



**INTEGRATED WATER RESOURCES  
MANAGEMENT IN FERGANA VALLEY**



**SICWC**

**IWMI**  
INTERNATIONAL WATER  
MANAGEMENT INSTITUTE



## **Project** **“INTEGRATED WATER RESOURCES** **MANAGEMENT IN FERGANA VALLEY”** **(IWRM-Fergana)**

### **Project’s Executors:**



International Water  
Management Institute  
(IWMI)



Scientific-Information Center of  
Interstate Coordination  
Water Commission of  
Central Asian States  
(SIC ICWC)

### **Financial support:**



Swiss Agency for Development  
and Cooperation  
(SDC)



 **Foreword**

In February 2002 the Swiss Agency for International Development and Cooperation (SDC) and the ICWC signed a credit proposal for beginning an implementation phase of a project titled "Integrated Water Resources Management in Fergana Valley (IWRMFV)". On April 16, 2002, the IWMI and SIC ICWC signed an association agreement, with IWMI as a leading partner of the association. Subsequently, IWMI then signed for the association a contract for the execution of the project with Swiss Cooperation Office (COOF) in Bishkek, Kyrgyzstan.

The project activities are being carried out along three main canals: Aravan Akbura Canal in Osh Province of the Kyrgyz Republic, South Fergana Canal in Andijan and Fergana Provinces of Uzbekistan, and Gulya-Kandoz Canal in Sogd Province of Tajikistan. The Project has established a field office and Branch of ICWC Training Center in Osh in the Kyrgyz Republic to provide support for implementation of activities in pilot areas, including training of Water Users Associations (WUAs) specialists and farmers within the Fergana Valley. The results of the project will be disseminated all over the Fergana Valley during the implementation (2002-2005).



**Kamchik pass - highway  
to Fergana Valley from the West**



## PROJECT AREA - THE FERGANA VALLEY

Fergana Valley is located in south-western part of the Tien Shan mountain system, where the glaciers and snow melt to form the Naryn and Karadarya rivers. Both rivers flow join to form the Syrdarya.

Climatically, the Fergana Valley belongs to the central cotton zone of Central Asia (CA). Its western and central parts are deserts with low precipitation. In the submountain parts of the valley the rainfall increases, resulting in a humid spring.



**Syrdarya - main water-way  
in Fergana Valley**

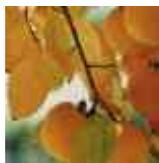


## History of Irrigated Agriculture in the Valley

Fergana Valley is an ancient oasis where the age of irrigated agriculture and civilization, along with India, Egypt, China, the Middle East, is estimated at several millennia. From times immemorial, a large intermountain valley, cut by the Syrdarya in the middle, was a favorable place for settled farming and the most ancient culture of local tribes.

By the beginning of Soviet era the valley, a set of separated irrigation systems located along the Syrdarya tributary talus trains, was developed. Between them huge areas of virgin lands of Central Fergana were located. These systems were poorly provided with water.

At the end of the 1940s, the Soviet government built a large-scale work to change water delivery circuit in the Fergana Valley. The goal was to construct the network of canals, engirdling the valley from two sides and simultaneously equalizing water supply to all irrigated lands. The canals such as Savay, Big Fergana, South Fergana, North Fergana, Akhunbabayev, Big Andijan and Big Namangan were constructed. By 1985 the main reserves of the Fergana Valley's fertile lands had been almost completely brought under irrigated agriculture.



**Fergana Valley gifts**

As such, the Fergana Valley was transformed into one of the most populated regions in Central Asia. The population density and rate of development are very high, causing demographic stress, as practically no migration of rural population takes place.

After the collapse of the Soviet Union, the economic growth slowed down and the complex irrigation systems were gradually falling into deferred maintenance, as there was no subsidy 'from the center' and the newly independent states were lacking proper funds. As a result, the income of agricultural producers and their potential to maintain water management network sharply decreased. This also led to lack of regulatory control of the system and increase of unproductive and organizational losses, as well as sharp reduction of available water to irrigated lands.

