

Funded by:



European Union



german  
cooperation

DEUTSCHE ZUSAMMENARBEIT

Published by:

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

In cooperation with:



The Regional Environmental  
Centre for Central Asia



# ISFARA RIVER BASIN PLAN

## Batken District

## Kyrgyz Republic

*This publication has been produced with the assistance of the European Union in the framework of Water Management and Basin Organisations in Central Asia project. Its content is the sole responsibility of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Transboundary Water Management in Central Asia Programme and should in no way be taken to reflect the views of the European Union.*

**Published by**

Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices Bonn and Eschborn, Germany

Transboundary Water Management in Central Asia Programme

Toktogul st., 96-6

720040 Bishkek

Kyrgyz Republic

T +996 312 906 – 526

F +996 312 906 – 526

E [waterca@giz.de](mailto:waterca@giz.de)

I [www.giz.de](http://www.giz.de); [www.waterca.org](http://www.waterca.org)

**In cooperation with**

Regional Environmental Centre for Central Asia (CAREC)

Orbita-1, 40

050043 Almaty

Kazakhstan

T + 7 727 278 51 10

F +7 727 270 53 37

E [info@carec.kz](mailto:info@carec.kz)

I [www.carecnet.org](http://www.carecnet.org)

As at	May, 2014
Published	TRIADA Print
Layout	TRIADA Print
Picture credits	© GIZ – archive



## Abbreviations and acronyms

WUA	Water Users Association
ARIS	Community Development and Investment Agency
A/O	Aiyl Okmot
BP	Basin Plan
BWMD	Basin Water Management Department
WB	World Bank
SS	Sewage system
WSS	Water supply systems
DIS	Farm Irrigation System
SWRA	State Water (Resources) Administration
SWRI	State Water (Resources) Inspection
MWIF	Main water intake facility
RWSD	Rural Water Supply Department
SMC	State Meliorative Cadastre
DWE&M	Department of Water Economy and Melioration
CDN	Collector-drainage network
KR	Kyrgyz Republic
MS	Meteorological Station
IFN	Inter-farm network
IWRM	Integrated Water Resources Management
HGMT	Hydrogeological Meliorative Team
HGME	Hydrogeological Meliorative Expedition
MoAM	Ministry of Agriculture and Melioration
ICCWC	Interstate Commission for Water Coordination in Central Asia
MES	Ministry of Emergency Situations
CDWUU	Community Development Water Users Union
RAEOS	Regional Administration for Environmental and Occupational Safety
DWA	District Water Administration
TDEPFM	Territorial Department for Environmental Protection and Forest Management
MO&M	Management, Operation and Maintenance
IHMS	Integrated Hydrometeorological Station
FS	Feasibility Study
DED	Design Estimate Documentation
OIP	On-farm Irrigation Project
MAC	Maximum Allowable Concentration
ISF	Irrigation Services Fee
SanPiN	Sanitary Regulations and Standards
SNiP	Construction Norms and Regulations
2TP-vodhoz	State Water Use Statistics Reporting

## Contents

Introduction	5
1. Basin characteristics.....	5
2. Water resources management and water use .....	8
3. Urgent issues and problems .....	9
4. Vision of the Isfara River Basin in long-term perspective .....	10
5. Goals and objectives of the Basin Plan.....	10
6. Measures implementation mechanism and sources of financing .....	10
7. Action Plan for short-term prospects (2015-2020).....	12

## Introduction

The Basin Plan for the Isfara River (short version) was developed in the framework of ‘Water Management and Basin Organisations in Central Asia (WMBOCA)’ project funded by the European Union and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Transboundary Water Management in Central Asia Programme.

## 1. Basin Characteristics

### Climate

Moderate continental climate. Average monthly temperature is +12<sup>o</sup>, minimum -2<sup>o</sup> in January and maximum +26<sup>o</sup> in July. However, over the last years maximum temperature reached about +40<sup>o</sup> in summer and -26<sup>o</sup> in winter, which confirms the trends in climate change.

The annual range of relative air humidity at the Batken station is 44% (maximum 86%, minimum 42%).

