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Participatory water management at the main canal: A case from South Ferghana canal in Uzbekistan

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ABSTRACT

After the independence of Central Asian countries, many international projects have been launched to promote water users' inclusion into the water management at different levels. The aim of such projects is to achieve sustainable water management through inclusion of interests of different groups on day-to-day water management. Although IWRM in Central Asia has been already promoted for a decade, there are only a few examples of the implementation in real life situations.

The Integrated Water Resources Management in Ferghana Valley (IWRM FV) is a pilot project on implementing integrated water resources management elements at the main canal levels and below. The experience gained from IWRM FV project and lessons learnt could be useful for the national and international organizations for their future work on IWRM implementation at the different regions of Central Asia.

IWRM FV project has been active since 2001 in the Ferghana Valley, one of the largest irrigated areas of Central Asia. The project has promoted and implemented participatory irrigation management for three pilot canals. This paper presents the process of implementation and some preliminary outcomes of the IWRM VF project.

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1. Introduction

Contemporary water problems in Central Asia are the result of both inefficient water infrastructure as well as weak water management institutions (Dukhovniy and Sokolov, 2005; Spoor, 2004). Therefore, institutional interventions to improve water management, especially for irrigated agriculture are a pre-requisite for increasing the productivity of limited water resources, and increasing the productivity of agriculture in the region.

1.1. The water management history: change of paradigms

The water management is a political process and a part of the overall development path of the countries and regions.

Therefore, a brief look into the history of water sector development would help to understand the past trends and develop plans for improving the water sector. According to Allan (2006), the water sector development in semi-arid countries can be divided into five paradigms. There is contentious discourse on water sector development of the developed world and the developing world. At present, the developed world is in reflexive modernity stage and has given the hydraulic mission paradigm on water sector development to more IWRM (Integrated Water Resources Management) paradigm. Contrary, most of the developing world is still continuing with hydraulic mission as main paradigm on water sector development (see Fig. 1).

The discourse on water paradigms of developed and developing world is outcome of different priorities of those

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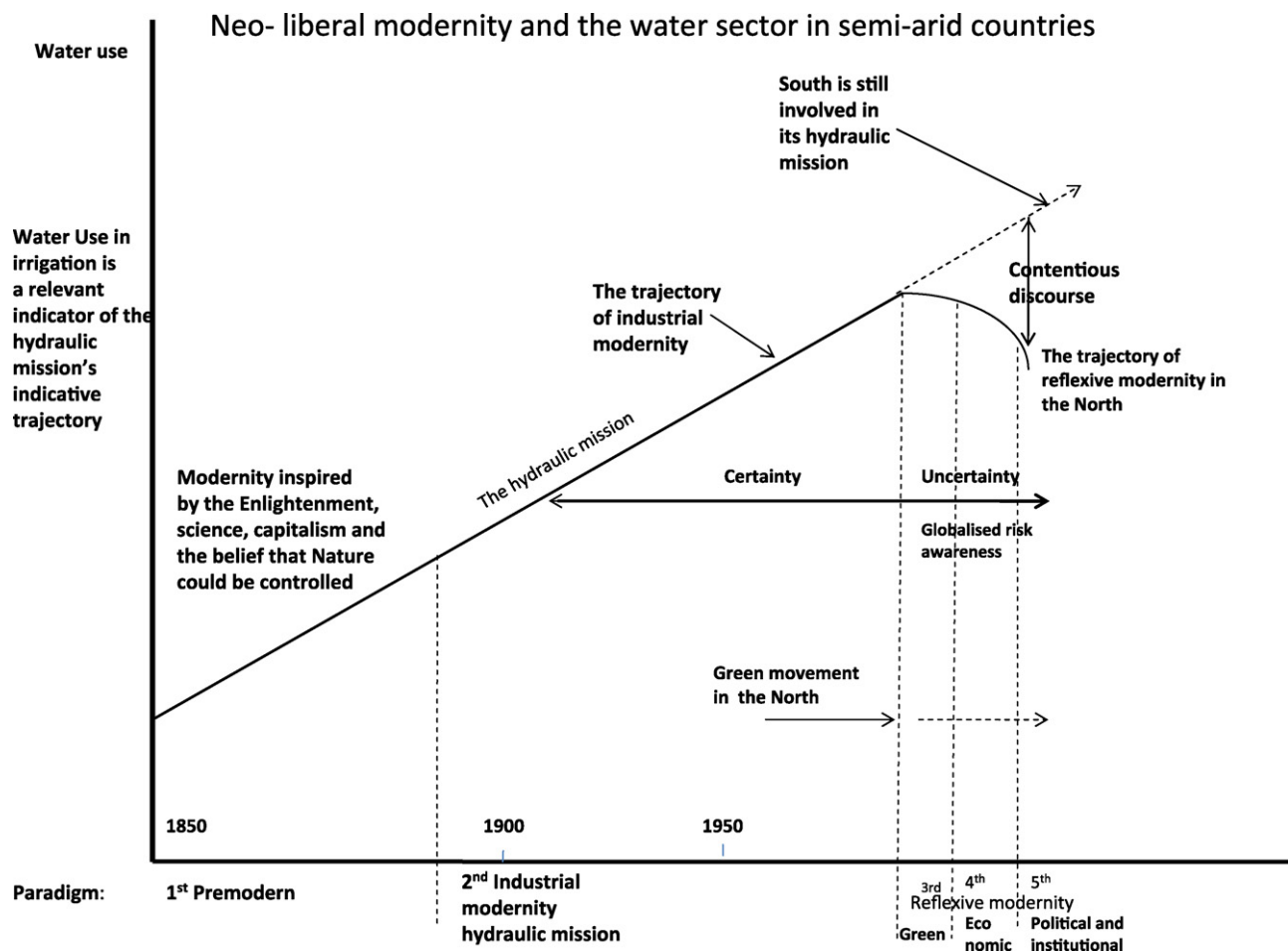


Fig. 1 – The five water management paradigms, 1850–present (source: Allan, 2006).

two systems. The political, economic and social developments in developed world in the last century has progressed very well. Therefore, water sector development, nowadays, concentrates more on sustainable development with focus on

societal, economical and environmental sustainability. In the developing countries, the societal and economic concerns are overwhelming; therefore the hydraulic mission paradigm is still leading policy there. The hydraulic mission in plain terms

Table 1 – The history of the five water management paradigms in Central Asia.

