change-related limitations and impacts. Limited technical knowledge of available adaptation approaches and technologies, in particular water regulation and possible alternative climate-resilient sources of drinking water, result in infrastructure that is highly vulnerable and communities that lack the resiliency to respond to climatic stressors.
- *Institutional barriers* – There is low institutional capacity to integrate adaptation and climate change risk reduction into water management by water companies and city authorities. The current system of water governance and management is too inflexible to accommodate competing demands of water users and is insensitive to the risks posed by climate change. Authorities lack adaptive planning capacity, timely inputs on climate change; and feedback on experiences from cities facing similar situations. Community involvement in water

[8] Talas River Basin Plan

governance is low, including a low awareness of climate issues related to urban water supply and infrastructure.

29. Activities in this project will be of two types: (1) capacity building, intensive technical cooperation, and awareness raising; and (2) targeted investment interventions. Participation in capacity building and awareness raising activities will be open to all cities in the country and particularly focused on cities in which the EBRD is active. Intensive technical cooperation will be oriented towards cities in certain river basins. Targeted investment interventions will be made in two cities that have been evaluated as being vulnerable to climate change: Talas and Bishkek (where activities will be in addition to the EBRD water and wastewater project in Bishkek begun in 2009). Additional eligibility criteria for participation include:

- The water utility's ability to honour existing and new financial obligations;
- Willingness of the key local authorities to enter into a Project Support Agreement to support the sub-project;
- Willingness of the company and local authorities to implement transition objectives; and
- Confirmation of the Ministry of Finance's willingness to use sovereign debt capacity for the project.

1.4.2 Problems and barriers in Bishkek – in the Chu River Basin

Population information

30. A number of municipalities to be targeted for this project – particularly the capital Bishkek – are in the Chu river basin. In total, there are ~1.675 million people living in the Chu river basin in Kyrgyzstan and an additional 420,000 people living in Kazakhstan in the river basin.[9]

31. Bishkek is currently experiencing waves of internal migration. Large numbers of inhabitants from other regions of the Kyrgyz Republic are moving and settling in Bishkek. This creates a complex demographic situation as well as providing significant uncertainties to municipal utilities operating in the city. In the Bishkek immediate area alone there are an estimated 1.2 million people – a size which is growing every year by ~1 – 1.5%.[10] By 2023 the estimated population of Bishkek will be ~1.57 million.

Water resources

32. Bishkek's climate is continental and has a low average rainfall of approximately 450 mm/year. Rivers in the Chu basin drain the Alatau range of the Tien Shan Mountains south of Bishkek, flowing northwards, from Kyrgyzstan into Kazakhstan. The river has resources of about 6.64 billion m^3 annually. [11] In Kazakhstan the entire surface runoff is diverted into their irrigation system. Groundwater resources are not well quantified for most city sources.

Expected climate change impacts

33. According to estimates of ice amounts in the Chu river basin, in the year 2000, glaciers were at 80% of their historic (1960's) volume. [12] By 2025 most of the glaciers are expected to be gone. Change in surface runoff is expected to be more rapid than in other water basins in the Kyrgyz Republic due to a more rapid melting of the glaciers.

Water production

34. The water supply for Bishkek is obtained mainly from relatively deep underground sources (the pumping head at production sites is 150 meters) and is of good quality with little treatment needed to make it potable. In 2007, 308,000 m^3/day, which is about 60 per cent of the total capacity of boreholes, were abstracted and treated daily.

[9] Sahvaeva, E. (2008) The Chu and Talas River Basins and Climate Change. Presentation.
[10] COWI (2008) Kyrgyz Republic, Bishkek Water Project Technical and Financial Due Diligence Report.
[11] Sahvaeva, E. (2008) The Chu and Talas River Basins and Climate Change. Presentation.
[12] Government of Kyrgyzstan (2009) Second National Communication to the UNFCCC.

35. Existing water sources are groundwater from boreholes distributed in 30 well fields. The main well field, "Orto-Alysh", produced 38% of the total production and is situated in a valley at the foothills of the Kyrgyz Mountain range. No settlements are allowed upstream of the well field area. There are a number of infiltration ponds fed from mountain streams within the well field.

36. It is not known what recharge levels exist for the water fields used by Bishkek. However, population growth (especially in Bishkek) combined with a lack of recharge from glacial melting may put pressure on groundwater resources.

Water demand

37. Water demand decreased after the collapse of the Soviet Union. Based on various forecasts, taking into account national socio-economic development, the restoration of water consumption in the Chu river basin to the levels of 1990 is expected between 2010 and 2020. A gradual increase in water scarcity is forecasted due to increasing demand for water.

38. The Bishkek Water Company draws ~115 million m^3 per year for drinking water purposes, of which 25% is lost in leakage and 8.25% is for the company's own usage. It is estimated that there are ~960,000 water users representing 80% of the city's population.

39. Average consumption is estimated at 106 L per capita per day, which seems relatively low. However, consumption varies widely as large discrepancies in living conditions exist with respect to water supply facilities. Some households have good access to water and others do not. The actual water consumption is difficult to know as almost no water metering is in place and water audit statements are inadequate. Where meter readings are available the average consumption is 210 L per capita per day. These readings are of limited relevance as meters are installed in very few, more affluent households and areas.

40. The population that is served by the water system is expected to grow from 960,000 today to 1.3 million by 2023.[13] If the amount of water drawn increases linearly with the expected population increase, this would mean an extra 40 million m^3 (up to 155 million m^3) would be needed to serve the population in 2023 – if no efficiency improvements are made. Beyond 2023, these numbers would continue to increase.

41. Therefore, planning and implementing preventive measures aimed at protecting and managing surface and groundwater resources in this river basin is necessary.

Wastewater collection

42. Currently, the majority of households (~840,000 people) are connected to the wastewater system in Bishkek. About 75% of resident population in apartment buildings are covered by centralised wastewater removal services and this share is assumed to increase to 85% in 2017 and 93% in 2023. The situation in individual private housing stock is different as coverage is very low. The estimated share of the residential population covered with such services is about 10%. The rest of the population in private housing utilises non-centralised wastewater systems, such as septic tanks and ventilated pit latrines (with or without infiltration). The water from these systems is removed by BVK and transported to the wastewater treatment plant. It is probable that extreme weather conditions linked to climate change will put stress on the wastewater system. A separate storm water collection system discharges directly to the River Chu without treatment.

1.4.3 Problems and barriers in Talas City – in the Talas River Basin

Population information

43. Talas, located within the Talas river basin, has been identified as particularly vulnerable to the impacts of climate change. The Talas River also flows into Kazakhstan, where it is used primarily for agricultural irrigation. There are ~200,000 people living in Kyrgyzstan within the basin[14] – of

[13] COWI (2008) Kyrgyz Republic, Bishkek Water Project Technical and Financial Due Diligence Report.
[14] Sahvaeva, E. (2008) The Chu and Talas River Basins and Climate Change. Presentation.

which ~45,000 people live in the city of Talas.[15] The population is growing by ~1.9% per year due to an influx of people from rural areas. By 2023, it is expected that there will be over 55,000 people living in the city.

Water resources

44. The Talas river basin has ~1.68 billion m^3 available each year.[16] The Talas River and its tributaries receive most of its water from melt water of the seasonal snows, high mountain snowfields and glaciers. The share of return and interflow ground water is about 20% of the flow (i.e. 260 million m^3).[17] The town of Talas obtains its water resources from 3 boreholes to the east of the town. There are no systemic observations over the status and dynamics of ground waters in the Talas River Basin. Many monitoring wells are non-operational, while responsibility for others was shifted to the respective agencies. The level of precipitation is very low in the city (~200-300 mm annually), and in the region in general, as it is in a semi-desert area. Population growth due to migration from the countryside into the cities, combined with a lack of recharge from glacial melting and increased demand due to higher rates of connections to the water system may put pressure on groundwater resources.

45. The water supply and wastewater systems of the City of Talas have experienced a progressive deterioration during the years that followed the decline of the Former Soviet Union, mainly due to a substantial lack of capability to raise funds for operation and maintenance. Large areas of the city are not served by the water supply system. The sewerage system is worse still, resulting in major problems of collection and disposal of waste water causing widespread street level pollution.

Estimates of expected climate change

46. The situation in the Talas river basin is similar to that described above for the Chu river basin. In 2000, glaciers were at 63% of their historic (1960's) volume in the Talas river basin.[18] In all scenarios that maintain the current level of precipitation the glaciers in the Talas river basin will disappear completely by 2050. While the level of precipitation is not expected to drop dramatically, it is already quite low. Seasonal variations could also strain water resources especially in summer. Increasing frequency of extreme events may also cause damage to infrastructure, especially wastewater infrastructure.

Water production

47. The Talas water supply is fed from both deep boreholes and a shallow drain/infiltration gallery to the east of the city. In addition to this, there are two 1000 m^3 reservoirs at the head works to which the pumped water is discharged. The city currently draws ~4.8 million m^3 per year for use – almost 25% of the entire demand for drinking water in the basin. Any water that is leaked or goes into the waste stream is likely unusable again because the location of the users is down-stream from the sources.

Water demand

48. Approximately 1.2 million m^3 of the ~4.8 million m^3 pumped by the city is accounted for by end-users (885,000 m^3 for the general population – estimated by using norms as opposed to meters). Therefore almost 75% is lost through leaks, lost through over-use by consumers (which is not paid for because there are no meters), or used by the utility. It is estimated that there are ~21,000 individuals using the water systems (47% of the town).

49. In the coming decades, it can be expected that the number of users would increase due to population growth and therefore the demand would increase as well. By 2023, if the population increases at 1.9% per year as expected and the percentage of the town connected to the water

[15] Grontmij and RAM Engas (2012) Kyrgyz Republic Talas Water and Wastewater – Feasibility Study
[16] Talas Basin Water Plan
[17] According to the Kyrgyzsuudolbor Institute.
[18] Sahvaeva, E. (2008) The Chu and Talas River Basins and Climate Change. Presentation.

system increases to 63%, the total consumption would almost double – from 885,000 m^3 to 1,610,000 m^3. If no efficiency improvements are made, the total amount of water needed to be drawn to supply Talas would increase from ~4.8 million m^3 per year to ~7.6 million m^3 per year. Beyond 2023, these numbers would continue to increase.

Wastewater

50. Currently relatively few of households are connected to the wastewater system in Talas (perhaps 4,000). Analysis of the system indicates that it is probable that extreme weather conditions linked to climate change will put stress on the wastewater system.

51. In particular, increased surface flooding can occur by a combination of increased precipitation intensities (extreme events), together with increased snowmelt. The Talas River receives most of its water from snowmelt runoff. In the near term, climate change may cause enhanced melting of glaciers and snow in the mountains, increasing the base flow of the river, and hence the risk of floods. Increased extreme rainfall events in summer may combine with the higher base flow in the river to pose a risk of surface flooding in Talas city. Further, if the sewer system is not designed to cope with significant peak rainfall intensity, the risks of flooding will be increased. Floods may damage infrastructure such as roads, rainwater concrete channels (which are distributed all over the city), energy transformers (located near the ground throughout the city), wastewater treatment plant, residential areas etc. In addition, floods represent a risk for the contamination of water supplies, as fecal contamination might find its way to the water supply from leaks in the wastewater system.

1.4.4 Activities in the city of Kant

52. The city of Kant was included in the indicative list of participating cities in the Project Identification Form (PIF) for SCCF funds. After submission of the PIF, in September 2012, the final report of the Kant Water and Wastewater Project Feasibility Study was published.

53. It was decided to that focusing SCCF resources for investment on Bishkek and not focusing SCCF investment resources in Kant would be more effective and impact more people/ have a larger impact on the basin. This is because Bishkek is by far the biggest urban area in the Chu watershed, in which Kant is also situated. Full co-financing of the Kant Water and Wastewater Project, including climate adaptation aspects of the project, has also been confirmed by the EU.

54. In view of these conclusions it was determined that investments in Kant city will not be included in the SCCF funding request for Kyrgyzstan.

2 Project design

55. The section below outlines the project including the baseline, the adaptation alternative and the additionality to be brought to the project due to the SCCF's intervention. This additionality lies in assisting Kyrgyzstan in adapting to climate change.

2.1 Summary of key features of the Project

56. The **project's objective** is as follows:

> "To improve the climate resiliency of water supply in cities in the Kyrgyz Republic by fully mainstreaming climate change considerations into water infrastructure rehabilitation."

57. **Project approach:** To meet the proposed project objective, the following outcomes are sought:

1. Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas
2. Decreased water demand and improved climate resilient supply of drinking water, reducing pressure on climate-vulnerable water resources;
3. Institutional capacity developed and governance of water companies and city authorities strengthened for integrating climate change impacts into water resources management; and
4. Increased community involvement in water governance and awareness of climate issues in water governance.