The long-time average annual precipitation is 212 mm, and the maximum precipitation falls in the period from March to May.

### Hydrology

The Isfara river basin is situated on the northern slopes of the Turkestan Range, and is a part of the Syr Darya river basin (Aral Sea basin), total area of the basin is 3,240 km<sup>2</sup>, length – 102 km. The Isfara River springs from confluence of the rivers Kshemysh and Karavshin, which originate from the Aksu glacier at a height of more than 5,000 m in Batken region of Kyrgyzstan. There are 18 streams of first and second orders and the total length of all the streams of the Isfara River is about 499 km. The mouth section of the Isfara River traces back only to the Big Ferghana Canal on the territory of the Republic of Uzbekistan, and the River does not reach the Syr Darya River due to its total distribution for irrigation.

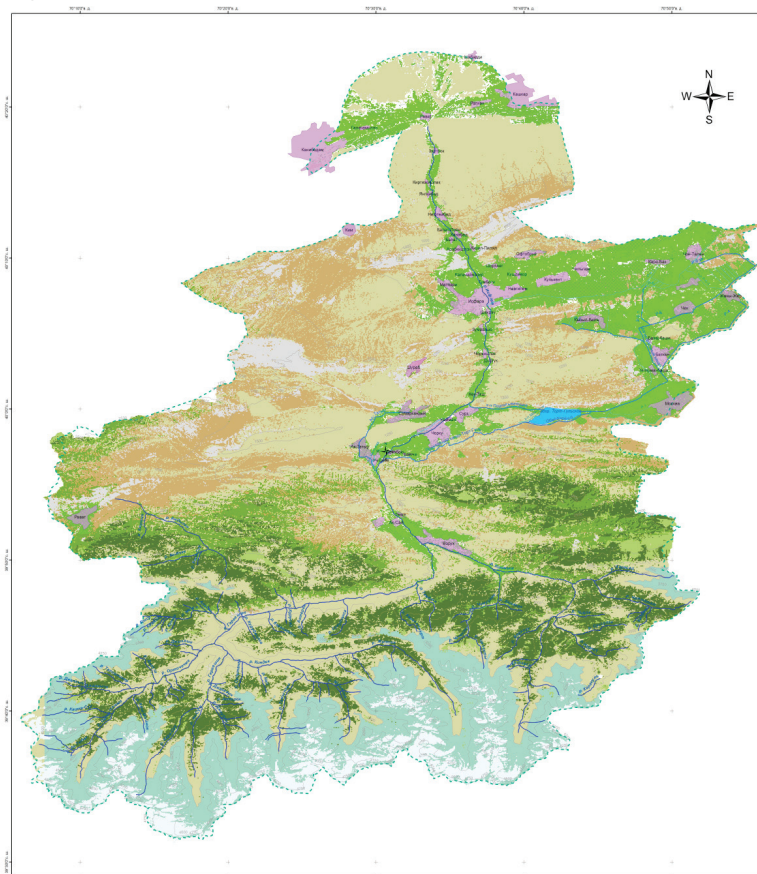


Figure 1. Land use map of the Isfara river basin

According to the classification by V. Schultz (renown Central Asian hydrologist), the Isfara River is a glacier-snow-fed river, characterised by the relatively heavy weight of glacier-melt water and drains the highest areas of the northern slope of the Turkestan Range. In flood seasons, the peak discharges loaded with solid material up to 50-60 kg per 1 m<sup>3</sup> of water are frequently reported. Mudflows are mainly caused by rain storms, rains combined with melting of seasonal and high-mountain snow. Mudflow recurrence in the Isfara river area is 0.7 for the 61 years of observations. In terms of water balance, the Isfara river basin can be divided into two zones – flow formation and distribution. The formation zone includes the upper mountain part (upstream of the Vorukh enclave), water balance of which is marked by preponderance of water supply to atmosphere over water discharge. The flow distribution area is located downstream from the catchment area (downstream from the Vorukh enclave). Due to large-scale evaporation, the river flow is formed by water supply from the catchment area, originated by melting of glaciers and snow in early spring and winter.