Water management paradigm	History
Paradigm 1	Until mid-1930s, mainly subsistence agriculture, decentralised and small scale cotton production and small irrigation schemes
Paradigm 2	Starting mid-1930s, collectivization, rehabilitation of irrigation systems, development of new irrigated schemes, "great desert irrigation" projects, large-scale cotton production
Paradigm 3	Mid-1980s, mainly due to Gorbachev's perestroika intelligentsia and local environmental movements brought Aral Sea problem discussions into the public. Although few changes were made such as imposing "limits" reduced water supply for irrigation overall policies have not changed in water management
Paradigm 4	1991, right after the independence, the Central Asian countries started to realize structural reforms with the aim to increase economic performance of the all sectors. In agriculture collective farming was replaced by individual farms, service fees were uplifted for communal and industrial water use and introduced for irrigation sector. The economic rational has been central for many changes
Paradigm 5	Starting 2000-2001, the Integrated Water Resources Management (IWRM) has become popular idea among the water professionals and researchers in Central Asia due to its strong promotion by the international organizations. Since mid-1990s, the international donors such as UNDP, World Bank and Asian Development Bank, Swiss Development Cooperation has launched few initiatives in different Central Asian countries for the promotion of IWRM principles. The centerpiece of those projects is to prepare the national road maps on IWRM implementation for the Central Asian. However, the process is not owned by local policy makers

means that the humans can control the nature through technical and technological means, e.g., construction of new water systems such as water reservoirs, canals, and hydro electrical stations. In this development stage, the development path is determined by state agencies and funds.

The Central Asia, being a part of the former Soviet Union has been little different path of water sector development (Table 1). The hydraulic mission was a central paradigm of water sector development until mid-1980s. The large-scale land development projects were funded, constructed and managed by the state budget, by state organizations. Gorbachev's "perestroika" has helped to increase public awareness and pressure on environmental issues such as Aral Sea problem. The Central Asian water sector has shifted from hydraulic mission into 3rd paradigm – environmental paradigm. However, follow up social-economical "revolution" after the collapse of Soviet Union has brought more economic paradigm into the water sector development of Central Asia. The increase or introduction of water fees for different sectors, more economy based relations between neighbouring countries has been convincing elements of economical paradigm of water management.

Since mid-1990s, the international development agencies started to promote IWRM principles in Central Asia, paradigm 5 which looks river basin as fundamental hydrologic unit and water management as political process started to gain momentum in Central Asia. Although IWRM has been centerpiece of many official documents on water sector development in Central Asian countries, the paradigm has not become a part of the agenda of national and local policy makers on water sector.

Starting from mid-1990s many projects have been initiated in water sector with similar objectives on promoting institutional changes, such as support to WUAs, participatory irrigation management, implementation of IWRM (WUASP, 2005, ADB, 2005, and WB, 2003). The pilot project Integrated Water Resources Management in Ferghana Valley (IWRM FV) project is one of such projects with aims to improve water

resources management in Central Asia. The next section presents short description of IWRM FV project.

1.2. Integrated Water Resources Management in Ferghana Valley – pushing IWRM paradigm for Central Asia

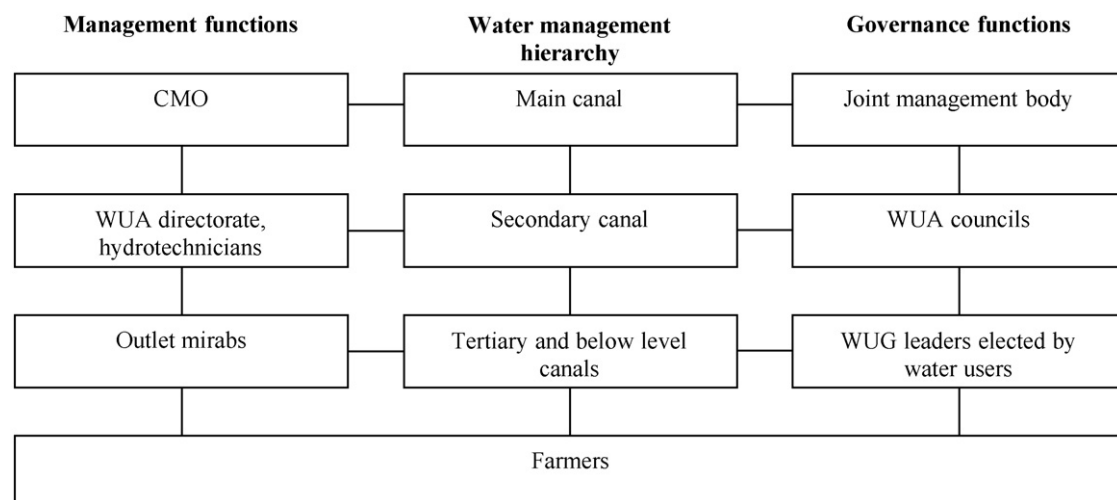
IWRM FV project is funded by Swiss Development Cooperation (SDC) and implemented by association of two partners, namely Scientific Information Center (SIC) of Interstate Coordination Water Commission (ICWC). The project is implemented in Ferghana Valley part of Kyrgyzstan, Tajikistan and Uzbekistan. The project started in 2001 and has been prolonged to three phases. Recently SDC decided to prolong IWRM FV project to a fourth phase, commencing in 2008. The objective of the IWRM FV project is highlighted in its website as follows:

"...by broadening and deepening institutional, legal and managerial IWRM principles and practices in selected areas of the Ferghana Valley to achieve real public participation on all levels of water hierarchy, and managerial and financial sustainability. It will improve land and water productivity and equal and efficient water use in a broader scale and achieve poverty alleviation and environmental sustainability..." (visited at 15th August, 2008, http://iwrn.icwc-aral.uz/aim3_en.htm).

The specific objectives of the IWRM FV project for third phase (2003–2008) was highlighted as following by external review mission of the project (SDC, 2007):

- (1) Modern water governance policies and management procedures as well as appropriate institutional arrangements are made fully functional at all selected pilot canals.
- (2) Improved irrigation management practices and more productive use are achieved.

The IWRM FV project has been promoting separation of the governance and management function in water management for whole hierarchy, starting from tertiary and below level canals up to state-managed main canals (Fig. 2).



Note: WUA- water users associations, WUG- water users groups

Fig. 2 – Water governance and management structure proposed by IWRM FV project (source: Manthritilake et al., forthcoming).

The water sector program of SDC (IWRM FV project's only donor) for Central Asia states as its main focus to support "...to water sector management, with the aim of fostering integrative, accountable and inclusive institutions leading to political stability.... Switzerland will reinforce and expand activities in integrated water resource management, focusing on policy, regulatory, institutional, organizational and managerial issues combined with infrastructure improvements including inputs into automated, user-based water metering and payment as well as into the technical improvement of primary canal systems" (visited 15th August, 2008, website of SDC:

http://www.swisscoop.uz/en/Home/Regional_Strategy/Water_Management_and_Disaster_Risk_Reduction). As one can see the objectives of the IWRM FV project are direct outcome of the SDC water sector program in Central Asia. Therefore, IWRM FV project is typical of donor driven projects with the aim of creating "sustainable water management practices" in the region. Since 1990s, international organizations have been active on the reformation of water sector in Central Asian countries. IWRM FV project promotes inclusion of water users on water management at the main system level where state-funded water management organizations (WMOs) are responsible for all aspects of water management.

This was quite revolutionary step, although was promoted by an external donor agency. The focus of this paper is to present the process of implementation of water users' inclusion on water management at the main canal level promoted by IWRM FV project and describe successes and failures of the this innovation.