58. **Project structure:** The Project is composed of several interrelated components:

- **Component 1,** Integrating climate change assessments into the design and appraisal of water infrastructure;
- **Component 2,** Building in additional climate-resiliency features in water infrastructure rehabilitation projects;
- **Component 3,** Increasing capacity for water governance;
- **Component 4,** Increasing community involvement in water governance and raising knowledge and awareness of climate change implications among water users.

2.2 Component 1: Integrating climate change assessments into the design and appraisal of water infrastructure

Outcome 1: Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas

2.2.1 Baseline

59. Currently, as noted above, the EBRD's investment program in the water sector in Kyrgyzstan involves the rehabilitation of the water supply infrastructure in cities under the *Water and Wastewater Framework.* As part of this work, the EBRD is conducting feasibility studies and other assessments for water and wastewater projects throughout the country. The objective of this feasibility work is to develop affordable least cost and cost-effective bankable priority investment programmes for water infrastructure to rehabilitate and increase the efficiency of the existing system with strong social and environmental benefits. A secondary objective is to identify costs and recommend financing and implementations timing, taking into account existing affordability and public debt constraints in the country. Baseline tasks typically include: baseline studies to assess current conditions of water and wastewater management and prepare technical, environmental and social audits of current water supply and wastewater facilities; preparation of financial projections; development of long-term investment programmes; preparation of priority investment programme; and environmental and social due diligence.

60. The potential impacts of climate change, however, are not currently incorporated into future resource planning. This is the case for both the EBRD's studies and the assessments carried out by the cities themselves. Overall, there is a lack of understanding of the impacts of climate change on water resources. As such, there is no systematic consideration of climate change impacts in future water infrastructure project design and appraisal.

2.2.2 Adaptation alternative

61. The intervention by the SCCF in this component focuses on understanding climate change impacts on water resource supply and demand, and on the related economic and institutional implications. This information provides a foundation for adaptation planning, as the consideration of the impacts of climate change will be systematically incorporated into water infrastructure project design and appraisal. Further, this information provides a foundation for informed decision-making by key stakeholders and thereby helps to ensure that future water infrastructure projects are climate resilient. The project will focus on increasing adaptive capacity in key urban areas to improve responses to the impacts of climate change, including variability, by increasing knowledge and understanding of climate variability and change-induced risks at the country level and their implications for water infrastructure. Current climatic conditions as well as projected climate change will be taken into account, in so far as they have the potential to affect water supply and wastewater discharges.

62. The information network for participating cities to be set up under Activity 3.3 will be used to disseminate the studies produced in this Component on water resources and of the methodology for designing and appraising water infrastructure projects.

Outcome indicator(s):	**Baseline Value**	**Target by End of Project**
Relevant risk information disseminated to stakeholders	No	Yes

Activity 1.1: Conducting risk and vulnerability assessments

63. The project will prepare up-to-date risk and vulnerability assessments for the two primary participating cities which are still in the project preparation phase (i.e. Naryn, Batken and Tokmok). These assessments will be incorporated into feasibility studies for new water investments planned by the EBRD in these cities. This will include preparing risk and vulnerability assessment data for the participating cities, covering specific points where infrastructure and users are vulnerable to climate change.

64. These studies will identify the potential impacts of climate change on the water infrastructure in each city in order to enable the development of options building in resilience to climate change risks. The baseline should take account of the current climatic conditions and projected climate change in so far as they affect water supply and waste water discharges. The studies will assess the risk associated with projected climate change, and will include:

- Climate change impacts: a compilation of readily available data from reliable resources on existing climate conditions and future climate projections;
- An analysis of the collated data to determine the risks associated with climate change, while advising on the level of confidence associated with climate change projections and the implications for the project. This will include analysis of currently utilized water resources (groundwater) and their relative vulnerability to climate change;
- Description and assessment of the key attributes of the current service and the service development over the last 3 years, including climate change vulnerability of services (e.g. disruption due to climatic events and effects on quality of supply);
- Assessment of the cities' water infrastructure and equipment components in terms of capacity, energy, energy efficiency, performance, state of repair, maintenance practices, age, quality of materials and equipment, adequacy, focusing on the vulnerability of infrastructure to climate change (e.g. effects of temperature increase or increased precipitation and glacial flows);

- An assessment of the risks of climate change resulting from the identified vulnerabilities and the climate change projections;
- An assessment of the implications of climate change for overall future regulatory compliance with Kyrgyz and EU environmental requirements, looking also at pollution prevention measures;
- Analysis of the financial consequences of climate change for key income and expenditure variables;
- If a Long Term Investment Plan exists, then the implications of climate change impacts for these investments will be discussed;
- Criteria related to the effects of climate change which will guide later planning and design efforts;
- Proposed investments for adaptation measures to address the risks of climate change, e.g. diversification of water supply sources. These shall be oriented towards building in climate resilience into water supply, operations, services and facilities with the aim of sustaining the service standard in the light of projected climate change;
- Identification of additional studies necessary to address gaps in information on climate change;
- Examination of transboundary implications.

65. This activity will commence as soon as possible after project kick-off, since water and wastewater projects are under preparation for several cities at the moment. The first cities for which risk and vulnerability assessments will be prepared are those for which the water and wastewater projects are still under preparation, since for these cities the largest impact will be possible by taking the results of the assessment into account when finalising project preparation. These cities include Naryn, Batken and Tokmok.

Output	**Output Indicator(s)**	**Baseline Value**	**Target by End of Project**
Output 1.1. Risk and vulnerability assessments	Risk and vulnerability assessment conducted	No	Yes

Activity 1.2: Carrying out water resources studies

66. Water resources studies will be undertaken nationally, with a focus on river basin s that are important to municipal water supplies. The studies will detail the impact of climate change on water resource supply and demand, and economic and institutional implications.

67. While the risk and vulnerability assessments conducted in Activity 1.1 will provide valuable and immediate input to water sector projects at a local scale in specific cities, there is a lack of information on water resources in Kyrgyzstan at the national and river basin level and the expected impact of climate change on them. The water resources studies foreseen in this component will generate this information and analyse the economic and institutional implications of this information. River basins that will receive particular attention, due to the existence of significant urban populations in their area, are the Syr-darya river basin and Chu river basin.

68. The primary objective of the water resources studies will be to support Kyrgyzstan in meeting future water demands while conserving water[19]. The studies will obtain the socio-economic and water resources information to enable management of increasingly scarce water resources in an efficient and equitable way. An overview of economic and institutional reforms that promote this goal will be part of the study. The scope of the studies will cover:

    - Review of water resources availability (surface water, groundwater and glaciers), their quality and the anticipated impacts of climate change on availability and quality;

[19] An example of a similar study is the Joint Maputo River Basin Water Resources Study. See: http://www.dwaf.gov.za/maputobasinatlas/JMRBWRS_Atlas.html

- Water demand for all types of water users and the anticipated impacts of climate change on demand;
- Planned development of water infrastructure, particularly dams, and the implications of climate change for the viability of these plans;
- Overview of water resources governance in Kyrgyzstan, including surface water, groundwater and glaciers;
- Overview of institutional arrangements relating to water resources in Kyrgyzstan;
- Review of the approaches taken in neighbouring countries in dealing with the challenges of water management, and specifically changes and improvements to water management put in place to increase climate resiliency;
- Principles underlying good management of water resources;
- Recommended management and development options and suitable institutional and financial arrangements in line with the principles identified and with the aim of increasing climate resilience;
- Concrete actions to implement the recommended options, including identification of the level of authority at which the actions should be taken (i.e. city, oblast or national); and
- Stakeholder and public participation programme.

69. The following information will be generated:

- Report;
- Maps;
- GIS data;
- Georeferenced hydrological data;
- Photos.

70. Due to the lack of data on water resources – particularly groundwater resources – in Kyrgyzstan, it may be necessary to create groundwater resource monitoring systems to provide input to these studies and to support water resource management in future, along the lines to be recommended in the studies. This will be done under Activity 3.2, in which climate monitoring systems will be set up.

71. The information that will be collected and generated during the course of the studies will be made publicly available on the Internet. Studies produced will be disseminated to policy-makers, investors and other stakeholders as appropriate.

Output	**Output Indicator(s)**	**Baseline Value**	**Target by End of Project**
Output 1.2. Detailed water resources system studies	Number of detailed water resources system studies carried out for river basins	0	2

Activity 1.3: Development of design and appraisal methodologies

72. To support the objective of this project of fully mainstreaming climate change consideration into water infrastructure rehabilitation it is important to provide tools that will be useful beyond the duration of the project itself. This Activity will provide one such tool that will enable Kyrgyz municipal and national authorities to incorporate climate change consideration in future projects.

73. A methodology for designing and appraising water infrastructure projects that are climate resilient will be developed. The project will develop a country-appropriate methodology for designing and appraising water infrastructure projects in a way that will ensure that investments are climate resilient.

74. There is a significant existing body of knowledge on designing climate-resilient water infrastructure, or climate-proofing. Climate proofing refers to the explicit consideration and internalization of the risks and opportunities that alternative climate change scenarios are likely to

imply for the design, operation and maintenance of infrastructure[20]. In other words, integrating climate change risks and opportunities into the design, operation, and management of infrastructure.

75. In recent years the EBRD has been building up experience in integrating climate change considerations into its water sector investments. This experience will be supplemented by a focused review of the body of knowledge described above. The aim is to provide those responsible for decisions on the design of Kyrgyz water infrastructure with practical guidance on a streamlined and efficient approach to including the practices developed internationally into local decision-making.

76. A methodology will be developed with as its starting point a general roadmap for climate-resilient water infrastructure. This will include the following steps:

    i) Mapping of present and future climate variability and change risks, over the expected lifetime of the type of infrastructure being considered;
    ii) Mapping of critical water infrastructure that is essential to the functioning of the community, both in routine and extreme emergency circumstances;
    iii) Defining acceptable risk levels. In practice, this might mean identifying the types and duration of service interruptions that can or cannot be accepted;
    iv) Selecting non-structural and structural risk mitigation measures. Non-structural measures are any measures not involving physical construction such as research and assessment, information resources, and public awareness programmes. Structural measures are any physical construction to reduce or avoid possible impacts of hazards, such as flood levees. The potential to generate additional development benefits will be critical in the weighting of regional options.

77. For each of these steps the available information relevant to water infrastructure in Kyrgyzstan will be collected and documented, and guidance will be given on completing the process for specific projects considering local circumstances.

78. These design and appraisal methodologies will also be disseminated to policy-makers, investors, and other stakeholders.

79. A pilot project implementing the methodology under the guidance of the developers will be part of this activity. It is foreseen that the methodology will be ready for use in time for its implementation in Tranche III of the EBRDs Municipal Infrastructure Programme, for which project preparation is to start in 2013 for signing 2014. Batken Water Project is currently pending confirmation under this Tranche. The experience gained in the pilot project will then inform the finalization of the methodology before its wider dissemination.

Output	**Output Indicator(s)**	**Baseline Value**	**Target by End of Project**
Output 1.3. Design and appraisal methodology	Existence of a design and appraisal methodology for carrying out risk and vulnerability assessments	No	Yes

[20] Information on climate proofing was obtained from: United Nations Development Programme (2011). "Paving the Way for Climate-Resilient Infrastructure: Guidance for Practitioners and Planners. New York, New York; United Nations Development Programme.

Table 3. Component 1: SCCF/adaptation relevance and benefits

Activities	Outputs	SCCF and Adaptation Relevance, and Associated Benefits	Other Positive Benefits
Risk and vulnerability assessment	Up-to-date risk and vulnerability assessments for participating cities	Will allow for potential impacts of climate change to be incorporated into future resource planning.	Will allow for reduced impacts on vulnerable populations through adoption of improved planning processes.
Water resources studies	Study detailing impact of climate change on water resource supply and demand, and economic and institutional implications	Will allow for understanding of impact of climate change on water resource supply and demand, and on both economic and institutional implications. This information will provide a foundation for adaptation planning.	Will provide a foundation for informed decision-making.
Design and Appraisal Methodologies	Methodology for designing and appraising water infrastructure projects that are climate resilient	Will allow for systematic consideration of climate change impacts to be incorporated into future water infrastructure project design and appraisal.	Will provide a foundation for future water infrastructure projects to be climate resilient.

2.3 Component 2: Building in additional climate-resiliency features in water infrastructure rehabilitation projects

Outcome 2: Decreased water demand and improved climate resilient supply of drinking water, reducing pressure on climate-vulnerable water resources

2.3.1 Baseline

80. The EBRD has been requested to finance upgrades to the water supply and wastewater systems in cities in Kyrgyzstan. Currently, the water supply services are sub-standard due to lack of maintenance and repair, which has contributed to *ad hoc* water supply and too low pressure in the pipelines to deliver water in many parts of the cities. Wastewater may be collected in septic tanks of buildings, contributing to health issues. The unreliable water supply and sub-standard wastewater collection affects the willingness-to-pay for water and collection rates are low, which also limits possibilities to carry out tariff reform.

