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Swiss Agency for Development and Cooperation (SDC)

Interstate Commission for Water Coordination (ICWC)

FINAL REPORT
Of
**INTEGRATED WATER RESOURCES MANAGEMENT IN FERGANA
VALLEY Project**
Phase III
(1 May 2005 - 31 April 2008)

Implemented by:



Scientific Information Center of the
ICWC (SIC)



International Water Management
Institute (IWMI)

Tashkent, 2008

Abbreviations

| | |
|---------------------------|--|
| AAC | Aravan - Akbura Canal |
| BP | Business Plan |
| BISA | Basin Irrigation System Authority |
| BWMO | Basin Water Management Organisation |
| CHF | Swiss Francs |
| CMO | Canal Management Organization |
| CWC | Canal Water Committee |
| DWD | District Water Department |
| FOMP | Farmer Ownership Model Project, Tajikistan |
| FV | Ferghana Valley |
| ICWC | Interstate Commission for Water Coordination |
| IFAS | International Fund for saving the Aral Sea |
| ISA | Irrigation System Authority |
| Isfairam-Shakhimardan ISA | Isfairam-Shakhimardan Irrigation System Authority |
| ISMO | Irrigation System Management Organization |
| IWMI | International Water Management Institute |
| IWRM | Integrated Water Resource Management |
| IWRM-Ferghana | The Integrated Water Resources Management in Ferghana Valley project |
| KBC | Khodja - Bakirgan Canal |
| LF | Log frame |
| MAWR | Ministries of Agriculture and Water Resources |
| MIS | Management Information System |
| NCSGs | National Coordination and Support Groups |
| O&M | Operation and Maintenance |
| PC | Pilot canal |
| PSC | Project Steering Committee |
| RAS | Rural Advisory Service, Osh, Kyrgyzstan |
| RBC | Right Bank Canal, Kyrgyzstan |
| SDC | Swiss Agency for Development and Cooperation |
| SECO | Swiss State Secretariat for Economic Affairs |
| SFC | South - Fergana Canal |
| SIC | Scientific Information Centre |
| TSR | Transboundary small river |
| UCWU | Union of Canal Water Users |
| UWU | Union of Water Users |
| WUA | Water User Association |
| WUASP | Water User Support Project (USAID) |
| WUG | Water User Group |
| YPO | Yearly Plan of Operations |

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I. Summary

The Swiss Agency for Development and Cooperation (SDC) has been supporting financially the Integrated Water Resources Management Project in the Ferghana Valley since 2001. The main objective of the project is to improve the effectiveness of water resources management in the Ferghana Valley by promoting institutional reforms in Kyrgyzstan, Tajikistan and Uzbekistan that share the valley in accordance with the Integrated Water Resources Management principles. The project implemented by the partnership association of IWMI and SIC, is finalizing its third phase where the IWRM principles tested throughout the previous phases have been further consolidated, improved and generalized. In particular, it involved capacity building, training and dissemination activities on a wider scale than in the previous two successful phases through established effective partnerships with policy makers, other projects, educational institutions and extension services.

During its inception phase the project analyzed the existing water management issues in Central Asia, selected and justified the project sites, made initial contacts with key stakeholders and adapted the IWRM principles for further adoption to the local context. The key findings of the inception study was that the state support to maintain the lower level irrigation systems was declining in Central Asia; the increasing number of farmers due to land reforms led to immense institutional gaps in water management below district level; and inefficient water management practices were causing lower than potential water productivities. The plan for institutional reforms in line with the IWRM principles was the key output of the project.

The implementation phase, that followed, tested and adopted major approaches, frameworks and methodologies for introduction of IWRM along three pilot main canals in the Ferghana Valley. The project initiated major institutional reforms through establishment of unified canal management organization along hydrographic boundaries, harnessing canal governance setup with water user involvement, creation of pilot WUAs using bottom-up social mobilization approach. In addition to such organizational changes, the project also empirically identified that significant potential for higher water productivities existed on plot level. To realize the latter, it is required better management of on farm irrigation water with due consideration of crop water requirements, soil and climatic conditions. Some agro technical measures were tested and proposed to enhance on farm water use efficiency such as land leveling.