### Ecosystems and biological diversity

Belts of deserts and semi-deserts on typical sierozems and dark sierozems (up to 1,000-1,500 m) are developed on piedmont plains. A bit higher, the steppes on light-brown and brown soils reminding subtropical types of landscapes are widespread at heights of 1,300-2,000 m.

The Red Book contains the animal species such as snow leopard, Persian gazelles, varan. The endemic plant grows in the Isfara river basin. It is popularly called *Aigul*, its scientific name is *Fritillaria eduardii*, listed in some regional Red Books.

The percentage of forest areas of the Batken district is 7.4 % of the total area. Forests (45,148 ha) are in the state ownership and in spite of insufficient area play important role in development of economy and improvement of environmental conditions.

### Land resources

The total area of agricultural lands of the Batken district (the Isfara river basin) is 39,986 ha. Among them farm fields are 12,443 ha, including irrigated land of 7,364 ha. The total area of forest fund is 162,406 ha; lands of the Farmland State Fund are 4,927 ha.

### Agriculture

Agriculture is the leading branch of economy. Its share in GDP of the region is 70%. At that the share of crop farming in gross output is 61%, cattle breeding – 39%. In 2013, the volume of gross output in agriculture made up 2,817.7 million soms.

### Crop farming

In the structure of cultivated land, the following crops occupy a prominent position: wheat – 55%, corn – 25%, barley – 19%, tobacco and oil crops by 5%, the remaining are rice, vegetables, vineyards. They are situated on irrigated and boharic lands. More than 70% of arable farmlands are suitable for artificial irrigation. The boharic farming is only in hill country, more moistened part of the region. The annual average wheat harvest on irrigated lands of farm units is about 20-25 c/ha. The increase in productivity and cultivated land extension serve as factors of increase in harvest of cereal crops especially wheat as a main product of local population.

The Isfara river basin is a historically formed gardening zone, mainly represented by apricot, wild apricot (uryuk), apples, pears etc. The irrigated land under gardens occupies more than 4,000 ha. Here over many centuries, a large quantity of appreciable sorts has been selected and high quality of these fruits is known far beyond the Kyrgyz Republic. The harvest is 56-70.0 c/ha; the gross yield of fruits is about 40,000 tonnes. The most favorable conditions for cultivation of appreciable sorts of pome and drupaceous fruits are in submontane zone. However, due to the water resources deficit the commercial horticulture can be developed due to reclamation of stony areas, highest areas of foothills, places with broken ground with the use of water-efficient processes, for example drip irrigation.

### Cattle breeding

In villages of the Isfara river basin the livestock population is 121,753 units, of which cattle stock is 15,444 (13%),

including 8,974 (8%) cows, sheep and goats – 69,646 (58%), horses - 257 (1%) and poultry - 20%. The total quantity of households is 14,491, and an average quantity of livestock is 6.4 per one family. Despite the increasing quantity of livestock the pedigree cattle is reduced – average milk-yield is 4 l per day, also sheep prematureness is low, goats are meat-type. The food reserve is not sufficient, therefore the livestock yield is low and correspondingly, the revenue position of the population is low. In general, the rate of stocking is 1 cattle and 5 heads of small cattle per 1 conditional ha of pastures.

### Pastures

Each rural district of the Isfara river basin has own mountain grazings, pastures of the total area of 29,896 ha. At present, the load on pastures is increased especially in village areas. Due to the use of pastures their degradation occurs practically the year around with signs of the tramped pasture, soil consolidation, intensive crowding with rough and not grazed plants, depletion of valuable feeding sorts from plant stand, decrease on harvest of green and dry mass and gross stock.

### Potable water

The share of the Batken region population with access to safe potable water is one of the lowest in the Kyrgyz Republic, besides it decreased from 80% (2007) to 72% in 2010. In addition, supply of population with tape water is low - 64%. Nowadays many villages of the Isfara river basin (22 villages from 46 villages) do not have water supply systems and water is supplied from irrigation systems, springs and underground water. The quality of potable water in 10 cases from 100 does not comply with sanitary norms in terms of microbial and sanitary-chemical indices. The level of incidence of the following diseases is high: helminthism, acute intestinal infection and hepatitis C.