81. In response, the EBRD is outlining strategic long-term investment programmes, which include priority environmental and social considerations. Phased approaches will be used to deal with the possibility of further budget constraints due to decreased affordability.

82. The baseline regarding this component is therefore that some limited investment may occur but not take into account vulnerability to climate change.

2.3.2 Adaptation alternative

83. The adaptation alternative for Component 2 is to be financed by the EBRD, the SCCF and other donors via the EBRD. It targets water infrastructure rehabilitation in two Kyrgyz cities, with the aim of implementing projects over the next two years that will lead to climate change risk resistant infrastructure and practices. The problems in the water and wastewater sector will be addressed through relatively small but well-designed projects. This approach aims to achieve maximum impact under existing affordability and public debt constraints in the country.

84. This project component focuses on building in additional climate-resiliency features in water infrastructure rehabilitation projects. The intent is to improve the efficiency of both water use and supply, thereby reducing the vulnerability of drinking water supplies to climate change.

85. The SCCF additionality to the project design has been informed by the technical feasibility studies regarding specific climate change impacts on groundwater in Kyrgyzstan over the long term for each participating city. Examples of climate change impacts are: long term reductions due to glacial melting; changes in groundwater recharge flows; seasonal shortages.

86. The choice of each intervention is specifically linked to what is understood about the specific climate change vulnerabilities facing the water supplies of the participating cities. The cities involved in this component are Bishkek and Talas.

87. The additional activities include introduction of value-added measures to reduce demand, improve the climate resiliency of municipal water infrastructure (including wastewater). As a result of these project investments, the vulnerability of communities to climate change impacts on drinking water resources will be reduced. Additional anticipated benefits include reduced resource wastage and quantitative values of water use leading to increased public awareness of water use issues; reduced operating costs for utilities; increased transparency of billing system and associated increases in willingness-to-pay and predictability of revenue stream; increased efficiency and reliability of water supply reduces climate vulnerability; reduced operating costs for utilities and increased quality of service and reduced potential for source contamination and potential for safe use of treated water.

88. **Tranche I projects:** In addition to the baseline projects, which are already under implementation, Tranche I projects have been prepared (see Table 4 for details). Signing is pending grant co-financing confirmation, in particular from IFCA – which will be cofinanciers of the projects via the EBRD: EUR 1.85 million is expected from IFCA and USD 3 million (EUR 2.3 million) is expected from the SCCF for activities specifically related to adaptation to climate change.

Table 4. Tranche I projects

Project	Loan (EUR)	Grant provider	Grant amount (EUR)	TC amount (EUR)	Total project (EUR)	Status
Talas Water and Wastewater	2.0 m	IFCA (EUR 1.85m) and SCCF (EUR 1.15m) (tbc)	3.0	0.88 m	5.88 m	Project fully prepared. Signing pending grant approval, expected Q1 2013
Kant Water	1.5 m	SECO	3.62 m	0.76 m	5.88 m	Project fully prepared. Scheduled to sign Q1 2013
Bishkek Water II	5.0 m	SCCF (EUR 1.15 m) SECO (tbc)	5.0 m	0.8 m	10.8 m	Project preparation ongoing, can sign late 2013

89. **Tranche II projects** for the period 2013-2014 are under preparation and are expected to be ready for implementation in early 2013. They are anticipated to be carried out in the following cities:

- Tokmok;
- Osh;
- Naryn.

90. Tranche III is being considered for the city of Batken – to be ready for implementation in 2014.

91. Although all of these cities will benefit from the activities in the proposed SCCF project, two cities have been chosen for investment by the SCCF in specific adaptation-related investments: Bishkek and Talas.

2.3.2.1 Bishkek water Phase II (Tranche I)

92. Bishkek is the capital of Kyrgyzstan, with a population estimated in the range of 1-1.2 million. The city is located at the northern pre-mountain slope of the Kyrgyz Range of the Northern Tien Shan mountain system. The topography of the city itself is relatively flat.

93. The EBRD is working with the Government of Kyrgyzstan, the City of Bishkek and the Bishkek Water Company (Bishkek-vodokanal, BVK) to improve the municipal water supply service of the Kyrgyz capital. Bishkek-vodokanal is the municipal enterprise, wholly owned by the City, charged with the production and distribution of potable water and the collection and treatment of wastewater in the City of Bishkek and the surrounding areas, serving 950,000 people and 7,157 industrial, commercial and public sector customers.

Baseline project in Bishkek

94. As a part of the baseline, implementation of a priority investment programme (PIP) comprising 6 main investment components was begun at the end of 2011. The total investment volume is some EUR 10.5 million, financed by a EUR 4.886 million loan from the EBRD and a EUR 5.0 million capital grant of the Government of Switzerland via the Swiss State Secretariat for Economic Affairs (SECO) to the Bishkek Water Company. To this is added Technical Cooperation support of EUR 1.4 million. Physical completion is expected by the end of 2014.

95. The following elements are included in this programme:

- Rehabilitation (replacement) of water supply transmission and distribution network;
- Supply and installation of pumps, valves and electrical equipment in existing boreholes;
- Drilling and installation of new boreholes;
- Supply and installation of mains water meters;
- Supply of maintenance and repair machinery;
- Supply and installation of chlorination dosing equipment.

96. The project also includes corporate development of Bishkek Water Company and a Stakeholder Participation Programme. The Company has successfully improved its institutional capacity as well as its capacity in procurement of goods and services according to international standards with the assistance of project consultants.

97. Additional baseline activities include:

- At present the World Bank is investing in the rehabilitation of Bashkara Suu water intake, which is the second largest water intake used by the Company, as well as construction of reservoirs. This investment amounts to USD 8 million on a grant basis. These investments will enable the Company to enlarge the production capacity and further increase revenues, which in turn will improve the debt service capacity. The rehabilitation and construction works were expected to start in September 2012.
- In addition, the World Bank will invest in the elaboration of a comprehensive hydraulic model for the entire network of Bishkek. The preliminary cost of this assignment is USD 600,000. At present a consultant has been selected to develop technical specifications. It is expected that the hydraulic model will be ready by the end of 2013. This would allow identifying the bottlenecks in the system allowing the Company to target maintenance leading to a decrease in the operating costs, which in turn will improve the financial sustainability of the operations.

Adaptation alternative in Bishkek

98. The Priority Investment Programme (PIP) currently being implemented in Bishkek is the first step on the way to a sustained and systematic rehabilitation and renewal of the water and wastewater infrastructure in the City of Bishkek. Due to the success of the project in increasing institutional and technical capacity, as well as the financial position of the Company, the City of Bishkek has asked the EBRD to prepare Phase II to be implemented in parallel with Phase I. It is Phase II to which we propose to add adaptation elements.

99. Phase II would cover additional priority investments that are not covered under the Phase I – particularly those that will lead to better climate resiliency. Partial parallel implementation would yield economies of scale from an implementation perspective. The Phase II PIP would focus on supplementary renovation of the Company's water supply infrastructure and sewage network, including new settlements near the City not covered by Phase I, and could also cover wastewater collection and treatment in the City. Phase II total project costs are currently estimated at EUR 10.8 million. A proposed EBRD loan of EUR 5.0 million would be co-financed by a capital grant of EUR 5.0 million. The Swiss State Secretariat for Economic Affairs (SECO) has indicated an interest for providing a capital grant subject to availability of funds. In addition, the Bank is in on-going discussions with IFCA about a larger grant co-financing arrangement for its municipal water and wastewater projects in Central Asia.

100. Investments in the adaptation alternative are expected to significantly reduce water losses and optimise operating costs for water supply. In addition, Phase II will improve wastewater management in the City and will visibly contribute to an improvement in people's daily lives by eliminating health hazards posed by unreliable water supply and unsanitary wastewater handling – especially resulting from extreme weather conditions – in the City.

101. Initiatives foreseen for Phase II as a baseline to be covered by the EBRD and SECO/IFCA funds include:

- Implementation of tariff reform;
- Improved corporate governance and transparency - mandatory publication of key strategic documents including annual report and annual financial results, mandatory consultations with water users (outside the EBRD supported projects), as well as incorporation of climate change risks;
- Setting standards for staff optimisation.

102. Additional initiatives and investments foreseen for Phase II will explicitly address vulnerability to climate change. Funding is requested from the SCCF for these additional activities and investments:

- Reduction of water losses and energy consumption;
- Metering - while Phase I foresees the full coverage of production metering, Phase II will be extended to include household metering with a coverage of an estimated 10 per cent of households in private residential areas. This is proposed to be partly covered by SCCF investments as it is a key adaptation measure.

103. A detailed description of the specific additional activities to be funded by the SCCF is given in Section 2.3.2.3.

2.3.2.2 The Tranche I project in Talas City

104. With a population of 38,000, Talas is situated 300 km south west of Bishkek close to the border with Kazakhstan on the main east-west highway running through the Talas valley. The City's main industry is agricultural production.

105. The Talas municipal water utility "Talas Taza Suu" (TTS) is owned by the municipality but operates independently. Abstraction of water is permitted by the Water Department of the Ministry of Agriculture and discharge of water is licensed by the Talas Oblast (Regional) Department of the State Agency of the Kyrgyz Republic for Environmental Protection. Major construction projects such as new infrastructure are carried out through the State Committee for Town Planning and Construction. According to the standard process in the Kyrgyz Republic, facilities are subsequently handed over to the TTS upon commissioning. Since the Mayor approves reorganization of the company, staff schedules and budgets, TTS in its daily operation is under the direct influence of the political willingness to subsidise the operations.

Baseline in Talas

106. Without the intervention of the EBRD and SCCF, it is likely that no significant additional investments to address climate change risks would be undertaken in Talas.

Adaptation alternative in Talas

107. The EBRD was approached by the City of Talas in 2011, with a request to provide financing for upgrades and rehabilitation of the City's water supply and wastewater infrastructure. The financing plan for the proposed Talas Water and Wastewater Rehabilitation Project includes an EBRD loan of EUR 2.0 Million, an international donor (capex) grant of EUR 3.0 Million and an additional EUR 1.5 Million from Technical Co-operation (TC) donors to assist in implementation. The EBRD has received preliminary approval from the SCCF for funds to go towards capex investment and TC specifically related to climate change adaptation.

108. Talas's long term objective for its water supply is a sustainable, high quality water supply, efficiently distributed throughout Talas by year 2026. The long term objective for sewerage is a fully developed sanitary sewerage network, efficiently conveying all generated waste water to the Talas Waste Water Treatment Plant (WWTP). The long term objective for wastewater treatment is a fully operational wastewater treatment system, efficiently treating all generated waste water from Talas City in accordance with environmental norms.

109. Taking into consideration the long-term vision for water supply and treatment in Talas, proposals have been made for immediate priorities within a PIP based on requests from the water company and key stakeholders. The investments fall into the following main categories:

- Improvement in water treatment facilities based on condition assessment;
- Provision for waste handling at the treatment plant;
- Minor improvements at the treatment plant to improve basic treatment and resilience.

110. Additional activities and investments, which are critical for addressing climate change risks, are:

- Upgrade and rehabilitation of water network for current and future demand and to reduce losses, mainly equipment purchase. A programme of leak detection will inform network replacement;
- Institutional support including water meters for consumers, meters at supply station, including meters to allow step testing for loss reduction activities within the network, laboratory rehabilitation and equipment, office improvements, equipment and training;
- Rehabilitation and repair of the main sewer.

111. A detailed description of the specific additional activities to be funded by the SCCF is given in Section 2.3.2.3.

Outcome indicator(s):	**Baseline Value**		**Target by End of Project**	
% of targeted groups adopting adaptation technologies by technology type	Female	Male	Female	Male
Bulk and End-user water meters	3%	3%	15%	15%
Leak detection control equipment and repairs	20%	20%	50%	50%
Water and wastewater network replacement and extension (as measured by a percentage of city residents receiving the service)	20%	20%	50%	50%

2.3.2.3 Additional activities to be funded by the SCCF in Bishkek and Talas

Activity 2.1: Implementation of approaches to increase efficiency of water use and reduce climate vulnerability.

112. To increase water use efficiency, new water meters, water saving technologies and meter-based billing are anticipated to be installed in participating cities. This will include installation of water meters at points of delivery, in both domestic and commercial properties. The intent is to increase

transparency of the usage and charging system, and therefore promote reduced demand and resource requirements. Ensuring the climate resilience of new water sources is another element in this Activity. The long list of projects identified for water supply services in Bishkek in addition to the immediate projects under the Priority Improvement Programme included the drilling and installation of new boreholes.