2. Methods and materials

2.1. Project area: Ferghana Valley and South Ferghana canal

The Ferghana Valley is located at the southeast of the Central Asian region and the eastern part of the Aral Sea Basin. It is almost entirely surrounded by mountains (the Ala-Tau Range in the North, the Tian Shan Mountains in the East and the Alai Mountains in the South), with the exception of the narrow western opening through which the Syr Darya River drains into the lower basin of the Aral Sea. The larger central part of the valley falls within the Republic of Uzbekistan, while the northern and eastern fringes are located in the Kyrgyz Republic and a small area in the valley's west and southwest belongs to the Republic of Tajikistan (Fig. 3).

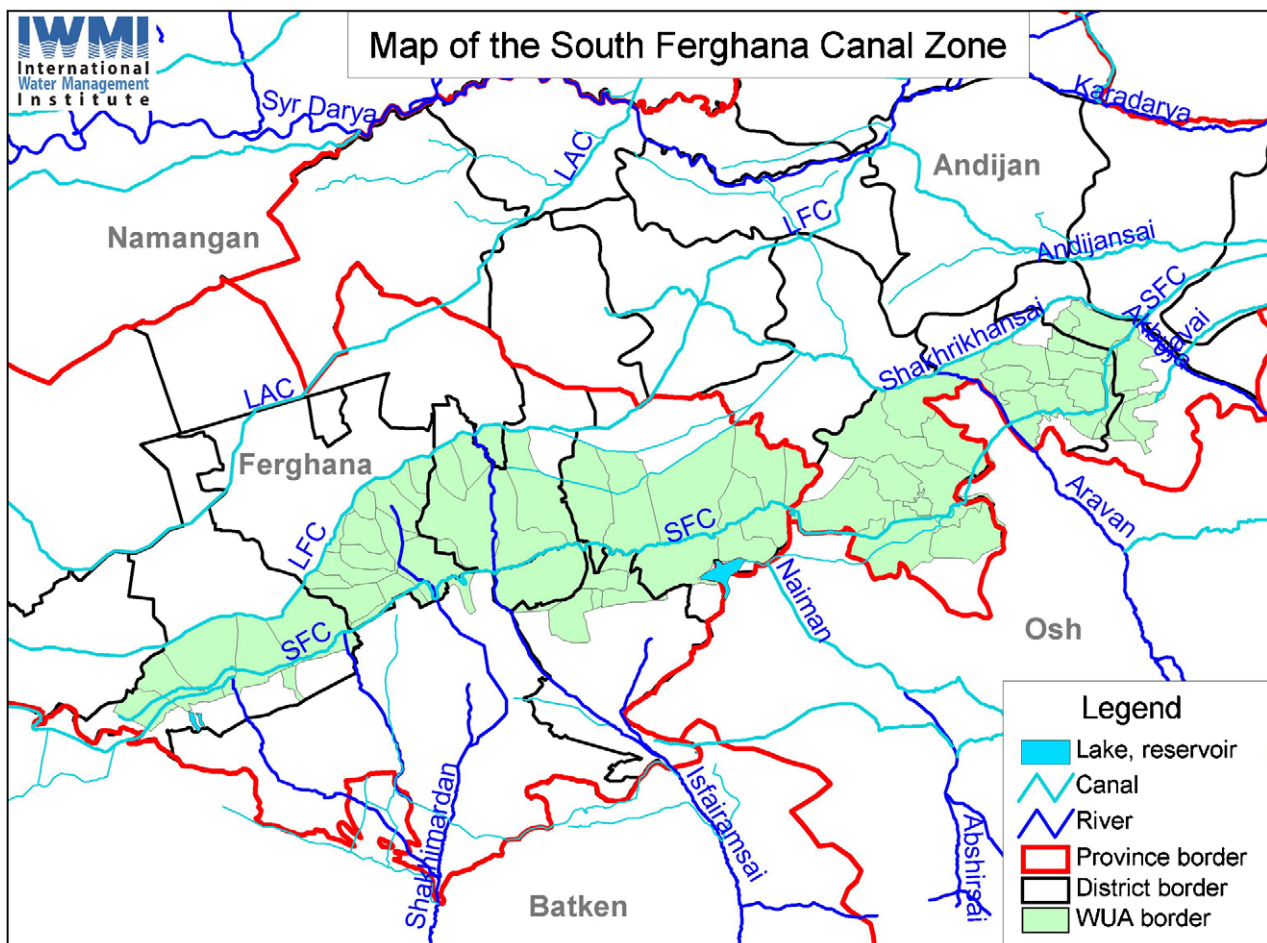


Fig. 3 – Map of the Ferghana Valley.

The Ferghana Valley forms the upper to mid-reach of the Syr Darya River Basin, which flows from the confluence of the Naryn and Kara Darya rivers.

The average temperature in the valley is 13.1 °C, ranging from –8 °C to 3 °C in January and 17 °C to 36 °C in July. Annual precipitation ranges from 109 mm to 502 mm, whereas evaporation ranges from 1133 mm to 1294 mm throughout the Ferghana Valley. The long-term (1970–2000) average annual precipitation for the South Ferghana Canal (SFC) command area is 175 mm. During the study period (1999–2004), precipitation rates were mostly higher than the long-term average, with the highest value of 330 mm in 2003 and the lowest of 150 mm in 2000. The effective precipitation rates amount only to 15–20% of the totals, because they occur in winter, when only winter wheat is grown, due to low temperature, and little is stored in the soil through the start of the crop season.

SFC is located in the south part of the valley (Fig. 3) and was built in 1936 and then reconstructed and extended in 1940. The SFC is 142 km long, with 60 km located in Andijan Province of Uzbekistan and 82 km in Ferghana Province. It is lined from head to tail and receives water from Andijan reservoir. The head discharge of the canal is 92 m³/s. The total irrigated area under the SFC command is 96,215 ha of which 26,983 ha are located in Andijan Province and 53,155 ha are in Ferghana Province and rest is in Kyrgyzstan. The Karkidon Off-Channel Reservoir is used during the irrigation season as an additional source of water supply to SFC.

2.2. Field research methodology

The main aim of the field research was to capture and document the changes in water management at the different levels due to the IWRM FV project interventions. The research was conducted in each pilot canal. The data collection and field research were based on exploratory and documentary methods, which include semi-directive, non/semi-structured

and group interviews with main actors, studying of project reports, data bases, research publications, archives and mass-media materials on both subject and area of interest. For systematizing purposes, the research techniques are divided into four groups: (1) surveys, (2) studies, (3) participation and observation, and (4) expert knowledge generation (Fig. 4).

2.3. Surveys

Walkthrough survey of water management practices and the state of water infrastructure is the starting technique applied by authors. After rapport building meetings with WMO, WUAs' staff and water users, researchers have conducted walk/drive through the main irrigation canals of the WUAs, Water Management Organizations – WMO (main canal). The researchers should have mapped the area/irrigation system. The goals of the walk/drive through surveys were manifold: updating maps, understanding irrigation network, getting known to the community, becoming familiar with technical system and noting down irrigation and water use practices of the location.