### Water quality

There is no industrial water pollution due to the absence of industrial enterprises. The irrigation water is sufficiently clean for irrigation.

There is a public sewage water treatment system in Batken city; however, its operation is not sustainable due to persistent shortage of funds and power cuts. The Drinking Water Supply System Rehabilitation Project was started in Batken city for the funds in the amount of 4 million Euro to be provided by the European Union.

### Industry

The industry of the district is represented by lignite mining, construction materials production and agricultural products processing, garment manufacture. There are some workshops such as machining shop, metal working shop, and fuel filling stations. 25 mills, 13 dairies, 7 metal working shops and 14 seed cleaning shops operate there. In the region, there are 18 machine workshops, 14 brick, concrete block, gang saw production shops and 15 operating fuel filling stations.

In general, not any large industrial enterprises are available in the Batken district and it is not planned to commission them in the short-term perspective, correspondingly the increase of industrial water intake is not expected. Moreover, there is no any remarkable influence of industry and production on water resources and ecology.

### Population

In 2013, the total population in the Isfara River Basin reached 79,236 people. Currently the population number in the Batken district, including Batken city is 101,985 people. The population density of the Batken district is lower than the whole Batken region and is 16.6 and 26 per m<sup>2</sup> correspondingly. There are no settlements in upper, mountainous river flow formation zone and therefore, the population density is not high, it is much higher at the downstream, in valleys and near the border with Tajikistan.

## 2. Water Resources Management and Water Use

### Legal and institutional fundamentals

The Water Law was adopted in 1994, and the Water Code – in January 2005. The Water Code introduces the concepts such as “water resources management principles” and “basin approach,” it is foreseen to execute basin plans for development, use and protection of water resources for each main river basin. The State Water (Resources) Administration shall arrange development of the programmes and schedules required for execution of basin plans and shall ensure control of their implementation. The draft basin plans shall be developed by the basin boards and be approved by the National Water (Resources) Board.

In accordance with the existing legislation and formed management structure, the authority responsible for water resources management in the concerned basin is the Batken District Water Management Department that is a structure of the Batken Basin Water Management Authority of the Department of Water Economy and Melioration of the Ministry of Agriculture and Melioration of the Kyrgyz Republic.

### Water economy infrastructure

Batken district State Irrigation Fund supplies water for 14,691 ha of irrigated land. The length of irrigation network is 664.6 km, including inter-farm network – 98.05 km. The network of 173.6 km is concrete-lined; 7.01 km are paved with flagstones and 231.9 km – flumed. Irrigation systems include 2,123 hydraulic engineering structures, of which 126 pieces are within inter-farm network. Irrigation network is equipped with 76 stream-gauging stations. 56 stations are within inter-farm systems, including 2 units in cable dielectric systems, 7 stations – with economy systems, 11 stations in cable dielectric systems.

The length of collector-drainage network is 254.9 km, including closed network – 80.9 km. There are 9 pumping stations in the region, among them 5 stations supply water from the Isfara river basin with allotted area of 735 ha.

### Water consumption in the Isfara river basin

Main water users of the Isfara river basin are the 7 WUA and 38 farm households. According to the data by State Statistical Reporting of *2TP-Vodhoz*, over the last five years the total volume of water intake for irrigation has been changing in the range of 213-230 mln.m<sup>3</sup>, the volume of use - 180-188 mln. m<sup>3</sup>, or the average irrigation standard is 2,000-2,500 cubic m/ha. The specific discharge rate of water irrigation standard per hectare should be reconsidered on a case-by-case basis for specific crops and soils.