The adaptation effects of these investments are:

Investment	Vulnerability reduction of this investment	Resilience	Adaptation
Water production facilities			
Supply of bulk water meters at water supply source & in network	Water scarcity	Medium	Water conservation, as more control of production of water should help in making better management plans and perhaps schemes for diversification of water supply. Enables accurate water balance, which is of importance in times of water scarcity.
Water Networks			
Supply of domestic water meters	Water scarcity, need for new sources of water	High	Allow establishing schemes for a potential diversification of water supply, at the household level. Water conservation is positively affected, as water consumption per capita can be correctly estimated.

Sub-activity 2.1.1: Implementation of approaches to increase efficiency of water use and reduce climate vulnerability in Talas

113. Investments in the Talas water system have been selected that reduce the risks that climate change poses to the water supply system, and thus increase the climate change resilience of the larger investment programme, considering projected climate changes for the next ca. 10-25 years.

114. The selected investments are:

- **Supply of bulk & domestic water meters –** Almost no metering exists in Talas. Basic and anecdotal reports demonstrate that wastage is very high in Talas due to poor interior and exterior plumbing, cultural and social beliefs that leaving taps open will stop them freezing in winter and the lack of incentive to control the amount of water used. Without the SCCF intervention, the finances available for this investment would be severely limited and likely only cover a few residences. With the SCCF intervention, it is expected that ~6000 units will have meters (making up 90% of the connections). This will assist in saving water resources by likely reducing consumption. The potential reduction in water use with individual metering of dwellings in Talas is 20-30%.

Sub-activity 2.1.2: Implementation of approaches to increase efficiency of water use and reduce climate vulnerability in Bishkek

115. Upon completion of the Feasibility Study for Phase II of the Biskek Water project the selection of additional activities to reduce the vulnerability of the Bishkek water and wastewater system to climate change will be finalized.

116. Phase II investments that are critical to climate change adaptation under this activity are:

- **Household metering** – Less than 3% of household consumption in Bishkek is metered. As a result of a study in which meters were installed in a sample of households it was found that particularly in private houses water consumption levels were far above any normative values, due primarily to excessive use of drinking water for gardening, car wash, inside and outside pools, and other purposes. Therefore, a priority is the installation of water meters in 16.000

private houses in Bishkek – increasing the percentage to ~10%. It is believed that by installing the meters on a fairly large scale, the potential for savings can be demonstrated and consumers will want to purchase them themselves. The potential reduction in water use with individual metering of dwellings for Bishkek is estimated at 20-30%.

Activity 2.2: Rehabilitation of water supply infrastructure

117. The rehabilitation of drinking water supply infrastructure involves the renovation of pumping stations, and improvements to water storage to increase capacity and reduce water losses thereby improving the overall reliability of the water supply. Wastewater-recycling measures are designed and implemented - including wastewater collection and treatment - as effective treatment of wastewater will also reduce water pollution and drinking water contamination. Implementation of water loss reduction measures for distribution systems is another activity.

The adaptation effects of these investments are:

Investment	**Vulnerability reduction of this investment**	**Resilience**	**Adaptation**
Water networks			
Water network replacement (particularly of pipelines with serious leakage) and extension	Reduces risk of the contamination of water supplies in case of flooding. Water scarcity	High	Preparation for extreme weather events. Additional resilience of water quality by new pipes, reducing leakages and increasing pressure in the system. Water conservation.
Leak detection to identify the pipelines with the worst problems, and targeted repairs to the pipelines highlighted by the leak detection.	Reduces risk of the contamination of water supplies in case of flooding. Water scarcity	High	Preparation for extreme weather events, as leaks enable the entrance of pollutants into the water system in case of floods. Water conservation increases resilience to drought, prevents groundwater depletion, and can postpone the need for expansion of water utilities
Wastewater Networks			
Wastewater network replacement and extension, connecting additional houses to the sewer system: improve coverage and eliminate some off-line storage of waste water. May be designed as a pilot study to increase public awareness of the advantages of piped sewerage against the use of on-site sanitation.	Flooding: Increases resilience of network in case of flooding, reducing the chance of floodwaters being contaminated by raw sewage, particularly from flooded cesspits and septic tanks. Groundwater level increase: Septic tanks in the lower part of Talas city are already heavily affected by the ground water level, and any increase would exacerbate this problem, forcing households to construct new tanks frequently.	Medium	Sewers (especially combined sewers) have more limited climate resilience than water mains (WHO, 2010). Effective but still vulnerable in preparation for extreme weather events, especially since Talas main sewer is located close to the surface, so there is potential for manhole surcharges. A complete new design of the sewer system would allow account of the diverse climate change threats.

118. An indirect positive effect of the investments is the minimization of impacts on water resources used for irrigation such as the Talas River. By introducing resilience to water quality in the supply system, from the source to the network, the measures will improve the quality of the river water, by reducing leakage from sewers.

Sub-Activity 2.2.1: Rehabilitation of water supply infrastructure in Talas

119. **Leak detection and repairs –** without the SCCF intervention, the finances available for this investment would be severely limited and likely only cover ~20-30% of the water system (about 1000 m). With the intervention, over 4000 m of the system can be repaired and a leak detection system can be purchased. This investment will aid in preparation for extreme weather events, as leaks enable the entrance of pollutants into the water system in case of floods. Additionally, water conservation increases resilience to drought, prevents groundwater depletion, and can postpone the need for expansion of water utilities.

120. Wastewater network replacement and extension – Sewers (especially combined sewers) have more limited climate resilience than water mains. They can be effective but still vulnerable in preparation for extreme weather events, especially since the main sewer is located close to the surface, so there is potential for manhole surcharges. A complete new design of the sewer system would allow account of the diverse climate change threats. Without the SCCF intervention, only a wastewater network extension would likely take place which would still be vulnerable to climate change. The SCCF intervention will allow for the scaling up of the wastewater pipes to allow for greater climate extremes to be dealt with.

Sub-Activity 2.2.2: Rehabilitation of water supply infrastructure in Bishkek

121. This sub-activity will mainly focus on the renovation of the sewage network, wastewater collection and treatment (reducing vulnerability to floods). The investment will involve climate-proofing the renovation and be partially be covered by the SCCF. It is estimated that 50% of the city's sewage system will be covered due to SCCF's intervention. Otherwise, the baseline level would be ~20%.

122. Priority wastewater infrastructure projects include:

- Rehabilitation of wastewater collectors;
- Supply and laying of collectors in new collection areas;
- Various measures needed at the wastewater treatment plant;
- Rehabilitation of wastewater pumping stations.

Output	**Output Indicator**	**Baseline Value**	**Targets at the End of Project**
Output 2.1. Approaches to increase efficiency of water use and reduce climate vulnerability (water metering, wastewater recycling)	Type of adaptation technologies transferred to targeted groups.	**Type**	**Type**
		No water meters (consumption estimated by norms)	Bulk and End-user water meters
		No leak detection equipment or repairs	Leak detection control equipment and repairs
		Water and wastewater network not climate resilient	Water and wastewater network replacement and extension

Table 5. Component 2: SCCF/adaptation relevance and benefits

Activities	**Outputs**	**SCCF and Adaptation Relevance, and Associated Benefits**	**Positive Benefits**
Approaches to increase efficiency of water use to reduce climate vulnerability	New water meters, water saving technologies and meter-based billing installed in all participating cities	Will allow potential impacts of climate change to be incorporated into future resource planning	Reduced resource wastage and quantitative values of water use leading to increased public awareness of water use issues. Reduced operating costs for utilities. Increased transparency of billing system and associated increases in willingness to pay and predictability of revenue stream.
Rehabilitation of drinking water supply infrastructure	Water supply infrastructure rehabilitated	*{infrastructure rehabilitation is considered business-as-usual development and will be funded by the EBRD (loans and grants) and other donors}*	Increased efficiency and reliability of water supply reduces climate vulnerability. Increased efficiency and reduced reliance on electrical energy supply. Reduced operating costs for utilities and increased quality of service. Reduced potential for source contamination and potential for safe use of treated water.

2.4 Component 3: Increasing capacity for water governance

Outcome 3: Institutional capacity developed and governance of water companies and city authorities strengthened for integrating climate change impacts into water resources management

2.4.1 Baseline

123. Water companies and city authorities generally lack the capacity to integrate climate change impacts into water resources management. Water and wastewater services are separated from the central administration and remain under municipal control yet are operated inefficiently with poor service quality and limited coverage. Financial and operational performances are also generally poor, particularly in the smaller cities.

2.4.2 Adaptation alternative

124. Given the uncertainty and evolving nature of climate impacts, there is a need to promote adaptive management and planning approaches. This Component addresses the remaining institutional and investment challenges to facilitate the mainstreaming of climate change in water resources management.

125. The interventions will improve the capacity of water utilities and municipalities to adapt to climate change, while improving corporate planning and fulfilment of national and international environmental and social standards. It is anticipated that there will be improved monitoring of climatic changes and risk information to enhance timely decision-making about adaptive planning and associated investments. Further, the project will provide a valuable demonstration of systems and associated benefits that could be replicated in the region. As project stakeholders will be actively networking and have increased capacity, future climate change adaptation projects will also be better supported.

Outcome Indicator	**Baseline Value**		**Target at the End of Project**	
	Number	**Type**	**Number**	**Type**
Adaptation actions implemented in national/sub-regional development frameworks	0	None existing	2	- Incorporation of climate change into decision-making for infrastructure - Monitoring system in place for climate risks
Outcome Indicator	Score (1-3)** - Female	Score (1-3)** - Male	Score (1-3)** - Female	Score (1-3)** - Male
Strengthened capacity to transfer appropriate adaptation technologies	1	1	2	2
Outcome Indicator	Female	Male	Female	Male
Number of additional people provided with access to safe water supply and basic sanitation services given existing and projected climate change	491,000	491,000	583,000	583,000

*** Scoring: (1-3): 1. No capacity achieved (< 50% correct), 2. Moderate capacity achieved (50-75%), 3. High capacity achieved (>75% correct)*

Activity 3.1: Institutional strengthening of water utilities and municipalities regarding management responses to climate change impacts

126. This activity will be coordinated with other donors' activities in related sectors in Kyrgyzstan. The main actors to be consulted are:

- Swiss State Secretariat for Economic Affairs (SECO): Provide cofinancing for several of the EBRD's Water and Wastewater Projects in municipal areas
- Asian Development Bank (ADB): A large project dealing with rural water supply and sanitation that has been funded by ADB is currently in its last stages, and a project dealing with both rural and urban areas in the Issyk-Kul area is being implemented by the Kyrgyz Ministry of Finance. ADB has also funded infrastructure in the cities of Osh and Jalalabad via the State Department for Reconstruction and Development of Osh and Jalalabad Cities (SDRD).

- World Bank: A national programme for rural water supply and sanitation as well as projects for improving irrigation have been funded by the World Bank. In urban areas the World Bank is funding general infrastructure projects that include water supply in several cities and small towns.

Among these donors, the EBRD distinguishes itself by being the only one to lend directly to municipalities and municipally owned companies. This puts the EBRD in a unique position of being able to contribute to capacity development at the local level. In this Activity, the EBRD will build on the trust created by its successful municipal projects by promoting institutional strengthening of management responses to climate change impacts.

Sub-activity 3.1.1: Design and implementation of a training program on adaptation to climate change geared towards climate-resilient sector development strategies

127. A climate change education and training program focused on adaptation to climate change will be designed and implemented. This will include training to management staff, focused on professional water resources management;

128. The climate change education and training program will take the first step towards ensuring that climate change assessments will be incorporated in the design and operation of water infrastructure . First, by increasing awareness of employees of water utilities and municipalities of potential climate change impacts on exacerbating water resource challenges in the region, and second by including illustrations of best practices in institutions that allow full consideration of climate change risks by those institutions.

129. Initial trainings will be given in those cities in which water infrastructure rehabilitation projects include climate-resiliency features in Component 2 of this Project (Talas and Bishkek).

130. Trainings will be designed after a training needs assessment. The assessment will be through a survey of potential trainees, and is intended to ensure that training is complementary to the knowledge that the target group already has.

131. Trainings will include information on:

- General introduction to anthropogenic climate change;
- Observed and projected climate change impacts in Kyrgyzstan, specifically on water resources (if there are already results from the water resources study performed in Activity 1.2, then these will be presented);
- General introduction to the concepts of risk, vulnerability, adaptation and resilience;
- The principles of risk and vulnerability assessment (if the risk and vulnerability assessments conducted in Activity 1.1 have been completed, then these will be presented);
- Good water resources management, adaptive management and mainstreaming of climate change;
- Design and appraisal of climate resilient water infrastructure (refer to Activity 1.3);
- Climate monitoring (refer to Activity 3.2);
- Case studies of adaptation in water resources management.

132. All training materials such as presentations, descriptions of case studies etc. will be made publicly available, possibly via the website of the information network to be set up in Activity 3.3. The benefits of the course will be assessed through evaluation forms distributed at the end of the training and followed up 1-year later.