Data surveys: researcher(s) have developed a list and protocol for the secondary data they need and have contacted WUAs and WMOs for collecting readily available quantitative data. The secondary data helped to understand the main features of the irrigation system, WUAs, and WMOs. However, one should realize that the quality of the secondary data in most cases was low. The secondary data have included information on biophysical characteristics of the locality, data on water inflow, outflow, specificities of the irrigation and drainage system, etc.

Interviews and questionnaire surveys: a series of interviews have been conducted with CMO, WUA leadership and irrigators in the location. *Strengths, Weaknesses, Opportunities and Treats (SWOT) and institutional analysis* were applied for the analysis of WUAs and WMOs (e.g. canal management organization) in order to get information and understanding

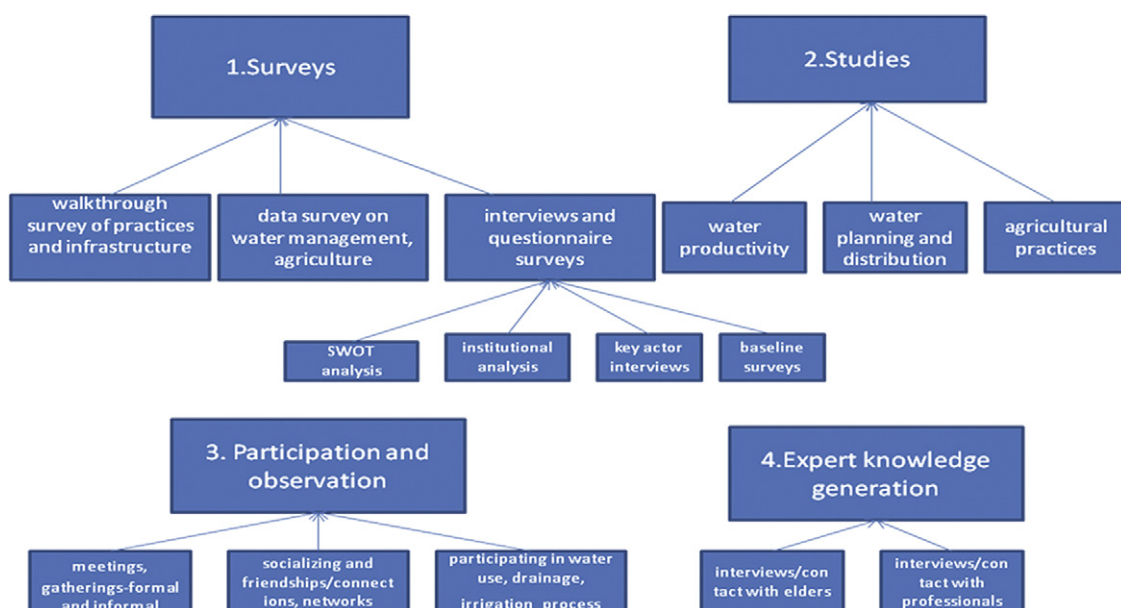


Fig. 4 – Research techniques applied for analysis of water management system.

on the existing state of the organization and changes which IWRM FV project brought into these organizations.

Key actor interviews: important and knowledgeable people of locality, e.g. former chairman of the collective farm, hydro-technician or retired/actual staff of WMO, elders of the village, more than 100 people in total were interviewed through unstructured/structured interview techniques. This was used to confirm/check information collected from structured interviews and surveys.

Baseline surveys: randomly selected number of water users (60–90) within each WUA were surveyed on the existing situation of agricultural production, water use and their contribution into the operation and maintenance of irrigation systems (Yakubov et al., 2004; Nizamedinkhodjayeva, 2007).

2.4. Studies

For complementing data and information collected from surveys, three types of studies were conducted in selected areas of water productivity, water planning and distribution and agricultural practices.

Crop water productivity studies: few fields located at the head, middle and tail of the irrigation canals were selected for measuring crop water productivity (CWP).

During the vegetation season, the following monitoring and measurements have conducted by the team of field research assistants: (i) vegetation growth data, (ii) water input (inflow, outflow, ground water, moisture change), (iii) soil salinity. Measurements have been conducted every 10 and 3 days prior to and 3 days after the irrigation events. The methodology of the water productivity studies well documented already for other parts of Central Asia (Murray Rust et al., 2003; Abdullaev and Molden, 2004).

Water planning and distribution: the water use plans of the study WUAs, WMOs were reviewed together with WUA staff and WMO professionals in order to understand how water plans are prepared, what are the major elements, data sets used and processes of water planning. During the peak irrigation season (June–July), one or two times the water inflows (discharges) into study WUAs and WMOs and water distribution quantities canals were measured. The data used to understand spatial differences on water distribution between different parts of the canals. The measurements conducted simultaneously in all the above-mentioned points of the irrigation system in order to capture actual situation (Abdullaev et al., 2006).

Irrigation practices: the irrigation practices of the farmers were monitored and documented during the irrigation events (furrow length, water depth in the field, duration of irrigation, etc.).

2.5. Participation and observation

Participation and observation technique was frequently applied to understand the socio-institutional aspects. Attending both formal and informal meetings, socializing through friendships and networking were essential methods appropriate for the study area. The participation in water distribution and drainage management activities as observer has made the position of the research much stronger. However, one should

realize the potential disruptions researchers brought due to the “effect of outsider”. Therefore, before getting engaged in this process, proper integration into local networks has been done. The participation and observation technique were looking into the following aspects: (i) organizations and rules, (ii) irrigation and drainage infrastructure and (iii) community and people.

3. Results and discussion

3.1. Project interventions – water management by hydrographic boundaries and water users’ inclusion into canal water management

3.1.1. Water management prior to project interventions

The collective farms had been bankrupted by the late 1980s due to the decline of state investment and subsidies to the agricultural sector (Spoor, 2004). The land reform process, which was initiated before independence from the USSR at the end of 1980s, gradually continued after independence (Abdullaev et al., 2007). The Government of Uzbekistan first transformed Soviet farms (*sovkhoses*) into collective ones and then transformed all collective farms into semi-cooperative *shirkat* farms at the end of 1990s. The reforms continued and the *shirkat* farms began to be transformed into the individual farming enterprises (Spoor, 2004). The final stage of the land reforms in Uzbekistan commenced in 2003 (Presidential decree, 2004). By 2006, all *shirkats* transformed into individual farms through a process arbitrated by land reform commissions. Although government has distributed land into the individual producers, it still practices crop production quotas for cotton and wheat (Abdullaev et al., 2007). Under the quota system, each head (*hakim* in Uzbek) of the administrative district is made personally responsible for fulfilling the state quota plans. Therefore, they mobilize all administrative power they have (police, money, etc.) to deliver on time, all the inputs needed to grow cotton and wheat, including water. At present, there are three main types of agriculture production in Uzbekistan. Individual farmers, primarily grow cotton and wheat for the state quota, Individual commercial farmers are producing rice, fruits and vegetables for trading, while family household producers are growing a variety of crops for subsistence (Veldwisch, 2008).