The inter-farm and on-farm irrigation networks are in unsatisfactory condition (half-ruined), whereby the losses for transportation reach 12-18% of the water intake volume. In order to reduce leakage it is necessary to execute works on irrigation network rehabilitation, introduction of water-efficient processes of irrigations, including drip irrigation, especially for irrigation of gardens and vineyards. In recent years, the volume of water intake has been changing in the range of 130 – 156 mln.m<sup>3</sup>. The volume of use of collector and drainage waters has been changing in the range of 37-40 mln.m<sup>3</sup>.

### Interstate water allocation

The Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan have historically used the water resources of the Isfara River. Therefore, the inter-state water relations have been developing in the course of decades. In accordance with the Protocol on the inter-state allocation of flows of minor rivers of the Ferghana Valley, dated 11.04.1980, approved in the times of the USSR, the water apportioning of the Isfara River flow was adopted in the following proportions: Kyrgyzstan- 37%, Tajikistan – 55%, Uzbekistan – 8%.

### Water economy balance

The water balance of the Isfara River was prepared in the framework of the preparation of the Basin Plan text. The table below lists volumes of water resources of the Isfara River, water intake and limits of the Kyrgyz Republic. As it is evident, for the taken years, the average limit volume is 209 mln. m<sup>3</sup>, and the KR water intake volume is 118 mln. m<sup>3</sup>. Therefore, actual intake volume is 67 %, which is 33% less than the established limit.



Table 1. Volumes of water taken from the Isfara River against limit

Years	Annual average discharge of the Isfara River, m <sup>3</sup> /s	Volume, mln.m <sup>3</sup>		Actual volume of water intake of the KR, mln.m <sup>3</sup>	%
		total	KR limit		
2007	19.7	623	230	142	62
2008	20.8	654	242	156	64
2009	16.7	526	195	129	66
2010	16.4	519	192	134	70
2011	16.9	533	197	-	-
2012	17.1	539	199	145	73
2013	21.6	681	252	152	60
Average		566	209	118	67

The deposit of natural and usable underground water is not large. The amount of precipitation is not sufficient for groundwater replenishment; it mainly feeds the river flow. The model of regional underground flow in the upper mountain part of the basin is 1-3, and in the lowland part – 0.5-1.0 l/s with km<sup>2</sup>. Thus, the value of underground flow of the Isfara river basin is about 4.35 m<sup>3</sup>/s. (2l/s\*1560km<sup>2</sup>+1l/s\*1250 km<sup>2</sup>).

The Isfara River fills the Tortgul Reservoir with total storage capacity of 90 mln.m<sup>3</sup>, which was built in 1970 and serves for irrigation of fields in Kyrgyzstan and Tajikistan. The main water intake facility of the reservoir is intended for water intake to the intake channel, which is 19.7 km long and with capacity of 28 m<sup>3</sup>/sec.

### 3. Urgent Issues and Problems

During the meeting of the Working Group (WG) on Basin Planning in July 2013, dedicated to identifying the problems in the Isfara river basin, members of the WG concluded that solution of the following problems is the priority:

1. Potable water access – 12.4 scores.
2. Water management infrastructure at the basin level -12.2 scores.

In addition, members of the Basin Council and the WG mentioned importance of problems solving in the area of:

3. Ecological aspects of water resources management – 12.0 scores.

The highest-rated is the solution of the following water supply problems such as providing the population with access to safe potable water, enhancement of efficiency of the existing water supply systems, construction of drainage systems.

The problems of water management are considered as the second priority and it is necessary to implement the following measures to improve them:

- Secured and full supply of water for the users, farm and domestic households, water loss reduction.
- Decrease of ground water level, improvement of ameliorative conditions of irrigated land to enable reduction and prevention of land degradation, as well as to increase harvest of agricultural crops, which is very important to reduce poverty level of the local population.

Environmental issues of water management were at the third place.

As the Isfara River is of transboundary nature, the problems of water management at the upper part of the basin have also negative impact on downstream areas, leading to weak trust between neighboring countries on the issues of water allocation, disputes on some water management facilities of interstate use such as Aktatyr, Aksai canals, Tortgul Reservoir, the Isfara River.

Moreover, the problems with pastures degradation due to excessive cattle grazing, felling of trees and bushes, water resources and air pollution from consumption of waste decomposition products, reduction of soil fertility and biodiversity have negative effect on the basin ecosystem and on the living conditions of the population.