Sub-activity 3.1.2: Technical assistance to municipalities and water companies

133. In this activity city authorities and water companies' capacities to manage climate impacts on water resources on an ongoing basis will be strengthened, including technical assistance to improve transparency and governance;

134. Following up on the training program, technical assistance will be provided to staff in the process of implementing the necessary changes in their own institutions. It is expected that 40 women and 40 men will benefit from this training and technical assistance. This will be supported by the development of recommendations for institutional changes amongst water authorities and water users that will allow for continued consideration of climate change risks.

135. This will include one-on-one work with 2 municipalities will take place to ensure that aspects of climate resiliency are incorporated into their water sector development strategies (using inputs from Component 1).

Output	**Output Indicator**	**Baseline Value**		**Targets at the End of Project**	
Output 3.1. Institutional strengthening of water utility and municipalities to support adaptive planning	No. of individuals trained in adaptation-related technologies	Female	Male	Female	Male
		0	0	40	40
	Sectoral strategies that include specific budgets for adaptation actions	Type	Level	Type	Level
		Water resource development strategies not incorporating climate change	Municipal level for cities	Water resource development strategies incorporating climate change	Municipal level for 2 cities

Activity 3.2: Development of climate monitoring systems

136. Systems will be developed to strengthen monitoring of climatic changes, including dissemination of risk information and other important parameters.

137. One of the problems identified for the water sector in Kyrgyzstan is the dilapidated state of monitoring systems. All forms of monitoring decreased sharply after the collapse of the Soviet Union. This activity will be coordinated with stakeholders that are involved in ongoing efforts to restore monitoring systems in the country. The most urgent monitoring needs related to climate change will be discussed with these stakeholders and plans will be adapted in light of the result of this discussion. It is foreseen, however, that this activity will focus on groundwater resource monitoring systems.

138. The current status of monitoring of underground water resources is not sufficient to allow a sound analysis of the effects of climate change on this resource. Since Kyrgyz cities mostly draw their water from underground, groundwater monitoring systems are of particular relevance to the climate resilience of the urban water supply. As stated in Activity 1.2, improved groundwater monitoring systems are necessary to support the water resources studies that will be carried out in that Activity.

139. An assessment will be conducted of past and current groundwater monitoring in Kyrgyzstan. In this assessment the following information will be collected[21]:

- Kyrgyz legislation and institutional capacity for groundwater monitoring, and the division of responsibilities;
- Baseline data on the hydrogeological system;
- An overview of current monitoring collecting time-variant data on groundwater;
- Supporting information.

[21] Groundwater monitoring requirements as noted here follow: Sustainable Groundwater Management Concepts & Tools, Briefing note series, Note 9, "Groundwater Monitoring Requirements for managing aquifer response and quality threats, 2002-2006, GW-MATE Core Group, World Bank

140. Examples of the variables to be looked at are given in the following Table:

Table 6. Types of data required for groundwater management

Type of data	Baseline data (from archives)	Time-variant data (from field stations)
Groundwater occurrence and aquifer properties	• Water well records (hydrogeological logs, instantaneous groundwater levels and quality) • Well and aquifer pumping tests	• Groundwater level monitoring • Groundwater quality monitoring
Groundwater use	• Water well pump installations • Water-use inventories • Population registers and forecasts • Energy consumption for pumping	• Water well abstraction monitoring (direct or indirect) • Well groundwater level variations
Supporting information	• Climatic data • Land-use inventories • Geological maps/sections	• Riverflow gauging • Meteorological observations • Satellite land-use surveys

141. General specifications will then be drawn up for the system needed, consisting of the requirements for collection, analysis and storage of data on a regular basis as required for monitoring aimed at detecting changes in groundwater flow and trends in groundwater quality resulting from climate change. Since the successful operation of a monitoring network requires manpower and logistical resources, identification of those responsible for the monitoring and their involvement will begin at an early stage.

142. Locations will be selected at which a groundwater monitoring system will be set up, Locations will be chosen at which the groundwater flow system is understood and there is an identified need for monitoring due to their importance for public water supply, so that the systems to be set up will serve both to fulfil an immediate need and as demonstration and capacity building for national climate monitoring systems.

143. A final decision will only be made once all bodies taking part in the monitoring have expressed an interest in it and committed to keeping the system running after the end of this Project.

144. Once the locations have been chosen a detailed design of the monitoring system will be made, in consultation with the local users of the system. The monitoring network will be designed, consisting of a suite of observation wells coupled with a selection of abstraction wells. The number, location and specification of the observation wells needed will be determined. The system will be completed with a plan for the collection, analysis and storage of a range of data on a regular basis, with particular attention being paid to the creation of a sustainable system for storing the data for future use. This will consist of agreed data collection and storage protocols, a systematic database and arrangements for data sharing via the internet. Quality control and quality assurance procedures will be part of the design.

145. Implementation of the system will be by qualified consultants with proven experience in constructing observation wells. The equipment needed will be provided and a complete operational protocol and data handling system established. Training will be provided as needed in operation of the system and data interpretation.

Output	Output Indicator	Baseline Value		Targets at the End of the Project	
Output 3.2. Introduction of Information mechanisms, climate monitoring and early warning systems	Resilient infrastructure measures introduced to prevent economic losses	Type	Level	Type	Level
		Waste-water system vulnerable to climate change	Municipal level for a number of cities	Waste-water system improved to be resistent to climate change	Municipal level for a number of cities
	Type and No. of monitoring systems in place	Number	Type	Number	Type
		0	Groundwater monitoring systems	2	Groundwater monitoring systems

Activity 3.3: Development of an information network for participating cities

Sub-activity 3.3.1: Design and implementation of an information mechanism linking water authorities with climate specialists

146. In this Activity an information mechanism will be designed and implemented linking water authorities with climate specialists in order to utilize monitoring data. During use the system will be refined according to user needs.

Sub-activity 3.3.2: Launching an information network for cities

147. After assessing the information needs of water authorities, an information network will be designed and launched focused on the water sector of participating cities. Water authorities, local governments and other stakeholders will be trained on the network. Network usage will be monitored and refined as necessary.

148. A countrywide network is proposed consisting of the cities in which the EBRD currently has water/wastewater projects and the water companies of those cities. This network will share information on climate resilient urban water governance and on community involvement programmes for the urban water supply and wastewater sector. Joint activities will promote the sharing of experiences between cities and create a national knowledge base.

149. Since transport in Kyrgyzstan is severely constrained by the country's alpine topography, formation of a countrywide community will be encouraged by supplementing a few key joint events with communication by telephone and the creation of an online forum. In the design of the online forum care will be taken to take into account the limited bandwidth and the data limits on most Internet connections in the country.

Output	Output Indicator	Baseline Value		Targets at the End of Project	
Output 3.3. Information network for participating cities	No. of individuals trained in adaptation-related technologies	Female	Male	Female	Male
		0	0	60	60

Table 7. Component 3: SCCF/adaptation relevance and benefits

Activities	Outputs	SCCF and Adaptation Relevance, and Associated Benefits	Positive Benefits
Institutional strengthening of water utilities and municipalities regarding management responses to climate change impacts	Utilities and municipalities trained on adaptation, and strengthened with improved governance and management capacity	Improved capacity of water utilities and municipalities to adapt to climate change	Improved corporate planning and fulfilment of national and international standards in environmental and social standards
Climate monitoring systems	Risk information for municipalities	Improved monitoring of climatic changes and risk information to enhance timely decision-making about adaptive planning and associated investments. Improved capacity of water authorities to use monitoring data for adaptive planning and other decision-making.	Will provide a demonstration of systems and associated benefits that could be replicated in the region.
Information network for participating cities	Information network on the water sector established for participating cities	Project stakeholders in the SCCF project are actively networking and have sufficient capacity to support the project activities.	Future climate change adaptation projects will also be better supported.

2.5 Component 4: Increasing community involvement in water governance and raising knowledge and awareness of climate change implications among water users

Outcome 4: Increased community involvement in water governance and awareness of climate issues in water governance

2.5.1 Baseline

150. Currently there is low community involvement in water governance in the candidate cities. Water companies and city authorities lack mechanisms to directly access households to implement adaptation measures, and to gather information on what works and what are the problems. In addition, there is low awareness among the community of climate issues related to water, including implications on water usage at the household and community levels.

2.5.2 Adaptation alternative

151. This Component seeks to ensure that the community involvement is sufficient to support and sustain the project initiatives tentatively through two mechanisms: establishing water use committees in selected urban areas; and collecting and disseminating lessons learned from participating cities.

152. Overall, this Component of the SCCF project is anticipated to increase awareness of climate change and its implications on water usage at the household and community levels. Direct access to households will be established to help implement adaptation measures, and to gather information that will improve utilities' relationships with communities and help identify needs.

The population will be engaged in the decision-making process for the water utilities, allowing for better community ownership, communication, and management.

153. Additionally, lessons learned will be collected and distributed to various municipalities throughout the country. The active dissemination of results will help ensure the demonstration value of the SCCF funding, leading to better project design in future climate change adaptation projects. This may also lead to additional projects being implemented by municipalities both in Kyrgyzstan and in other countries.

Outcome indicator	**Baseline Value**		**Target by End of Project**	
% of population affirming ownership of adaptation processes*	Female	Male	Female	Male
	0%	0%	50%	50%

* Note that this will be the percentage of those living in neighborhoods with Water User Committees

Activity 4.1: Establishing Water User Committees in selected urban areas

154. Water User Committees (WUCs) will be set up at the neighbourhood level using the existing system of neighbourhood associations. The consultant engaged in public awareness activities will help existing associations to create and mobilise the WUCs. Meetings with the communities from each neighbourhood will follow an information campaign about the importance and planned roles of the WUCs. In particular, the project will strongly encourage the committees to ensure an equitable representation of all population groups (in particular women) on the WUCs. Furthermore, the Consultants from the project will assist the WUCs with training and provision of material. The various WUCs will meet monthly to share information and co-ordinate and consolidate their position on a citywide basis in a Forum of Water User Committees (FoWUC).

155. The main tasks of the WUCs will be to gather concerns and complaints (e.g. quality of service, affordability of tariffs) of private customers within each area and ensure that they are forwarded to the water company or to the city authorities and to represent customers in the consultation process carried out by the Company and the local authorities on issues related to water provision (e.g. programming of rehabilitation measures, introduction of water meters, tariff changes). Water Use committees will also assist the water companies with dissemination of information to the public (e.g. regarding construction works, installation and treatment of meters, water cuts and shortages).

Output	**Output Indicator(s)**	**Baseline Value**		**Target by End of Project**	
Output 4.1. Water User Committees established in selected urban areas	No. and type of community groups trained in climate change risk reduction	Number	Type	Number	Type
		0	No existing community groups	25	Water User Communities

Activity 4.2: Collection and dissemination of lessons learned from the project

156. Once the project is underway, the results and lessons learnt will be collected and documented for each participating city. Lessons learned will then be disseminated within Kyrgyzstan, particularly at the city level, but also to other EBRD countries and to other financial institutions. This will highlight the achievements of the projects and the co-benefits for utilities, consumers and communities. The intent is to ensure that lessons from projects in each city are identified and promoted thereby maximizing demonstration and replication effects.

157. Various channels of communication will be used for the dissemination. A report about project outcomes, lessons learnt and results achieved will be produced and written in Kyrgyz and

Russian, as well as English, and will be made available both within Kyrgyzstan as physical copies, and more widely available on the internet. The results of the project may also be presented in international forums, such as conferences and high-level meetings, particularly if all the indicators are met successfully.

158. A major channel for the dissemination of the lessons learned will be the national network for climate resilient urban water governance and community involvement that will be created in Component 3.3 of the project. Since different cities are at various stages of project development, collecting the lessons learned as project implementation progresses in those cities at more advanced stages will enable continuous learning and improvement for cities in which the projects start later. As results become available, they will be publicized at network meetings and published on the network website. Both the website and the documents available on it will be kept light to promote their accessibility to users with limited internet bandwidth.

Output	**Output Indicator(s)**	**Baseline Value**		**Target by End of Project**	
Output 4.2. Collection and dissemination of lessons learned to cities in Kyrgyzstan and other EBRD countries	**Output Indicator**	Female	Male	Female	Male
	No. of municipal water companies and government/municipal employees receiving information on lessons learned	0	0	100	100

Table 8. Component 4: SCCF/adaptation relevance and benefits

Activities	**Outputs**	**SCCF and Adaptation Relevance, and Associated Benefits**	**Positive Benefits**
Water User Committees	Water User Committees established in selected urban areas	Increased awareness of climate change and its implications on water usage at the household and community levels. Direct access of Committees to households to implement adaptation measures and to gather information on what works and what are the problems.	Population will be engaged in the decision-making process for the water utilities, allowing for better community ownership, communication, and management. Will improve utilities' relationships with communities and help identify needs.
Lessons learned from the project	Lessons learned from participating cities collected and disseminated	Active dissemination of results ensures the demonstration value of the SCCF funding, leading to better project design in future climate change adaptation projects.	May lead to additional projects being implemented by municipalities both in Kyrgyzstan and in other countries.