Therefore, the solution for socio-economic problems in the Fergana Valley is a substantial increase of water and land productivity along with expansion of industrial production.

**TABLE**  
**Main indicators of socio-economic development in Fergana Valley**

Indicators	Region/state		
	Kyrgyzstan	Tajikistan	Uzbekistan
Territory, ha	6,408,000	699,000	1,946,000
Area suitable for irrigation, ha	341,000	197,000	1,001,000
Actual irrigated area in 2000, ha	330,700	133,900	911,300
Population, inhabitant	2,489,600	1,904,000	6,867,200
including rural	1,922,200	1,245,000	4,689,000
Population density, inhab./km <sup>2</sup>	38.9	272.4	352.9
Amount of irrigated lands per capita in rural area, ha/head	0.17	0.11	0.19
Total volume of water diversion from sources, billion m <sup>3</sup> (2000)	2.6758	1.7289	10.1611
Total volume of water supply at farm border in 2001, billion m <sup>3</sup>	2.1551	1.3910	7.9311
Water disposal via collector-drainage network, % of water diversion	28.6	38.9	37.3



## Recent water situation

The main river - Syrdarya - represents about 70% of all Fergana Valley water flows; her tributaries bring nearly 30% of the flows to the valley.

Total volume of water available on the territory of the valley is between 14 and 15 km<sup>3</sup> a year. The share of Uzbekistan is 69.7%, that of Kyrgyzstan is 18.5% and that of Tajikistan stands at 11.8%, respectively.

For the most part the valley has favorable soil conditions: nearly 85% of lands are non-saline and/or weakly saline, with only 15% of lands unfavorable for irrigation (due to high groundwater level or salinity).

As a whole, water resources would be adequate to provide water for all water uses in Fergana valley, largest being the irrigated agriculture. There is also opportunity to re-use drainage flow, which usually is of a good quality considering the irrigation standards.



**Water metering device in the field,  
farm "Navoi" in Fergana province**

Water quotas for the states, administrative provinces and main canals (all hierarchy levels) are taken into account during allocation of limits, depending on the actual water availability for the year.

Nevertheless, under the prevalent water scarcity conditions the need and the current practices of water allocation must be better analyzed and reorganized. In other words, it is necessary to assess the demand and supply, so that the situation becomes more clear and transparent for water users and key stakeholders.

The Soviet period of the command system left a legacy of under-funded multilevel bureaucratic structure of water management. Formerly, the government was the driving force for development. Rural population was only a final user whose well-being depended on unified water supply quotas and regulation of agricultural production, which was again established by the government. Water management bodies were not accustomed, until recently, to acknowledge the initiative and participation of the public and rural community in solving water management issues. Usually, mutual accountability towards a policy at the various levels of management hierarchy is absent, competence of executive management bodies is poor, and actions of operational personnel do not meet water users' requirements fully. As a rule, water and other natural resources management bodies are functioning within administrative boundaries, not taking into account the hydrographic boundaries, affecting negatively the productivity and environment..

In summary, the administrative system of water management is unable to cope with inter-sectoral, dynamic and versatile character of current water management problems. Therefore, the situation calls for integrated water resources management in the region.

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**Meeting with Omoyjon Kholbekov,  
the Khokim (Major) of Kuva district,  
on pilot WUA creation issues**



## THE OPPORTUNITIES FOR IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT PRINCIPLES



### What does it mean - integrated water resources management?

Water resources management is a skill to deliver required quantity of water with an admissible quality to the required place in specified time using organizational and technological framework and other resources in a sustainable manner. Integrated Water Resources Management for the project purpose would be operationalized as:

**system that bases on accounting all potential water sources, coordinating inter-sectoral interests and all levels of water use hierarchy, hydrographic method, widely involving all water users and rational water resources use, and ensures ecological security and sustainable water supply to society and nature.**

For putting such a concept into practice, "reform" of water resources management organizational structure and identification and implementation of appropriate regulations, functions and commissions for each structural level of water supply are needed. Also, it is necessary to clearly formulate how, by whom, at what costs, and under what terms water supply services will be provided to water users, along with simultaneous improvement of water productivity.