## 4. Vision of the Isfara River Basin in Long-term Perspective

Considering the specific features of the Isfara river basin as well as the difficult socio-economic situation, the following long-term vision was proposed:

Vision for the Isfara river basin in 20 years

1. Legislative, economic and institutional conditions shall ensure efficient management and rational use of water resources and the Water Code Principles shall be introduced.
2. Efficient cooperation on joint use of water resources shall be maintained in the territory of the basin on the basis of the Integrated Water Resources Management.
3. Ecological status of the Isfara River water and streams shall be evaluated as “good”.
4. The population shall be fully supplied with high-quality potable water. Farmers shall have equal and timely access to irrigation water.
5. Ameliorative condition of irrigated land shall be evaluated as “satisfactory”, and no processes of land desertification/degradation are to be taking place.

The vision, presented above and implementation of the Basin Plan completely correspond to the National Strategy for Sustainable Development of the Kyrgyz Republic for the period of 2013-2017 and other sectoral documents for development.

## 5. Goals and Objectives of the Basin Plan

The basic goal of the Basin Plan is to ensure the sustainable development of ecosystems, rational use and protection of water resources of the Isfara river basin through implementation of the principles for integrated water resources management subject to possible consequences of climate change and other challenges.

In the context of basin planning the hydrographic principle is accepted, notably the river basin is determined as the water intake territory forming the Isfara River with its streams.

The primary element of the process of the Basin Plan development is the direct involvement of different water users groups in the process. In this connection, the meetings of Working Group for the Basin Planning were held and priority problems were specified.

As a result, the following basic objectives are formulated within the framework of the Basin Plan for the Isfara River:

1. Improving population access to safe potable water in four rural districts (Aksai, Aktatyr, Samarkandek, Karabak) to reduce the population morbidity rate.
2. Improving the water resources management system through the enhancement of water efficiency use and the rehabilitation of irrigation systems up to the Project level.
3. Improving the condition of arable lands through rehabilitation of the existing ameliorative infrastructure – 254.9 km CDS, 36 vertical wells, and 11 gauging stations.
4. Achieving the status “satisfactory” in environment evaluation.
5. Improving the socio-economic condition of the region by means of introduction of new arable lands by using modern water-efficient processes.

## 6. Measures Implementation Mechanism and Sources of Financing

In accordance with the Water Code provisions, following the suggestion of the State Water Administration (Republican level), for coordination of activities regulating water relations, the National Water Council shall nominate and approve the Basin Council for each main basin.

The objectives of the Basin Councils are to develop the Basin Plan and to submit it to the National Water Council, as well as to coordinate activity in water sector within the main basin. The meetings of the Basin Council shall be held not less than once a year.

The relevant Basin Water Administration shall perform functions of the Basin Council Secretariat. As it is evident, the Kyrgyz Republic legislation foresees execution of basin plans for development, use and protection of water resources for each main river basin. Moreover, the State Water Administration shall organize development of any programmes and schedules required for preparation of the basin plans for development, use and protection of water resources and

shall ensure control of their implementation.

It is supposed that the concerned Isfara river basin will be as a sub-basin of the Main river basin. Correspondingly, the Basin Plan for the Isfara River will be considered as an integral part consisting of the General Basin Plan of the Main river basin.

Therefore, the Basin Water Board, Basin Water Administration, State District Administration, Batken District Water Management Department (hereinafter can be transformed as part of the Basin Water Administration), rural councils, as well as other concerned water users organisations and economic entities.

Funding the Basin Plan is to be done from the state and local budgets, funds of existing economic entities, water users, grants of international organisations and donors, sponsor donations and other sources, not prohibited by the legislation of the Kyrgyz Republic.

The volumes of funding of the events shall be specified in the course of the budget formation for the relevant year. In particular, it is planned to obtain detailed elaboration of budget together with preparation of their budget applications for a relevant financial year prepared by every authorised body - members of the Isfara Basin Council.