3 Rationale for the Bank's involvement

3.1 Fit with the EBRD

159. The proposed project's objectives are consistent with the EBRD's *Country Strategy for the Kyrgyz Republic* (BDS/KY/07-01), the EBRD's *Municipal and Environmental Infrastructure Operations Policy* (BDS/04-68) and the *Early Transition Countries Initiative*.

160. The EBRD's *Country Strategy for the Kyrgyz Republic* identifies the main priorities of fostering the private sector, strengthening the financial sector and supporting critical infrastructure projects. In developing private businesses, the EBRD targets direct financing to agribusiness, textile, property and tourism, consumer services, as well as natural resources. In the financial sector, activities focus on strengthening the Bank's partner financial institutions (in terms of capital, corporate governance and general competitiveness) and developing new products that reduce financial institutions' foreign exchange risks. Support for critical infrastructure includes financing for privatisations (telecoms) or concessions (power, roads, gas pipelines). Where possible, projects are regional in nature. This project addresses the strategic priority of critical infrastructure.

161. The EBRD focuses its activities on supporting micro, small and medium-sized enterprises and developing key infrastructure projects. To date, the EBRD has committed about EUR 250 million in various sectors of the Kyrgyz economy, mobilizing additional investments of about EUR 500 million in over 70 projects.[22] The EBRD Early Transition Countries Fund for Technical Cooperation funds projects in Armenia, Azerbaijan, Georgia, the Kyrgyz Republic, Moldova, Mongolia, Tajikistan and Uzbekistan and is the EBRD's main vehicle for channelling donor funding to these countries.

162. Following close consultation and collaboration with the Government of the Kyrgyz Republic and municipal officials, this project relates to the EBRD's framework operation for water and wastewater utilities in the Kyrgyz Republic (April 2011). This framework operation ("Framework") consists of sovereign debt facilities to be provided for water utilities in cities throughout the Kyrgyz Republic, co-financed with capital grants from donors. The first two sub-projects were for the Osh Water and Wastewater Rehabilitation and Jalalabad Water and Wastewater Rehabilitation, two sovereign loans of up to EUR 3 million each on-lent to the Companies to finance investments in water supply and wastewater management improvements. Additional municipal operations in the Kyrgyz Republic are the Bishkek Water Project (2009) (not yet under the Framework), Karabalta (2012) and under preparation Talas, Kant, and Bishkek Water II.

163. This Framework builds on the EBRD's track record in supporting water sector reforms across early transition countries and will be a vehicle to support critical investments in smaller towns, which would be difficult to financing on a stand-alone basis. Projects will improve the quality and reliability of water supply and wastewater management and the operational performance of the Companies involved.

164. The EBRD office is based in Bishkek with a professional staff of seven (senior bankers, associate bankers, analyst, programme monitor) and administrative staff of three.

[22] http://www.ebrd.com/pages/news/press/2011/110124c.shtml

3.2 Risks

Table 9. Risks

Risk	Level	Risk mitigation approach
Political	Med	Economic growth was adversely affected by the civil unrest in 2010 and the GDP declined by 1.5%. The economy is now stabilising and GDP growth of 5% is expected in 2011. The civil unrest had an adverse effect on the fiscal stance, and the government is now prioritising social and reconstruction needs, such as rehabilitation of water supply. The government remains fragile and political conditions have not been fully stabilised. Dealing with independent water suppliers will guard against this risk.
Environmental and Social	Low	Localized and/or temporary risks during construction phases are site-specific and will be addressed through the EBRD's established policies and procedures, in particular the Environmental and Social Action Plan that includes mitigation measures and corrective actions identified during project due diligence covering construction and operation stages.
Institutional	Low/Med	The credit risk posed by the creditworthiness of the participating Water Companies will be addressed in several ways. The loan/grant ratio will be assessed against creditworthiness and affordability constraints. Loan agreements will include targeted/required water payment collection rates.
Technology	Low	Technology employed will be standard (base water pumps, ground works and standard network rehabilitation).
Implementation	Med/ High	Where cities have no experience of implementing an IFI-financed project the implementation related risk could be high. The EBRD will assess each participating water company's implementation capacity either using the Bank's toolkit or as part of the due diligence to establish the risks involved, if any, and determine the scope and volume of post-signing TC support to assist in implementing the Project. The Feasibility Study will provide the basis for defining the procurement packages and assessing associated contractual risks.

3.3 Socioeconomic benefits and gender dimensions

165. The efficiency of water use is a local social issue and a regional political issue, both of which are becoming increasingly important over time and under climate change stressors. The socio-economic benefits delivered by the project include resource savings through reduced drinking water consumption, reduced leakage and water losses, enhanced water supply, and improved access to cleaner and more climate-resilient water sources.

166. The associated economic benefits of reduced resource use will make participating cities more competitive, and can thus support better the well-being of their populations. This is particularly important for women who are particularly vulnerable to economic and climate risks, and who are often directly impacted by the ease of access to household water for domestic purposes. Although the higher vulnerability of women is well known, a systematic review of the literature on adaptation action found that women are rarely referred to[23]. As an example of the measures taken in the project to further support equity and gender mainstreaming, the water usage committees formed under the project will ensure equitable representation of all population groups, in particular women.

[23] Berrang-Ford, L. et al. 2012 "Are we adapting to climate change", Global Environmental Change, Volume 21, Issue 1, February 2011, pg. 25-33

167. The EBRD is committed to ensuring that the interests of all citizens in the communities in which it is active, including women, men, people with disabilities and citizens with different social backgrounds and economic capacities, are represented in the municipal and environmental infrastructure projects that it support. However, experience – both from within Kyrgyzstan and internationally – has shown that equal access and opportunity cannot be achieved unless specific attention is paid to integrating diverse interests, needs, perceptions and priorities into all stages of the project planning cycle.

168. The EBRD has been developing a number of methodologies and guidance materials to address social and gender issues at all stages of the project life cycle. The EBRD includes in its projects advisory services to municipalities and service providers such as water companies to integrate social and gender considerations into the planning and management of communal services. These services will help to make municipal services provision more demand driven and will provide recommendations aimed at improving the Client's human resources policies and practices, both from an equal opportunities and a commercially focused perspective.

169. The gender advisory services include: (a) developing a process to include gender considerations in the design and delivery of demand driven municipal services; (b) promoting equal opportunities in human resources policies and practices and identifying specific actions as may be appropriate, along with identifying the business case for the recommendations; and (c) adopting an approach for gender responsive budgeting and capacity building so as to deliver demand driven and customer responsive services. The City of Bishkek has committed to promoting gender mainstreaming initiatives and to taking the recommendations into consideration.

170. In Kyrgyzstan, women were found to be more aware of quality and more affected by disruptions to services as they have requirements for water throughout the day. In addition, for those households not connected to the mains, it is mainly women who carry water back to the house. Women may be particularly concerned about pollution issues that have an impact upon food availability, health and child development. Women are the primary guardians of health and carers, and therefore are more likely to be aware of health, safety and security issues affecting the community. For instance, in the area of sanitation facilities, in urban and semi-urban areas not connected to central sewage systems, many buildings will have cesspits or septic tanks. Women are most likely to be responsible for sanitation tasks such as cleaning toilets and enforcing good family hygiene practices. The improvement of sanitary facilities is thus of particular importance for women.

171. The Environmental and Social Analysis and Action Plans that have been developed for Talas (and are pending for Bishkek), identify the direct and indirect positive impacts and benefits for the current and future society and population of the improved water supply and sanitation situation in cities in which water and wastewater projects are initiated.

Table 10. Benefits expected from the project by Component

Component	**Benefits**
Component 1: Integrating climate change assessments into the design and appraisal of water infrastructure	
Risk and vulnerability assessment	• Allows for reduced impacts on vulnerable populations through adoption of improved planning processes.
Water resource study	• Provides a foundation for informed decision-making.
Component 2: Building in additional climate-resiliency features in water infrastructure rehabilitation projects	
Design and Appraisal Methodologies	• Provides a foundation for future water infrastructure projects to be climate resilient.

Component	Benefits
Approaches to increase efficiency of water use to reduce climate vulnerability	• Reduces resource wastage and quantitative values of water use leading to increased public awareness of water use issues. • Reduces operating costs for utilities. • Increases transparency of billing system and associated increases in willingness to pay and predictability of revenue stream.
Rehabilitation of drinking water supply infrastructure	• Increases efficiency and reduced reliance on electrical energy supply. • Reduces operating costs for utilities and increases quality of service. • Reduces potential for source contamination and potential for safe use of treated water.
Component 3: Increasing capacity for water governance	
Institutional strengthening of water utilities and municipalities regarding management responses to climate change impacts	• Improves corporate planning and fulfilment of national and international standards in environmental and social standards
Climate monitoring systems	• Provides a demonstration of systems and associated benefits that could be replicated in the region.
Information network for participating cities	• Supports future climate change adaptation projects.
Component 4: Increasing community involvement in water governance and raising knowledge and awareness of climate change implications among water users	
Water User Committees	• Engages population in the decision-making process for the water utilities, allowing for better community ownership, communication, and management. • Improves utilities' relationships with communities and helps identify needs.
Lessons learned from the project	• May lead to additional projects being implemented by municipalities both in Kyrgyzstan and in other countries.

3.4 Stakeholders

172. Key project stakeholders include the Ministry of Finance, and water utilities and key local authorities, which have entered into a Project Support Agreement to support each separate sub-project. These are internal EBRD documents but available to the GEF Secretariat upon request. These local authorities have also confirmed their willingness to implement transition objectives associated with the project.

173. As the water projects are included in the Joint Economic Assessment conducted in 2010, there will also be coordination with other donors including the Asian Development Bank and World Bank as appropriate.

174. Stakeholder engagement and participation plans have been developed for Talas, Bishkek and Kant, as detailed in the section below. Table 11 summarizes key stakeholder groups, their roles and how they will be included in the project processes.

Table 11. Summary of key stakeholder groups

Key stakeholders	Role	Inclusion in process
Municipal water companies in participating cities	Supplier of water	Key component – project designed with full co-operation.
City authorities of each city	Local authority – involved in governing city and responsible to the public	Vital component, especially as renovation of water system will cause much disruption to transport systems within cities.
Population of cities	Water users – provide input through new Water User Committees	Involve water-users in decisions – the new Water User Committees should fulfil this role. Find out how they feel about changes to water supply, water use and water companies through baseline survey at project onset.
National Government – Ministry of Agriculture and Water Resources and other ministries	Make national decisions governing water quality and related issues	Provide information about progress of project and if there are any national legislative barriers.
Regional institutions (oblast or river basin level)	Make regional decisions governing water resources, environmental issues etc.	Provide information about progress of project and if there are any regional legislative barriers.
Businesses of cities	Water users	Collect information on how they use water and how they predict it will change in the future.
NGOs		Continue to consult NGOs to ensure that they are aware of, and informed about, the project. NGOs will be consulted regarding on-the-ground information about the water needs of local people.
Mass-media, internet	Disseminate information	Keep informed about project progress
Health and environmental monitoring authority	Monitoring water quality	Set up monitoring, recording and reporting procedures.
Health authority	Treating people with water-borne diseases and/or drought related diseases/malnutrition	Keep informed about possible issues and collect information from them about disease incidence.
EBRD	Funding agency	Project coordination
Contractors	Project execution	Inform other stakeholders on progress, react to stakeholder input where possible
Related projects and international organizations	Also active in the water sector in Kyrgyzstan	Coordination

3.4.1 Stakeholder Engagement in Bishkek[24]

175. Corporate Development and Stakeholder Participation Programme (CDP) support is being provided to Bishkek Water Company by an international consultant firm.

176. A stakeholder participation programme covering the entire city was presented during the workshop on Public and Customer Relations Programme in January 2012. The programme was discussed with all stakeholders including NGOs. This programme is now being finalised by the CDP consultant and Company based on the comments obtained from all interested parties.

177. Phase II of the Bishkek water and wastewater project will also include an updated Stakeholder Engagement Plan (SEP), prepared in compliance with EBRD policy and using guidance contained in the IFC handbook "Stakeholder Engagement" (2007). This will include, inter alia:

- Identification of all stakeholders and potentially affected groups;
- Action plan for consultation during preparation, construction and operations phases of the Project, including details on appropriate formats and any necessary differentiated approaches (for men and women, for example) for effective and culturally meaningful interaction with all relevant stakeholders;
- The development of a grievance mechanism;
- A disclosure plan with timetable of events and activities (what is to be disclosed, how, when and for how long), including identification of any locations where relevant Project documentation will be available locally and elsewhere.