**Water metering device in farm "Nursultan Aly", Osh province**

What can be achieved as a result of integrated water resources management principles implementation when compared with the existing system:

The obstacles of the existing water resources management system	Benefits from integrated water resources management
Water resources management entities operate under different authorities and without inter-sectoral coordination	Inter-sectoral coordination mechanism exist (by creating water councils National, Basin, System)
Management is on basis of administrative boundaries (parochial egoism in water resources use)	Management is based on hydrological boundaries (sustainable and equitable water supply guarantee regardless of water user spatial/administrative location)
Significant 'organizational' water losses due to non-coordinated managerial actions at various hierarchy levels exist	Minimization of organizational water losses through clear and transparent coordination of actions at all management hierarchy levels
Frequent contradictions between water policy, water law and management regulations	Integration of water policy, legislation and management rules
Fixed managerial procedures from top down	Flexible legislation reacting to dynamically developing conditions (democratization and transition to market economy)
Bureaucratic multilevel structures, insufficiently financed from the center	Mainly self-financing organizations with partial state budget for water resources development
Uncertainty of real financial expenditures for water supply services	Planning tools and payment on the basis of real expenditures for services
Absence of correlation between service provision and payment	Realization of principle "payment for service". Service payback mechanism.
Absence of incentives to water conservation as well as water productivity	Recognition by all society members that water is scarce resource. Provision of incentives to water productivity increase and water conservation
Uncertainty of real expenditures owing to unsatisfactory hydrometry	Development of hydrometry. Precise water supply and diversion account
No participation of many interested parties and users in decision-making	Consultations with the public, involvement of all key stakeholders in decision-making
Absence of accountability to service beneficiaries (water users)	Management is fulfilled with the participation of all stakeholders, services are rendered on contractual basis
Apartness of water users and their weakness (juridical and economic)	Water user associations as juridical bodies have clearly defined rights and duties in relationship with water entities



## Project goal

The main goal of the project is to improve rural population livelihoods by demonstrating on a pilot scale the integrated water resources management in Fergana Valley. This means also achievement of greater social harmony during on-going agricultural reforms in the states of the region.



## Basic project tasks

1. To propose different aspects of water management improvement and to demonstrate the ways towards integrated water resources management by evaluating elements of this concept on specific sites in Fergana Valley, with participation of water sector specialists and water users. In other words, the objectives are to demonstrate usefulness of possible measures for reforming the water sector in Central Asian countries and show how the principles for IWRM can be applied.
2. To demonstrate real opportunities for water and land productivity increase.



WUA "Japalak" office, Osh city, Kyrgyzstan



## Expected results of the project

1. The agreed-on concept of water management improvement in Fergana Valley applying the principles of integrated water resources management.
  2. New institutional framework for water management with participation of all stakeholders.
  3. Development of Water User Associations - as a form of self-managed organizations of water users, responsible for lowest level of the system, enabling development of new relationship between water users and water managing entities.
  4. Capacity building: (i) for water management staff of different entities; (ii) for WUAs professional staff; (iii) for creating a communication network for all participants; (iv) developing an information system and a set of models.
  5. 'A prototype' of a flexible legal base, regulating the implementation of water management improvements concept through pilot objects.
  6. Measurement system, ensuring sustainable and equitable water supply (tools - models and recommendations for water use plan design and their adjustment).
  7. Demonstrating all opportunities for water conservation and water and land productivity increases.
  8. Concrete proposals and recommendations to decision-makers for replication and upscaling, based on project results.
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**Cotton cultivation under polyethylene film,  
March 2002, Fergana oblast**



## PILOT OBJECTS

Reforms and search of new institutional solutions are implemented on pilot irrigation systems in:

- Kyrgyzstan - on Aravan-Akbura Canal;
- Tajikistan - on Gulya-Kandoz Canal;
- Uzbekistan - on South Fergana Canal.