On-farm water management system which was part of the collective farming was left unattended after the de-collectivization process. The state water management organizations formerly delivering water to the collective farm gates were forced to deal with a multitude of individual farmers, growing different crops, and applying different agronomic and water management practices. Therefore, the need for a new organizational arrangement to manage water at the on-farm level and to distribute irrigation water between new individual farmers became an obvious necessity.

The entire system of irrigation water management, designed to deal with monocropping, cotton growing collective farms. The land reforms have resulted in a situation, whereby along the main canals, instead of a few, mainly cotton growing collective farms, there are now hundreds of individual farmers who are cultivating different irrigation

intensive crops such as rice, wheat and vegetables. This situation has increased problems with water distribution along the main canals, particularly when water scarcity frequently leads to clashes between water users. Often, due to inefficiencies into the irrigation system and water application methods, the amount of water withdrawals into the administrative districts much higher than their water shares – locally called as *limits*.

In 1999, Uzbek government have issued decree on organization of Water Users Associations (WUAs) in place of liquidated *shirkat* farms (Decree of Cabinet of Ministries, 1999). Thousands of WUAs have been registered within a few months. Therefore, WUA has not yet become real organization which could take water management responsibility at the former on-farm level.

3.1.2. Water management at SFC before the project interventions

Prior to the project intervention, South Ferghana canal was managed by the two separate administrative Water Management Organizations (WMO) of Andijan and Ferghana provinces of Uzbekistan. Each of the WMO has had separate water allocation plans, separate staff and budget for their portions of the same canal. Often, local *hakims* (head of local administration) in charge of agricultural production, requested WMO under their jurisdiction to withdraw more water to the irrigated lands of under their responsibility. Due to the administrative hierarchy, the WMOs were obliged to obey the local administration. This resulted in considerable deviations from the water use plans.

The competing request for water from both sides of South Ferghana canal made effective water management virtually impossible. The frequent conflicts over the water distribution between two provinces have resulted in mistrust between the two parts of the SFC. The water managers in Ferghana province (lower reach) suspected that Andijan (upper reach) withdrew more water than planned. In turn, the Andijan part of canal management accused Ferghana part of excessive water use due to the availability of water from internal Karkidon reservoir (Personal communication, 2001).

The WMO management of both sides of the canal considered their role to gain as much water as possible for their portion. The water was delivered sometimes without any need for it, with water flowing into the natural drainage system without being used for irrigation. At the same time the tail areas of the canal were suffering from lack of water for irrigation.

3.1.3. Implementation of project interventions: how to reflect local realities into donor driven project

Although in the beginning IWRM FV project was a typical of donor driven initiatives, when international donors are providing funds to implement specific ideas they value, using “blue print” solutions to the local problems (SDC, 2003, 2005, 2007) slowly it has been changed into the more realistic project. During the project preparation period SDC have given to the partners its vision on IWRM concept. Two partners in project implementation team had two different worldviews, IWMI being international organization was promoting the same values and ideas as SDC and SIC ICWC as part of regional

level organization was more aware of local realities but have been fiercely opposing the ideas such as participatory management, water users’ involvement, which is typical for state-funded organizations elsewhere (Saleth and Dinar, 2004). IWMI’s considerable international experiences on water sector reforms have been recognized by international agencies (including a donor). SIC ICWC being a part of transboundary water institutions have a great support by national and local water management agencies. Although these two organizations were filling each other’s weaknesses, in the beginning of the project they have had a fierce disagreement on the concept of IWRM, as a result two organizations have produced two different concepts. The IWMI concept was classical Irrigation Management Transfer (IMT), when the water management starting from tertiary canals up to main canals was given to the water users (IWMI, 2002). The SIC ICWC concept has been reflecting mostly technical improvements needed for better water management: improving the main infrastructure, automation of water distribution, etc. (SIC ICWC, 2002).

SDC have played an important arbiter role for developing joint IWMI and SIC ICWC concept on IWRM. Both IWMI and SIC ICWC were learning from each other through regular meetings, joint workshops and discussions. By the end of 2001, joint IWRM concept for pilot areas has been produced by IWMI and SIC ICWC teams (<http://iwrmi.icwc-aral.uz>). Joint IWRM concept of IWMI–SIC ICWC was different from the initial “blue print” one; it was reflecting the realities of post soviet Central Asia: still strong influence of the state in water sector, transboundary character of the water management. The core of the joint IWRM concept was more participatory irrigation management (PIM) not IMT concept, with central aim to create organizational structure reflected in Fig. 1.

The next issue was how IWRM concept will be communicated to the national water management agencies of Kyrgyzstan, Tajikistan and Uzbekistan who were partners of IWRM FV project. The national working groups (working groups) have been established by water agencies of each country for IWRM FV project implementation at the end of 2001. The working groups have been organized as a platform of communication between IWRM FV project team (IWMI and SIC) and national water agencies of each state. The IWRM concept has been given for comments to each working group. The working groups have taken up to three months to provide their comments on IWRM concept. After that the comments of national groups have been discussed in the workshop at Tashkent, IWRM concept has been updated accordingly. The three national water management agencies has signed under IWRM concept and allocated three main canals for pilot testing of the concept by 2002. In Kyrgyzstan Aravan-Akbura main canal, in Tajikistan Khodja Bakirgan main canal and in Uzbekistan South Ferghana main canals have been nominated as pilot canals by national water agencies (Table 2).

In pilot canal areas, the partnership and ownership of the IWRM concept was built through formation of local implementation teams (local teams). The local teams were consisting of staff from regional and district water management organizations, local government officials, Chairmen of WUAs located along the pilot canals. The discussions with local implementation teams (local teams) on IWRM concept took another few months and finished by the end of 2002. Starting

Table 2 – Information on pilot canals for testing IWRM concept (source: Manthirithilake et al., forthcoming)

Canal name	Country	Length (km)	Command area (ha)	Canal capacity (m ³ /s)	Number of districts
South Ferghana Canal (SFC)	Uzbekistan	142	96,215	92	10
Aravan-Akbura Canal (AAC)	Kyrgyzstan	80	9,240	28.8	2
Khodja Bakirgan Canal (KBC)	Tajikistan	40	8,275	32.6	2

from 2003 real implementation of IWRM concept has been started in the three pilot canals (see Fig. 5).

3.1.4. Water management in South Ferghana canal after project intervention

According to the IWRM concept, the governance and management functions of CMOs should be divided. The canal management organizations, organized within hydrological boundaries would be governed by WMOs on one side and by Unions of Water Users (UWUs) of the canal in other side (see Fig. 6). The UWUs have to be formed through federation of WUAs and water user (NGOs representing environment, industries, urban water supplies, etc.) along the pilot canals.

3.1.5. Hydrographic water management

The introduction of hydrographic CMOs went smoothly; the national working groups have been crucial players on convincing the water agencies of three countries to issue special decrees on merging formerly separate WMOs into one hydrographic unit in the pilot canals. The Ministry of Agriculture and Water Management of Uzbekistan issued a decree for a unified canal management organization (CMO) for

South Ferghana canal. The new unified organization – CMO took over the water management from the two former territorial units. All the capital equipments (tractors, cars and excavators, etc.) and staff were transferred to the new CMO. By the end of 2002, CMO management was responsible for the entire canal, preparing one water allocation plan and having control over the water distribution along whole canal.