178. Where appropriate the SEP should include consultation regarding the projected consequences of climate change.

3.4.2 Stakeholder Engagement in Talas[25]

179. A SEP was developed as part of the Talas Water and Wastewater Feasibility Study. The stakeholder plan outlines the requirements for public information and consultation, the way information will be provided, and how consultations will be facilitated during the project period and beyond. The Talas City Administration will be the authority overall responsible for coordinating and implementing the project activities, including implementation of the stakeholder engagement plan.

180. The Talas municipal water utility relates with its customers primarily through its Billing Department and its O&M Department. As part of the Feasibility Study, seven focus group discussions (FGDs) were conducted in June 2012. These included local leaders as well as current and potential future TTS customers. The FGDs clearly showed that both women and men were not satisfied with the very limited information that they received from TTS.

181. TTS's current and potential customers, including households, budget organizations and state and commercial enterprises are the main stakeholders. The City Council and its committees, departments within the Talas City Administration and municipal enterprises as well as TTS's staff also need to be kept informed. External stakeholders include also contractors, government institutions, companies, civil society organizations, and the mass media. An exhaustive list of stakeholders is included in the SEP.

182. Preferred channels of communication with current and potential future customers have been identified and will be used in future. Particular efforts will be made to ensure that the large groups of poor people in Talas City, including those not officially registered in the city, are reached with communication activities and that both women and men receive information and are consulted.

183. At the start of the design phase, the Talas City Administration will provide information to its citizens and other stakeholders. The outline contents of this information and the means of disclosing information are identified in the SEP.

[24] Source: reports of the Bishkek Municipal Advisory Services (Gender and Equal Opportunities)
[25] Source: Talas Water and Wastewater – Feasibility Study, Stakeholder Engagement Plan

184. It is anticipated that three public meetings will be held on the Project. A long-term stakeholder engagement and communication activities will also be designed by TTS. The first step will be to establish a Customer Relations Unit within TTS whose employees will receive training in customer relations and communication. Lastly, a specific public grievance mechanism will be set up for the purposes of this project for the duration of construction.

3.4.3 Stakeholder Engagement in Kant

185. Water supply in the City of Kant is unique in the sense that a private operator, OsOO MarketingService (the "Company"), has been in place since 1991. In April 2011 the lease contract was extended to 2026 based on a good track record in the delivery of reliable water services. The assets belong to the City and the Company pays an annual lease. While the Bank has many projects with water utilities in secondary cities across the ETC, this operation would be the first operation with a local private operator managing a water utility.

186. The Company officially services 14,000 people but in reality the population served is higher with many unregistered residents. With meters installed, clients will be charged in accordance with real consumption. The residents of one-family houses are connected to the drinking water supply system. Only a small number of houses are connected to the wastewater system, and most houses have septic tanks for wastewater management. The residents of multi-story buildings are connected to both the water and wastewater networks. In total, 33 percent of the population is connected to the wastewater system. All commercial enterprises are connected to the wastewater system and are metered.

187. A SEP was developed as part of the Kant Water Rehabilitation Project Feasibility Study. This SEP includes an identification of all stakeholders and potentially affected groups; summary of consultation activities undertaken prior and an action plan for further consultation during the preparation, construction and operations phases; a grievance mechanism; and a disclosure plan with timetable of events and activities including where relevant Project documentation will be available locally and elsewhere.

3.4.4 Stakeholders in transboundary issues

188. Under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, the UNECE set up the project Promoting Cooperation to Adapt to Climate Change in the Chu and Talas Transboundary Basin which ran for 3 years, from 2010 to 2012. The recommendations made by this project for future monitoring, modeling and water management are highly relevant to this project, and cooperation will be sought on these issues.

3.5 Cost-effectiveness

Cost Effectiveness of Approach

189. In the absence of the proposed EBRD-SCCF project, opportunities for infrastructure improvements directly geared towards climate change adaptation and resilience would be limited, both because of awareness and capacity barriers, but primarily because of a lack of financing for the sector. Investments made by municipalities would be small, piecemeal projects, and they would fail to capture efficiencies from coordination between urban systems and from considering demand-side investments for generating energy resources.

190. Investment from commercial sources or private parties would continue to be the exception rather than the rule, and many cities might be limited to funding emergency repairs rather than upgrades that could bring significant resource savings.

191. The proposed project approach is deemed to be the most cost-effective and most likely to lead to sustainable results, because the funds from the SCCF will leverage substantial investment from both the EBRD and the municipalities and utilities that will undertake improvements. Grants alone could never achieve the leverage that this combined approach will achieve. The project

aims to impact well over 1,000,000 people and directly improve the lives and access to safe, climate resilient water sources for ~90,000 people – of whom half are expected to be women.

Catalytic and Replication Effects

192. The proposed project will use approaches that have not been applied in Kyrgyzstan previously, and in this context the project will be highly innovative and with powerful demonstration impact. Component 4 will explicitly ensure that lessons are captured, evaluated and disseminated actively both within the country and region. The project will carry out investments in two cities – including the capital Bishkek and will also involve five additional cities – covering 3 different river basins. The impact from the project in terms of raising awareness amongst municipal water utilities is expected to have a catalytic effect for incorporating climate change into future planning.

3.6 Coordination with related initiatives

193. The EBRD is coordinating closely with other actors in the field of water infrastructure rehabilitation and capacity building for municipal utilities in the Kyrgyz Republic. A full list of related projects is included in Annex 2. Coordination between organizations in the water sector in the Kyrgyz Republic is conducted through the meetings and sessions of the Development Partners' Coordination Council's (DPCC) Water Supply and Sanitation Subgroup. The post-conflict JEA outlined cooperation with the World Bank, Asian Development Bank and the United Nations, and the proposed project will continue to ensure that needs are addressed while gaps and overlaps are avoided.

194. The proposed project will coordinate closely with other ongoing EBRD projects. In particular, this project will build upon lessons learned though the recently approved SCCF/EBRD project *Increasing Climate Resilience through Drinking Water Rehabilitation in North Tajikistan*. The project will also liaise with the EBRD water supply project in Bishkek begun in 2009 to modernize the water sector. Through that project, the EBRD and the Swiss Government provided EUR 11.8 million (non-reimbursable grant, sovereign loan and technical assistance funds) to improve the supply of water to some 1 million people living in Bishkek. The proposed project will also coordinate with the other sub-projects under the EBRD's *Kyrgyz Republic Water and Wastewater Framework*, in particular with planned interventions in Osh and Jalalabad.

195. This proposed project will also ensure coordination with other relevant initiatives in the country and region, including those detailed in Annex 2. Key ongoing initiatives include:

- ADB "*Issyk-Kul Sustainable Development Project*" (2009-2015) - The ADB project is of similar magnitude (investment costs of USD 37,5 million) with some elements in common with the proposed SCCF project, however, there is limited potential for duplication due to the projects' different geographical[26] and thematic focus, specific aims and project outcomes. In fact, several potential synergies exist between the projects that derive from their compatible visions concerning the importance of the Kyrgyz water sector as vital for the economic, ecological and human health. While the ADB project emphasises infrastructure (rehabilitation, upgrading and expansion) and commercial skills development, the proposed SCCF-EBRD project has a significant dissemination component (alongside infrastructure and capacity building) focusing on the replicability of specific urban interventions. As such, there is significant scope for cooperation between the significant dissemination activities of the proposed project (Component 4) and those of the ADB's Issyk-Kul project which are concerned mainly with dissemination among local and regional beneficiaries.
- World Bank's "*Second Rural Water Supply and Sanitation Project (RWSSP)*" (2009-2013) – This project focuses on improving access to potable water for the participating communities[27];

[26] The geographic coverage of the proposed SCCF project includes the cities of Talas and Bishkek; whereas the ADB project is focused on the cities of Balykchy, Cholpon–Ata, and Karakol.

[27] The geographic coverage of the World Bank project includes: Talas Oblasty, Naryn Oblasty, Issyk-Kul'skaya Oblast', Ak-Kochkor, Chuy Oblasty, Jele Tob.

and improving hygiene, sanitation and water-related practices at individual, family and institutional levels in the rural areas. This project provides financing for the following activities, among others: to rehabilitate or expand existing village water supply systems; to promote healthy hygiene and sanitation practices at the village-level; and to assist the Government to ensure sustainability of the rural water supply programs.

196. Given the innovative nature of this project, the demonstration impact will be significant. The project will actively disseminate its lessons to other water rehabilitation efforts in the country and region.

4 Project management

4.1 Project management structure

197. Project management supports measures to strengthen the key local stakeholders, covering supervision and financial management costs associated with the project. All of these project management activities will be funded by the EBRD.

198. This project will be directly executed by the EBRD. The project team consists of bankers and specialists from the specialist Municipal Environmental Infrastructure (MEI) team and the EBRD's Bishkek Office. Specialist input on procurement and implementation issues will also be available from the EBRD's staff team. All project activities funded by donors will be used either directly for investment, or to hire engineering and other specialist company consortia. These consultants, to be made up of competent local and international experts, will work closely with the project management and the General Directors of the Companies in the participating cities to deliver the project outcomes. The consultants will liaise with the Bank's Operation Leader, while providing all technical support, training and system development to the cities / companies necessary or advisable in order to achieve the objectives of their assignments. This structure is illustrated in Figure 2.

199. The EBRD is highly experienced in running similar technical assistant programmes using this management structure and is confident that it is a cost-effective approach to delivering the desired project outcomes.

200. In this particular project, project management costs for both the non-SCCF 'baseline' project and the SCCF-funded activities will be entirely covered by the EBRD and other co-financing sources.

201. Consultants will also assist the water companies to implement an Environmental and Social Action Plan (ESAP).

202. Within the project activities Water User Committees will be set up, which will enable urban water users to participate in the process of rehabilitation of their water supply and keep informed about work done on the project. Their opinions and feedback will be reported back to the water companies and to the Project Implementation Unit and Consultants working on the project.

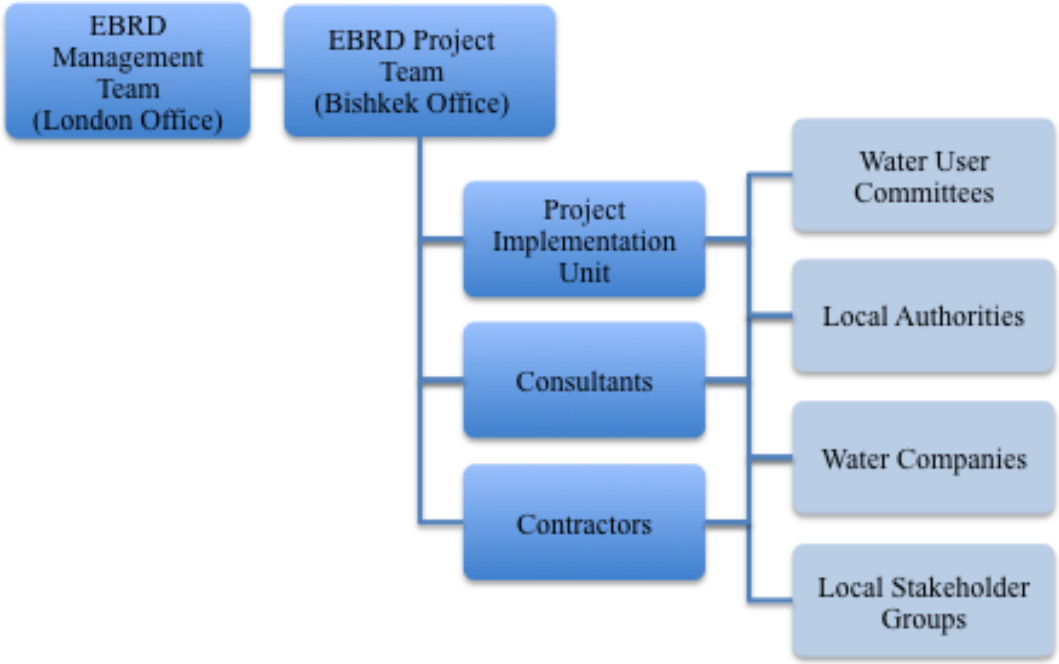

Figure 2. Implementation framework of the project

4.2 Consultancy

203. One consultancy is envisioned to carry out the technical cooperation activities of the project. This consultancy will be either a company or a consortium.

204. The primary element of the consultancy will assess water resources and support climate risks assessment, and will assist with one-on-one capacity building for the water utilities.

205. In addition, the consultancy will conduct public information dissemination activities and public outreach to various cities (including workshops), collect and disseminate lessons learned, run training activities, and assist in the formation of Water User Committees.