Key partners for organization (Uzbekistan, Tajikistan) and development of the existing WUAs (Kyrgyzstan) are:

- WUA "Japalak" in Karasuy rayon of Osh oblast (Kyrgyzstan), with total cultivated area of 2,012 ha along with two other WUAs ("Janaryk" with command area of 1,006 ha and "Akbuura" - 2,048 ha) will be united on Aravan-Akburi Canal.
- Former collective farm "Bobo Khamdamov" (Tajikistan), divided into 11 dekhkan farms (with total area 1,092 ha), forms WUA along "Bystrotok-Akkala" Canal.
- Shirkat farm "Navoi" in Kuva rayon of Fergana oblast (Uzbekistan) with total area of 2,311 ha and 21 private farms with area of 330 ha form WUA along the system of two canals - "Akbarabad" and "RP-1".

For the result, concerned with water conservation and water and land productivity improvement, key partners are the following farmers or shirkat farms:

- in Kyrgyzstan: private farm "Sanduk" at WUA "Akbuura" (Aravan rayon of Osh oblast) with total area of 30.3 ha; private farm "Nursultan Ata" at WUA "Japalak" (Karasuy rayon) with total area of 6.5 ha; private farm "Toloykon-2" at WUA "Janaryk" (Karasuy rayon) with total area of 16 ha.
- in Tajikistan: private farm "Gadoyboyev" at collective farm "Bakhoriston" (Gafurov rayon of Sogd oblast) with total area of 128 ha; private farm "Sayed" at collective farm "Bobo Khamdamov" (Rasulov rayon) with total area of 93.9 ha; dekhkan farm "D-Khoz-21" at former collective farm "Samatov" (Rasulov rayon) with total area of 104 ha.
- in Uzbekistan: private farm "Turdali" at shirkat farm "Navoi" (Kuva rayon of Fergana oblast) with total area of 10 ha; private farm "Nozima" (Tashlak rayon of Fergana oblast) with total area of 12 ha; private farm "Khojal-Ona-Khoji" at shirkat farm "Niyazov" (Akhunbabayev rayon) with total area of 12 ha; and private farm "Tolibjon" at collective farm "Djura-Polvon" (Bulakbashi rayon) with total area of 10 ha in Andijan oblast - South Fergana Canal upstream.

## PROJECT EXECUTORS

The partners of the Association appointed project co-managers (Mehmood ul Hassan from IWMI and Vadim Sokolov from SIC ICWC) to organize and supervise implementation of the project activities and manage the finances. Mr. Alisher Satybaldiyev, representative of Osh oblast basin organization directs the project field office and Training Center in Osh city (Kyrgyz Republic).

While IWMI provides guidance and knowledge base from the international experiences, the key specialists from SIC coordinate the majority of local field works to achieve the planned results: Dr. Kim Belotserkovskiy - activity on reorganization of water management, Dr. Miyer Pinkhasov - activity on WUA development, Dr. Shukhrat Mukhamedjanov - activity on productivity improvement at farm level, Dr. Alexander Tuchin - development of database and modeling.



**Urs Herren**  
Head of the Swiss CCOF  
in Bishkek



**Johan Gely**  
SDC Project Coordinator  
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**Workshop in ICWC Training Center Branch in Osh city**



**Asiradin Kichibayev**  
National Project Coordinator  
for Kyrgyzstan



**Akhatjon Akhrorov**  
National Project Coordinator  
for Tajikistan



**Umarkhon Azimov**  
National Project Coordinator  
for Uzbekistan

Participatory specialist staff in three national water agencies and at oblast level was selected by "tendering" process. Local executors are recruited for project activities on contract basis, according to individual Terms of Reference.