The office of CMO was located in the middle of the canal, with direct reporting to the Central dispatch center of main canals of Ministry of Agriculture and Water Management of Uzbekistan. Now water releases to the irrigated areas along the canal were handled by one organization – the CMO. Although preparation and implementation of water use plans remained somehow similar to the previous practices, the distribution of water saw improved coordination due to the single decision-making body for the whole canal.

Although both former administrative WMOs were assigned the same functions, the organizational cultures were quite different. It took long before one could observe signs of united CMO in SFC. Still, in the beginning different hydrounits – branches of CMO at the different canal reaches were acting if they were still part of administrative unit rather than unified

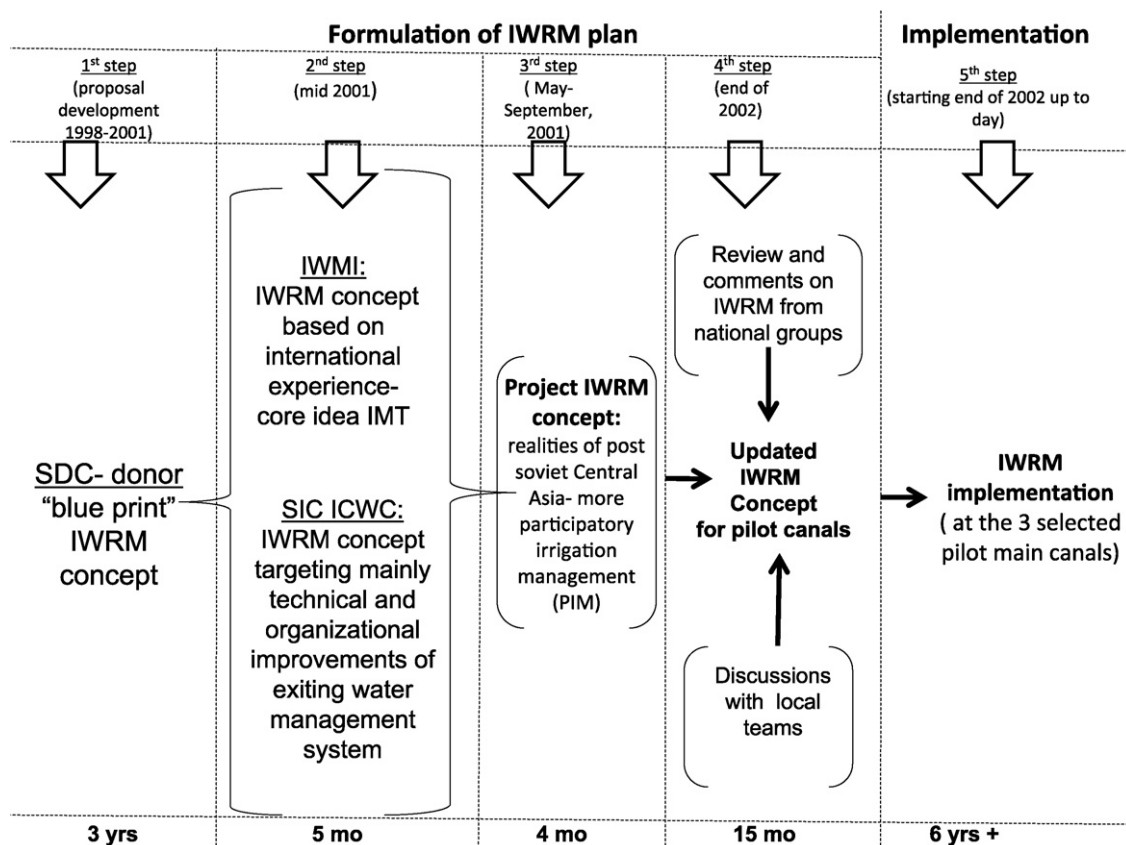


Fig. 5 – The steps of IWRM concept of the project.

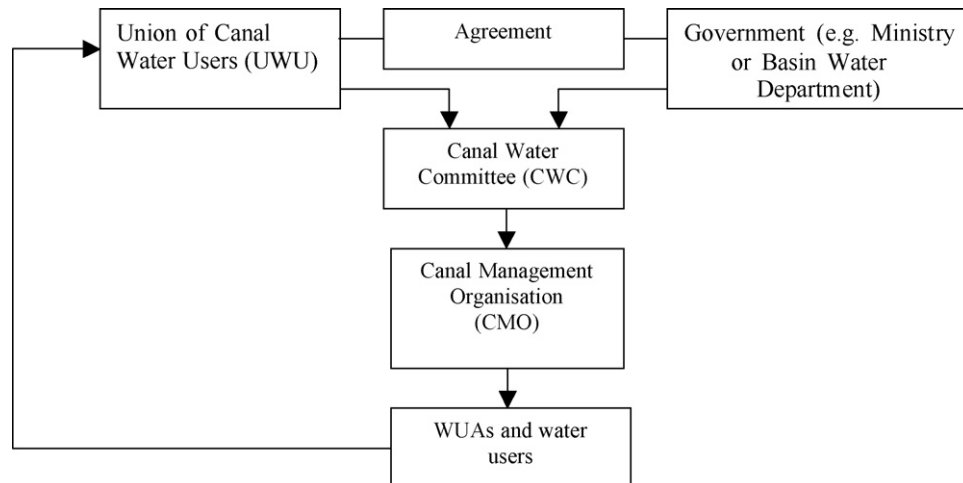


Fig. 6 – Canal governance through joint state-public body (source: Manthritilake et al., forthcoming).

CMO. They were taking orders from local *hakims* (governors) and releasing the water according to their request. The local teams were crucial on unification of the CMO as one organization. In each branch of the CMO they have conducted series of training for the staff on essentials of IWRM concept. Also, the whole staff of merged CMO has been gone through series of trainings on water management (water planning, water registration) and organizational culture (communication, team building). Informal parties or “gaps” (Uzbek traditional gathering of only man) has been organized by CMO manager for strengthening his team. Also, CMO manager have introduced rotation of heads of the CMO branches at the different reaches of the canal, appointing of people from Ferghana to Andijan part and vice versa. This strategy was implemented regularly, giving people chance to work in the different parts of the canal.

From the beginning of the project SIC ICWC, national and local teams have been constantly bringing up the technical interventions such as infrastructure rehabilitation, re-equipping of CMOs with transport means into the discussion table with SDC. Therefore, IWRM FV project team jointly with local teams and CMO staff also has assessed the state of the infrastructure, communication, transport needs of the CMO and the state of the water registration. The result of the assessment has been reflected on infrastructure improvement plan produced for pilot canals. The infrastructure improvement plans have included: automation of water distribution, improving water registration, communication and transportation for CMO. The plan was accepted by SDC for new project – Automation project.