The specific activities for short-term (2015-2020) and long-term perspective (2021-2035) are stated in two plans. The short-term action plan is attached below.

7. Measures Implementation Plan for Short-term Perspective (2015-2020)					
Objectives	Measures	Responsible persons	Implementation periods	Supposed expenses (mln.soms)	Sources of financing
1	2	3	4	5	6
1. Improvement of population access to safe potable water					
1.1. Institutional measures	<ul style="list-style-type: none"> <li>Development of the programme for modernisation and construction of water supply systems on the basis of inventory and technical condition evaluation</li> <li>Population training in hygiene and sanitary skills, rational use of potable water</li> <li>Development and strengthening of CDWUU</li> </ul>	RWSD, ARIS, A/O	2015-2016 2015-2020 Continuously	No special expenditures Annual budget and project programme	Republican and local budgets, ARIS, international donors
1.2. Economic mechanisms	<ul style="list-style-type: none"> <li>Improvement of the system for setting tariffs for water supply</li> <li>Tightening penalties for use of potable water for household plots irrigation</li> <li>Encouragement of economical use of potable water</li> </ul>	RWSD, A/O, CDWUU, RAEOS	2015-2020 Continuously	No special expenditures	Republican and local budgets, international donors
1.3. Implementation of programmes and projects	<ul style="list-style-type: none"> <li>Monitoring of national, sectoral and local programmes and international projects</li> <li>Promotion of projects in four a/o (Aksai, Aktatyr, Samarkandek, Karabak)</li> </ul>	RWSD, A/O, local administrations Local and central bodies	2015-2020 2015-2016	No special expenditures	Republican and local budgets, target sources of funding by international donors
2. Improvement of water resources management system					
2.1. Institutional measures	<ul style="list-style-type: none"> <li>Ensuring the interaction of all bodies and concerned parties in accordance with approved authorities</li> <li>Promoting the strengthening technical potential of the Basin Council and Water Administration</li> <li>Evaluation and strengthening of potential of water users associations</li> <li>Training of staff and persons involved in water resources management according to thematic plans</li> </ul>	DWE&M, BWMD, Basin Boards, SWRA	2015-2020	Annually	Republican and local budgets, target sources of funding by international donors
2.2. Improvement of the water distribution, water resources assessment	<ul style="list-style-type: none"> <li>Correction of water economy balances in accordance with the current conditions</li> <li>Annual distribution of water consumption limits subject to water content of year</li> <li>Consider priority of automation of water distributions and water resources assessment facilities</li> </ul>	DWE&M, BWMD, DWA Basin Boards, SWA	Every 3 years Annually	No special expenditures	Republican budget



2.3. Enhancement of efficiency of irrigation systems	<ul style="list-style-type: none"> <li>Rehabilitation of the HWIS in the Isfara River and the vertical drainage wells</li> <li>Promotion the strengthening of technical potential of DWA</li> <li>Introduction of improved procedures of O&amp;M of irrigation systems</li> </ul>	DWE&M, BWMD, DWMD	2015-2020	57.6 Annual project programme	Republican budget, target sources of funding by international donors
2.4. Monitoring and evaluation	Participation of the Basin Board in processes: <ul style="list-style-type: none"> <li>Establishment of a unique water information system</li> <li>Development of partnership relations between information exchange services</li> <li>Monitoring and control of water use</li> </ul>	DWE&M, BWMD, DWA, Basin Boards, SWRA	2015-2018 Continuously Continuously	Annual project programme	Republican budget, target sources of funding by international donors
2.5. Safety of settlements	<ul style="list-style-type: none"> <li>Development of measures to assure the safety of the Tortgul Water Reservoir and HWIS on the Isfara River</li> <li>Specification of a list of any human settlements subjected to threats of under flooding, avalanching and mudslides.</li> </ul>	DWE&M, BWMD, MES	2015-2016 Continuously	No special expenditures	Republican budget
2.6. Economic mechanisms	Participation of the Basin Council in the process of introduction of: <ul style="list-style-type: none"> <li>Differential tariffs for water supply services</li> <li>Payment for use of the water as a natural resource and the systems “pollutant shall pay”</li> <li>Economic encouragement of water-efficient processes, reuse of water resources and use of water rotation methods</li> </ul>	DWE&M, BWMD, DWA, Basin Boards, SWA	2015-2020	Annual project programme	Republican budget, target sources of funding by international donors
3. Improvement of meliorative condition of arable lands					
3.1. Technical conditions	<ul style="list-style-type: none"> <li>Implementation of research for prioritisation of meliorative works</li> <li>Development of short-term programme for complete renovation of project parameters CDS on the basis of research works</li> <li>Development of annual plans on CDS cleaning, following the “system approach” principle</li> </ul>	DWE&M, HGME, HGME, HGMT	2015-2016 2015-2016 Continuously	0.370 No special expenditures No special expenditures	Republican budget
3.2. Capacity building of management	<ul style="list-style-type: none"> <li>Assisting in the strengthening technical equipment of the meliorative group of DWA</li> <li>Advance training of specialists of the DWA meliorative group under the auspices of the Kyrgyz Irrigation Research Institute</li> <li>Prepare proposals for purchase of drain-washing machine</li> </ul>	DWE&M, HGME, DWE&M, HGME, HGMT, DWA, HGME, HGMT	2015-2020 2015-2020 2015	5.2 - -	Republican budget, target sources of funding by international donors