**Structure on PK-70 of Aravan-Akbura Canal,  
Osh province**



## **FUTURE OUTLOOK- POTENTIAL DEVELOPMENT OF THE PROJECT**

It can be expected, that the implementation phase will result in democratically elected two pilot Water Users Associations (one each in Uzbekistan and Tajikistan pilot sites) managing their respective irrigation and drainage systems, and a Water Users Federation managing Aravan Akbura Canal, and Canal Management Councils managing South Fergana and Gulya-Kandoz Canals. This work will generate recommendations for establishing similar organizations for all the irrigation systems across the valley, considering the political, social, economic and administrative functions. Such arrangement would be expected to enable effective water resources management and provide modern water services to various water users. In addition, all water managing organizations are expected to be provided with essential knowledge and effective tools for management of their respective systems to increase the water and land productivity and therefore create a 'water saving' to be utilized elsewhere.

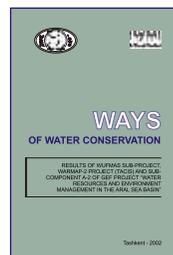
Water management is effective when water used produces a maximum benefit and water is equitably distributed within the hydrographic boundary amongst various needs and levels of society, while maintaining the vital ecosystems. Key goal of the project - creation of new institutional and technical structure, which will enable groups of people with different interests to peacefully agree and coordinate actions on water use regardless of administrative boundaries and bureaucratic interests - should be achieved.

In connection with the above, the future development of the project would be directed to strengthen and unify the management of water infrastructure within hydrographic borders of each pilot canal in Fergana Valley. It can be expected that improvement will be reflecting on:

- Legislative base that regulates water resources management system;
- Economic tools and financial regime (market relations, prices, credits, investments);
- Capacity building and strengthening of potential of new management system (communications, information exchange, model planning and analysis tools, training);
- Improvements in the organizational set-up, jointly with Water User Associations (removing bureaucratic barriers, mutual responsibility);
- Technical development (SCADA, water allocation automation along main canal that will lead to reduction of water losses and water supply equity, further enhancement of water conservation and water productivity at various levels);
- Distributing the experience from the pilot objects over Fergana Valley and in the future - all over Central Asia.



## Water Conservation Ways



In 2001 SIC ICWC with the active participation of IWMI published the monograph "Water conservation ways (the results of works on WUFMAS Subproject of WARMAP-2 Project (TACIS) and Subcomponent A-2 of GEF Project "The Aral Sea basin water resources and environment management".

As it follows from the subtitle, the monograph contains the main results of two projects:

- WUFMAS (water use and agricultural production management), performed in 1996-1999 under TACIS Program;
- A-2 (Participation in water conservation) of the World Bank, performed in 1999-2000 under the GEF Project (The Aral Sea basin water resources and environment management).

The essence of these materials concerns water conservation problems at "on-farm" level, which seems the most sensitive for the on-going socio-economic reforms in Central Asia. The first part contains: (i) evaluations of monitoring, carried out by WUFMAS Subproject for the purpose of receiving the current status and (ii) the results of practical realization of recommendations towards improving the effectiveness of irrigation water use in demonstration fields. It was showed that only comprehensive approach could achieve an increase of irrigation water productivity along with high crop yields.

The second part presents a review of the main results of "Water conservation" competition - stage II, held in 1999-2000 in eight oblasts in the Aral Sea basin. The significance of this competition is in discovering traditional water conservation methods and water user initiatives, which don't require large-scale capital investments and can be recommended to wide distribution in the Aral Sea basin irrigation zones.



## Additional information on the project

on web-sites [www.icwc-aral.uz](http://www.icwc-aral.uz) [www.iwrm.icwc-aral.uz](http://www.iwrm.icwc-aral.uz)



in "Press Release of ICWC"



in "ICWC Bulletin"



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