3.1.6. Governance reforms and formation of Union of Water Users – UWUs

From the beginning national water management organizations were against for handing over any water management functions into water user’s representatives. Although the national agencies on water management have approved the IWRM concept of the project it took several rounds of talks and explanations to convince them on the separation of governance and management functions at the main canal level. The

request of national agencies was that the pilot canals will not be transferred to users’ hands as such, but users will join the governing processes of the canals with irrigation authorities. By the end of 2005, all three ministries approved that pilot canals could have “joint governance” boards to oversee the CMO, which still remains as a total government body. It was also agreed that these ‘joint governance’ boards shall have representatives from both government irrigation authorities as well as UWUs.

It took a year before the UWU has been organized along the pilot South Ferghana canal. Because, the proposed intervention required change in the mindsets of both water users and water managers. It was social in nature and almost revolutionary by the paternalistic standards of Central Asian water management. The project was proposing to include water users into the water governance system at the main canal level. Although, governments of Central Asian countries have been slowly reforming agriculture sector they have been very conservative in the water sector.

IWRM FV project staffs, jointly with CMO manager, Chairmans of WUAs and representative of state environmental agency, leaders of the two NGOs located within SFC command area have formed a working group for organization of UWU. As a first step, working group has drafted the statute of the UWU, using decree of the water agency on “joint governance” boards where UWU functions, roles were briefly described. According to the statute UWU must be “non-governmental and non-profit organizations (Statute of UWU of SFC, 2005). After the statute, working group at the local level have started to disseminate the concept through field visits, field days and workshops in the canal command areas. After the consultations with WUAs, CMO and other relevant partners working group decided in the first step to organize nine UWUs in South Ferghana canal, one in each branch of the CMO, called as *hydrounits* locally. The reason for organizing smaller UWUs was the large size of canal command area. WUAs taking water from each hydrounit have nominated one representative for the unit UWUs. The formation of the unit UWUs has taken almost a year and by the end of 2005 SFC has had nine UWUs along the canal. Early 2006 the unit UWUs have nominated one member to form a

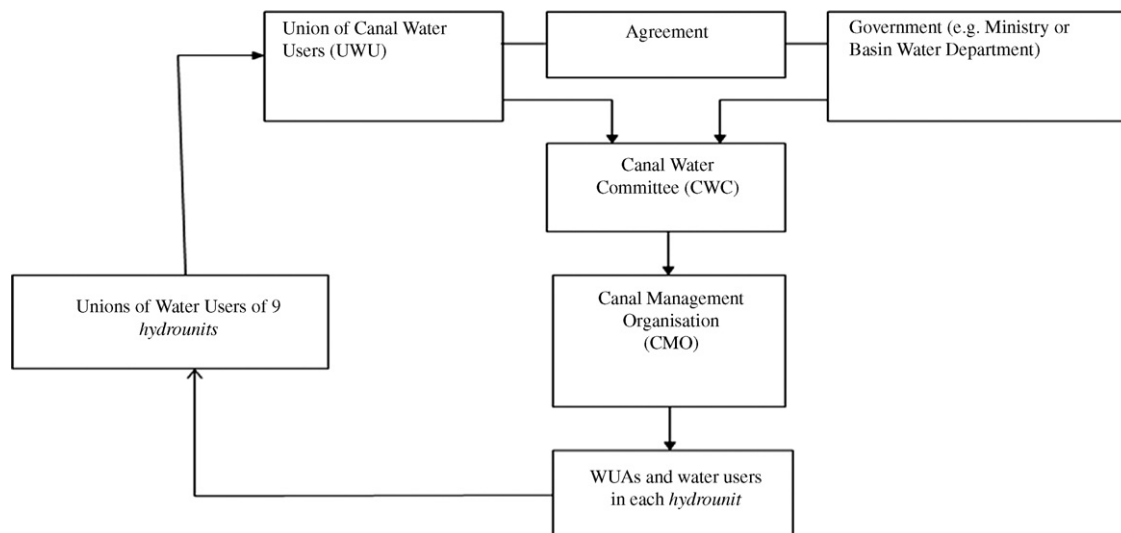


Fig. 7 – Canal governance through joint state-public body for South Ferghana canal.

UWU of the SFC. The governance body of the SFC, therefore, has been different from other two pilot canals (see Fig. 7). The nine members UWU in the first meeting have elected Chairman and deputy chairman. As a Chairman of UWU only women member was elected. During the whole 2006, IWRM FV project team has provided a series of the trainings for the elected members of UWU on water management and public participation in water sector.

Although UWU has been formed by early 2006, it took another one year before its formal registration through Uzbek authorities as an NGO. However, after the UWU has been formed it started to plan its activities along the canal command area. In the first two months, UWU members have conducted meetings with WUAs along the canal for introducing the UWU members and gaining support for UWU as water user organization at the canal level. It was an extraordinary step for Uzbekistan where NGOs on water sector has been rare. Also, immediately after the UWUs have been formed meetings of the governing board – Canal Water Committee (CWC) became regular. The CWC has been consisting of UWU members UWU members, staff from Basin Water Management Organization (BWMO) and CMO manager. The CWC meetings took place every 10 days.

During the CWC meetings UWU members began to present problems related to water provision for their respective locations. Conversely, during the meetings CMO manager started to present water use plans and its implementation (water distribution) along the canal. According to the results of the interviews with UWU members indicated that the major outcomes of the introduction of the governance body were the following (Field notes of September, October, December, 2006 and February, 2007):

(1) The information from CMO about the water situation and planning to UWU has made process of water planning and implementation quite transparent, the UWU has been instrumental on passing these information to the WUAs along the canal;

- (2) The complaints from water users on water related problems were handled more quickly than before;
- (3) UWU has been also able to help CMO to generate support-work force from water users on regular canal de-silting;
- (4) The number of water breaching – taking water with no permission has been considerably declined due to UWU's active stand on this issue. Earlier, WMOs of two parts of the SFC has not been able to stop or reduce illegal water intakes from the canal. UWU have started to register all intakes along the canal, owners of the illegal intakes were warned possible consequence of the illegal water withdraw from the canal and given a change to receive water from the irrigation system of the WUAs. Most of the people have agreed to change their intakes;
- (5) WUAs along the canal have been using the UWU as their advocate for the difficult issues they were facing at their level with local government representatives.

3.1.7. Linking water users and the canal water management: cost and problems of up scaling

The establishment of the UWU was an important water management innovation introduced in the region by the IWRM Ferghana project (SDC, 2005). There were costs of UWU establishment and operation, the costs of regular meetings, travel costs of the UWU members, salary of the secretary, office supplied, etc. In the beginning, in SFC the UWU costs have been covered from CMO budget. However, UWU members in consultation with WUA leaders have come into the decision to introduce a fee which will be collected from all primary water users (WUAs). The fee or charge UWU going to impose on WUAs is around 100 soum/ha or less than 10 US cents/ha. Although this is quite low fees even for Uzbek situation at present, WUAs cannot collect membership fees from their members (in Uzbekistan farmers are not charged for the irrigation water they only pay membership fees for WUAs). Therefore, there are doubts that WUAs can finance UWU operation.