Annex 1. Project Results Framework

Component/ Outcome/Output	Related SCCF Outcome/Output (if applicable)	Objectively Verifiable Indicators	Baseline value	Targets	Sources of Verification	Risks and Assumptions
Component 1: Integrating climate change assessments into the design and appraisal of water infrastructure						
Outcome 1: Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas	Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas	**Outcome Indicator** Relevant risk information disseminated to stakeholders	No	Yes	Consultancy reports	**Risk -** Implementation risk that these studies will be possible given limited available information **Assumption -** Good cooperation with local authorities
Output 1.1. Risk and vulnerability assessments	Risk and vulnerability assessments conducted and updated	**Output Indicators** Risk and vulnerability assessment conducted	No	Yes	Assessment produced	
Output 1.2. Detailed water resources system studies	N/A - EBRD indicator	Number of detailed water resources system studies carried out for river basins	0	2	Studies produced	
Output 1.3. Design and appraisal methodology	N/A - EBRD indicator	Existence of a design and appraisal methodology for carrying out risk and vulnerability assessments	No	Yes	Design and appraisal methodology produced	

Component/ Outcome/Output	Related SCCF Outcome/Output (if applicable)	Objectively Verifiable Indicators	Baseline value		Targets		Sources of Verification	Risks and Assumptions
Component 2: Building in additional climate-resiliency features in water infrastructure rehabilitation projects								
Outcome 2: Decreased water demand and improved climate resilient supply of drinking water, reducing pressure on climate-vulnerable water resources	Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas	**Outcome Indicator**	Female	Male	Female	Male	Utility company reports	**Risks -** Environmental and Social related to community support for the implementation Institutional risk related to credit-worthiness and cooperation of utilities Technology risk that the technologies will function well in these communities **Assumptions -** the technologies will be taken up by the utilities and community members
		% of targeted groups adopting adaptation technologies by technology type						
		Bulk and End-user water meters	3%	3%	15%	15%		
		Leak detection control equipment and repairs	20%	20%	50%	50%		
		Water and wastewater network replacement and extension	20%	20%	50%	50%		
Output 2.1. Approaches to increase efficiency of water use and reduce climate vulnerability (water metering, wastewater recycling)	Relevant adaptation technology transferred to targeted groups	**Output Indicator**	Type		Type		Utility and consultant reports	
		Type of adaptation technologies transferred to targeted groups.	No water meters (consumption estimated by norms)		Bulk and End-user water meters			
			No leak detection equipment or repairs		Leak detection control equipment and repairs			
Output 2.2. Municipal water infrastructure rehabilitated			Water and wastewater network not climate resilient		Water and wastewater network replacement and extension			

Component/ Outcome/Output	Related SCCF Outcome/Output (if applicable)	Objectively Verifiable Indicators	Baseline value		Targets		Sources of Verification	Risks and Assumptions
Component 3: Increasing capacity for water governance								
Outcome 3: Institutional capacity developed and governance of water companies and city authorities strengthened for integrating climate change impacts into water resources management	Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas	**Outcome Indicator**	Number	Type	Number	Type	Consultancy reports	**Risks -** Institutional that the utilities and municipalities will be in favor of implementation and adopting climate resilient strategies/monitoring systems Technological - that the monitoring systems will work **Assumption -** The utilities will be able to implement the programme recommended and be interested in incorporating climate risks
		Adaptation actions implemented in national/sub-regional development frameworks	0	None existing	2	- Incorporation of climate change into decision-making for infrastructure - Monitoring system in place for climate risks		
	Enhanced enabling environment to support adaptation-related technology transfer	**Outcome Indicator**	Score (1-3)** - Female	Score (1-3)** - Male	Score (1-3)** - Female	Score (1-3)** - Male	Self-reporting Training Needs Assessment and follow-up	
		Strengthened capacity to transfer appropriate adaptation technologies	1	1	2	2		
	Reduced vulnerability in development sectors	**Outcome Indicator**	Female	Male	Female	Male	Utility company reports	
		Number of additional people provided with access to safe water supply and basic sanitation services given existing and projected climate change	491,000	491,000	583,000	583,000		

Component/ Outcome/Output	Related SCCF Outcome/Output (if applicable)	Objectively Verifiable Indicators	Baseline value		Targets		Sources of Verification	Risks and Assumptions
Output 3.1. Institutional strengthening of water utility and municipalities to support adaptive planning	Skills increased for relevant individuals in transfer of adaptation technology	**Output Indicator**	Female	Male	Female	Male	Self-reporting Training Needs Assessment and follow-up	
		No. of individuals trained in adaptation-related technologies	0	0	40	40		
	Adaptation measures and necessary budget allocations included in relevant frameworks	**Output Indicator**	Type	Level*	Type	Level*	Consultancy reports and the existence of strategies	
		Sectoral strategies that include specific budgets for adaptation actions	Water resource development strategies not incorporating climate change	Municipal level for cities	Water resource development strategies incorporating climate change	Municipal level for 2 cities		
Output 3.2. Introduction of Information mechanisms, climate monitoring and early warning systems	Vulnerable physical, natural and social assets strengthened in response to climate change impacts, including variability	**Output Indicator**	Type	Level	Type	Level	Utility and consultant reports	
		Resilient infrastructure measures introduced to prevent economic losses	Waste-water system vulnerable to climate change	Municipal level for a number of cities	Waste-water system improved to be resistent to climate change	Municipal level for a number of cities		
	Systems in place to disseminate timely risk information	**Output Indicator**	Number	Type	Number	Type	Consultant reports	
		Type and No. of monitoring systems in place	0	Groundwater monitoring systems	2	Groundwater monitoring systems		

Component/ Outcome/Output	Related SCCF Outcome/Output (if applicable)	Objectively Verifiable Indicators	Baseline value		Targets		Sources of Verification	Risks and Assumptions
Output 3.3. Information network for participating cities	Skills increased for relevant individuals in transfer of adaptation technology	**Output Indicator**	Female	Male	Female	Male	Training reports from consultants	
		No. of individuals trained in adaptation-related technologies	0	0	60	60		
Component 4: Increasing community involvement in water governance and raising knowledge and awareness of climate change implications among water users								
Outcome 4: Increased community involvement in water governance and awareness of climate issues in water governance.	Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	**Outcome Indicator**	Female	Male	Female	Male	Survey of members of the Water User Communities	**Risks -** Social related to the ability to create sustainable Water User Committees with public buy-in **Assumptions -** Assumes public interest will be present in the communities
		% of population affirming ownership of adaptation processes	0%	0%	50.0%	50%		
Output 4.1. Water User Committees established in selected urban areas	Targeted population groups participating in adaptation and risk reduction awareness activities	**Output Indicator**	Number	Type	Number	Type	Consultancy reports	
		No. and type of community groups trained in climate change risk reduction	0	No existing community groups	25	Water User Communities		
Output 4.2. Collection and dissemination of lessons learned to cities in Kyrgyzstan and other EBRD countries	N/A - EBRD indicator	**Output Indicator**	Female	Male	Female	Male	Consultancy reports based on tracking recipients	
		No. of municipal water companies and government/municipal employees receiving information on lessons learned	0	0	100	100		

Annex 2. Key ongoing projects relevant to the Kyrgyzstan water sector

Project Name	Budget and Executive Agency	Duration	Priority Sector	Objectives	Geographical Focus
The EBRD and the Swiss State Secretariat for Economic Affairs (SECO)					
Improvement of Water Supply in Bishkek city:	EBRD Loan – 5,500,000 EUR SECO Grant – 5,000,000 EUR *Bishkek Vodokanal*	2011 - 2014	Water and wastewater	Improve water and wastewater services in Bishkek: (1) Replacement of water pipes, (2) Replacement of submerged pumps, (3) Re-drilling and installation of new boreholes, (4) Supply and installation of water meters, (5) Replacement of machinery, (6) Replacement of chlorination units	City of Bishkek
Water and Waste Water Rehabilitation in the City of Osh	EBRD Loan – 3,000,000 EUR SECO Grant – 4,300,000 EUR *Osh Vodakanal*	2011 - 2014	Water and wastewater	Improve water and wastewater services in Osh: (1) supply and installation of water meters (bulk flow/consumer), (2) replacement of water pipes, (3) rehabilitation of pumping stations, (4) extension of sewerage system, (5) WWTP rehabilitation	City of Osh
Water and Waste Water Rehabilitation in the City of Jalalabad	EBRD Loan – 3,000,000 EUR SECO Grant – 4,100,000 EUR *Jalalabad Vodakanal*	2011 - 2014	Water and wastewater	Improve water and wastewater services in Jalalabad: (1) supply and installation of water meters (bulk flow/consumer), (2) modernization of water supply and distribution system, (3) sewerage maintenance vehicles, (4) extension of sewerage system including waste water pumping station and force main, (5) WWTP rehabilitation	City of Jalalabad
Asian Development Bank					
Community-Based Infrastructure Services Sector Project -	30,000,000 USD *ARIS*	2008-2013	Rural water supply and sanitation	Improvement of rural water supply and sanitation: 1) rehabilitation of water supply and sanitation systems, (2) capacity	Chui, Osh, Jalalabad and Batken oblasts

Project Name	Budget and Executive Agency	Duration	Priority Sector	Objectives	Geographical Focus
Supplementary				development of communities and local administrations, (3) sanitation and hygiene community awareness and education program, and (4) provision of O&M equipment to the communities.	
Issyk-Kul Sustainable Development Project	20,000,000 USD *Ministry of Finance*	2009-2015	Economic growth; tourism; rural livelihoods; social development; private sector development	Environmental preservation of Issyk-Kul region; improvements in the water supply, sanitation and solid waste management systems; new sewage treatment plants; rehabilitation and extensions of the water distribution network; sanitary landfills and medical waste incinerators for three urban centres. Other proposed works include community services for improving water supply and sanitation in schools.	Sub-national (Issyk-Kul region)
Emergency Assistance for Recovery and Reconstruction	28,000,000 USD *SDRD (State Department for Reconstruction and Development of Osh and Jalal-abad Cities)*	2010-2013	Public infrastructure	Improvement of essential public infrastructure: (1) rehabilitation of water supply and sewerage systems, (2) rehabilitation of public sanitation facilities, (3) provision of O&M equipment and vehicles.	Osh and Jalalabad
Swiss State Secretariat for Economic Affairs (SECO)					
Karakol Water Supply Rehabilitation	9,500,000 CHF *Karakol Vodokanal*	2005-2012	Drinking water supply	The main goal of the Project is to provide cost effective investments and tariff reform in drinking water supply of Karakol: (1) Construction of one new surface water treatment plant; Rehabilitation of existing and construction of new	Karakol

Project Name	Budget and Executive Agency	Duration	Priority Sector	Objectives	Geographical Focus
				production wells; construction of new distribution mains and rehabilitation of the distribution network; Rehabilitation and new construction of service connections; Installation of connection meters; Gradual installation of connection meters according to choice of population; (2) Institutional and Capacity Building Component	
World Bank					
Second Rural Water Supply and Sanitation Project (RWSS 2)	10,000,000 USD *ARIS*	2009-2013	Water management; health;	To improve access to potable water for the participating communities; and improve hygiene, sanitation and water-related practices at individual, family, and institutional levels in the rural areas	National
Bishkek and Osh Urban Infrastructure Project (BOUIP)	12,000,000 USD *ARIS*	April 2008-June 2015	Urban services	To increase the availability of basic urban services in semi-formal new housing developments (known as novostroiki) in Bishkek and Osh, as well as in selected small towns of the Kyrgyz Republic, and to increase the availability of social infrastructure: (1) Road and water supply infrastructure works (2) Small community investments (3) Institutional development activities (4) Project management.	Bishkek and Osh, and other selected small towns of the Kyrgyz Republic

Project Name	Budget and Executive Agency	Duration	Priority Sector	Objectives	Geographical Focus
Bishkek and Osh Urban Infrastructure *Additional Financing Project* (BOUIP AF)	15,800,000 USD *ARIS*	2012-June 2015	Urban services	(1) Bishkek, Osh and Selected Small Towns Infrastructure Development, (2) Community Investment Program, (3) Institutional Development, (4) Project Management, Coordination, Monitoring and Evaluation	Bishkek and Osh, and other selected small towns of the Kyrgyz Republic
Water Management Improvement Project (WMIP)	28,100,000 USD *Kyrgyz Min of Agriculture, Water Resources and Processing Industry*	2006-2012	Agriculture; water resource; rural development	To improve irrigation service delivery and water management for the benefit of a sustainable increase in irrigated agricultural productivity; and improving national water resource governance for the benefit of water users and the nation as a whole.	National
Second On-farm Irrigation Project	20,550,000 USD *Kyrgyz Ministry of Agriculture, Water Resources & Processing Industry*	2007-2015	Agriculture	Improve irrigation service delivery on a sustainable basis that will contribute to increased agricultural productivity among irrigation farmers; temporarily cover incremental operating costs of Water Users Association Support Units (WUA-SUs) for vehicle operation, trainings, workshops, office operating costs and simple equipments	National
Second On-farm Irrigation Project: *Additional Financing*	15,050,000 USD *Kyrgyz State Committee For Water Resources And Land Improvement*	2011 (approved)	Water management; rural development	Additional Financing to help finance the costs associated with scaling up of project activities	National