3.3. Monitoring and evaluation	<ul style="list-style-type: none"> <li>Rehabilitation of operational network of observation wells</li> <li>Monitoring of improvement of meliorative cadaster maintenance</li> <li>Evaluation of meliorative condition of irrigable lands according to the approved methodology</li> </ul>	DWE&M, HGME HGME, HGMT HGME, HGMT	2015-2020 Continuously Continuously	3,8 No special expenditures No special expenditures	Republican budget
4. Achievement of "satisfactory" status of the environment					
4.1. Compliance with boundaries of water protective zones and belts	<ul style="list-style-type: none"> <li>Initiating the process of inventory accounting of water protective zones and belts</li> <li>Assisting in preparation of proposals for state registration of water protective zones and belts</li> <li>Ensuring the regime of water protective zones and belts</li> </ul>	DWE&M, SWRI, State Register SWRI, BWMD, DWA	2015-2020 2015-2020 Continuously	- 1.3 (only for large water economy facilities) -	Republican budget
4.2. Provision of sanitary passages	<ul style="list-style-type: none"> <li>Periodic analysis of required volume of sanitary passages</li> <li>Control over compliance with the sanitary passages</li> </ul>	BWMD, DWA SWRI, SWRA	On a permanent basis	No special expenditures	Republican budget
4.3. Prevention of water pollution	<p>Raising the issues in the following directions:</p> <ul style="list-style-type: none"> <li>Construction and reconstruction of sewage systems, waste disposal plants of public-service and industrial facilities</li> <li>Cleaning and decrease in waste and collector-drainage water disposal</li> <li>Minimisation of water object pollution with household wastes on the part of population</li> </ul>	Local executive bodies, Batken TEPFMD, DWE&M	2015-2020	Annual budget program	Republican and local budget
4.4. Improvement of environment condition	<p>Development of recommendations in the following directions:</p> <ul style="list-style-type: none"> <li>Management the use of grazing lands for cattle</li> <li>Development of natural forest development and human settlements planting</li> <li>Strengthening control over poaching</li> </ul>	A/O, Pasture committees, Batken Forestry Management, Batken TEPFMD	2015-2020		Republican and local budget
5. Development of new irrigable lands					
5.1. Introduction of new irrigable lands	<ul style="list-style-type: none"> <li>Completion of preparation of FS, DED and construction and assembly operations (CAO) on reconstruction of canal "P-4"</li> <li>Completion of preparation of FS, DED and CAO on construction of BSR facility in the Ravat village</li> <li>Consider alternative options on water supply</li> </ul>	DWE&M, Directorate for construction of water economy facilities	2014-2019	250.0 60.0	Republican budget