Another major cost was the registration cost of UWU through Uzbek Judicial Ministry; it took very long time and

Table 3 – How many times you have irrigated your fields in 2003 (before the project interventions).

Number of irrigation	Head of the canal		Middle part of the canal		Tail part of the canal	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	6	12	7	14	10	20
3	5	10	9	18	8	16
4	7	14	6	12	3	6
5	7	14	5	10	6	12
6	8	16	7	14	8	16
7	5	10	6	12	5	10
9	4	8	2	4	2	4
10	4	8	4	8	4	8
12	2	4	2	4	2	4
13	1	2	1	2	1	2
Total	49	100	49	100	49	100
> 5 times		61		55		57
0–3 times		22		33		37

registration fees were quite high (around 300 USD). Therefore, without considerable contributions from its members, the registration cost could become a limiting factor for future UWUs. Overall the financing of UWU will become a central problem during the up-scaling of IWRM FV project experience elsewhere.

The other issue is implementation of water users' participation on the ground. The IWRM FV project have invested at least two years of time for mobilizing of the support of both high level decision makers and grass-roots water users. The experience of IWRM FV has convinced people who have been involved in the process about the positivity of the water users' inclusion into water management at the main canal level. However, establishing these principles in other canals will request huge social and political work.

3.2. Impact assessment for the project interventions through water users surveys

Assessment of the project's impact on water management situation has been conducted through structured questionnaire surveys of 147 cotton–wheat growing farmers located in equal numbers (49) at the head, middle and tail reaches of the

SFC (Yakubov and Matyakubov, 2003, Yakubov, 2007). The same farmers were interviewed before the project activities on started (2003) and after one year of project activities on institutional changes finished (2007). For the consistency of the surveys, the same farmers were interviewed in both the surveys. In both years, the interviews were conducted at the end of irrigation season the survey results presented below are in % from total number of interviewed farmers from each reach of the canal.

In 2003, the farmers who had not irrigated their lands were 12% for head, 14% for the middle and 20% for the tail part of the canal. Recommendation of Central Asian Irrigation Institute for cotton irrigation for the study zone is 4–5 irrigations per season (SANIIRI, 1982). The farmers who have irrigated their fields four times were 14%, 12% and 6% respectively for head, middle and tail end of the canal (Table 3). The farmers who have irrigated five or more times in 2003 were equal to 61% in the head, 55% in the middle and 57% in the tail part of the SFC. Differences between percentages of farmers who irrigated 0–3 times are quite sensible and it was 22% for head, 33% for middle and 37% for tail of SFC. This indicated that the head located farmers in 2003 growing season have had more secure water provision than farmers at the middle and the tails of the canal.

Table 4 – How many times you have irrigated your fields in 2007 (after the project interventions).

Number of irrigation	Head of the canal		Middle part of the canal		Tail part of the canal	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	4	8	6	12	9	18
3	2	4	6	12	7	14
4	11	22	9	18	7	14
5	9	18	5	10	6	12
6	8	16	8	16	5	10
7	6	12	6	12	6	12
9	2	4	2	4	2	4
10	4	8	4	8	4	8
12	2	4	2	4	2	4
13	1	2	1	2	1	2
Total	49	100	49	100	49	100
> 5 times		65		57		53
0–3 times		35		24		33

The survey in 2007 indicated that there has not been considerable change in water distribution in SFC.

In 2007, farmers who had not irrigated their cotton were 8% for head (4% reduction from 2003), 12% for middle reach farmers (2% reduction) and 18% for the tail of the canal (2% reduction). The farmers who had irrigated four times as normatives suggest were 22% for head, 18% for middle 14% for the tail of SFC (Table 4). This indicated some improvement in all reaches of the canal, the % of farmers irrigated four times their crop has been increased by 8% for the head of the canal, 6% for the middle and 8% for the tail end of the SFC.

The number of the farmers over irrigates (>5 times) at the head of the canal have increased in 2007 up to 65% or by 4% in comparison with 2003. It increased up to 57% or by 2% at the middle and reduced to 53% or by 4% at the tail of the canal. The farmers who have not received sufficient irrigation have increased up to 35% or by 12% at the head, reduced to 24.5% or by 8% at the middle and reduced to 33% or by 4% at the tail end of the canal.

The farmer survey results show although the water situation at the tail end of the canal has been improved in comparison with pre-intervention period (2003), number of farmers who under irrigated reduced there has been no dramatic changes on water distribution along the SFC.

3.3. Conclusions and policy implications

Since mid-1990s Central Asian countries has been new battle ground on establishing of IWRM principles in water management (Kazakhstan National Integrated Water Resources Management & Water Efficiency Plan, 2005, project proposal on IWRM for Kyrgyzstan, website visited 6th August, 20089, project document of National IWRM Planning and Transboundary Dialogin Central Asia (Preparatory Phase, website visited on 6th August, 2008, <http://europeandcis.undp.org/environment/kyrgyzstan/show/3D2183BB-F203-1EE9-B07C4DD4E9B1B56D>).

Although almost each IWRM plan declares that the holistic approach, stakeholder participation, water users' representations are crucial elements of IWRM implementation, there has been no or little success on implementation of those declared principles. One of such rare examples of IWRM implementation is Integrated Water Resources Management in Ferghana Valley project. The project has promoted water users' inclusion into the water management at the main canal level.

Although IWRM FV project was one of those donor driven initiatives its experience on establishing Water Users Unions at the main canal level as platform of water users' participation for water management gives insights into the process of IWRM implementation in Central Asia. The battle between partners and participants of the project on developing acceptable IWRM concept which reflects both international experience and realities of the region is one of the good lessons for the existing and new projects on IWRM. The other good lesson is organization of national and local working groups for internalizing of IWRM implementation process also one of important lessons of the project.

The formation of the UWU has improved the transparency of water management, helped to improve responsiveness of water managers to the water users complaints, generated support on canal de-silting, helped to reduce illegal water

withdrawals from the canal and WUAs have seen UWU as their advocate organization. Establishment of UWUs provided a higher platform for the representation of water users than common WUAs at the on-farm, secondary canal level.

The results of the water users' surveys before and after UWU has been formed have not shown a considerable improvement on water distribution.

This case study provides a concrete and detailed example of implementation of IWRM elements at the main canal level in Ferghana Valley where hundreds of main canals like the SFC exist in Uzbekistan and elsewhere in Central Asia. The replication of the experience of this study in those canals in Uzbekistan, and in Central Asia as a whole, will bring long-expected sustainability to irrigation water management. The inclusion of water users will also engender more transparent practices and as a result reduce the transaction costs of water management. The implementation of the above approach on a basin scale will require a huge effort to mobilize water users and re-organize the irrigation water management structure. Water allocation approaches should also be revised with more inclusion of water users' voice in the process. This requires goodwill from state agencies, which has to be emphasized and managed as a key element in the process.

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