The reported phase III through further consolidation and generalization of the adopted IWRM principles aimed at strengthening both vertical and horizontal linkages. For instance, vertically water distribution and public participation were tried to be integrated at all levels of the water management hierarchy – from tertiary (informal user groups) to secondary (formal user associations) to main canal levels (public-government partnerships) with proper linkages at national policy level. Horizontally, e.g. inter-sectoral integration, emphasis was made on massive consultative social mobilization efforts. For better policy uptake and to ensure support at national level the project established multidisciplinary and inter-ministerial groups. Besides, a component dealing with trans-boundary small rivers was added to the project's agenda to start introducing the IWRM principles in managing water of such rivers shared by communities located in different countries following the same project framework.

Thus at the canal level, achievements of the project included:

- Establishment of the vertical linkages between different hierarchy levels - canal, WUA, water user groups and farmers; horizontal linkages were additionally promoted, e.g. incorporation of inter-sectoral interests (industries, water supply, energy, environment, municipalities etc.) under single canal management organization;
- Separation of governance and management functions;
- Establishment of three Unions of Canal Water Users (UCWUs) - one per each pilot canal;
- Integration of all types of water and uses in the water allocation planning through MIS tool at each pilot canal;
- Technical tools for water allocations, business planning and performance assessment were provided.
- Established link with educational Institutions to develop future water professionals with IWRM understanding

- Organized a technical tour to Turkey to learn experiences on PIM
- Project has prepared several guidelines useful for the day-to-day operations of canal level stakeholders.

Under the component on WUA development (Result 2), project has achieved considerable gains by plugging the institutional vacuum between WUA and thousands of small time water users by creating 'Water User Groups'- WUGs. Leaders of these smaller groups, originating and representing actual local users manage to give life to hitherto dead WUA councils. This initiative has solved many recurring problems including actual user participation, quality of water distribution, system maintenance, conflict reduction, ISF collection, etc. Further, improved MIS introduced to pilot WUAs proved to be useful and practical in real-time decision making. Project has developed many innovative approaches including business planning for these WUAs and prepared user-friendly guidelines for the stakeholders. Two user-friendly water use planning methods were introduced by the project and practiced by WUAs. The pilot WUA experiences are disseminated along the pilot canals to other WUAs as well as to other donor-funded projects in the region.

Project has further worked on the identified problems related to land and water productivity. It has revised the hydromodule zones (except for Tajik area, as no soil information was available) according to the existing conditions and recommended for testing and adoption of new irrigation norms for these zones. Project staff continued monitoring of few farms from the Phase II, for verifying changes in sustainability of achieved improvements of productivity, which proved to be positive. As agreed for the phase III, project has looked for potential partners for dissemination of the gained knowledge. In all three countries, there were partners for this purpose, some projects, some NGOs and some are government establishments. Project has signed partnership agreements and trained the partners' extension workers to disseminate results. A document indicating legal obstacles to productivity improvements and rights and obligations of the officials and farmers were elaborated. Some of the instruction documents and guidelines developed by the project too have been shared with them. This partnership is continuing to date.

NSCG was another innovation of the project, developed to disseminate ground level results and experiences to National levels. It also served useful to push through project activities at ministry level. This effective tool has helped moving the agreements on joint canal management through the ministries. NSCG served as a conduit for project documents for national application. It has helped adjusting several legal directives with the project results and experiences.

Work in TSR areas started not along with other project activities, as it was added on later. Despite the late start, a considerable amount of work was done on review of local and international agreements on water sharing and practices in the area, on the technical aspects and social mobilization aspects. Based on these reviews of treaties/agreements/ govt. orders, a new agreement was drafted, with the aim of establishing river coordination commissions, to coordinate the sharing of river waters. On the technical aspects, data concerning runoff, irrigation diversions, information and maps on water use, irrigation systems, etc were collated and analysed, in order to understand the conflicting issues across the borders. On SMID, it was decided to look at the existing WMOs and reorganize them along the IWRM principles. This was a tremendous task due to sensitivities of the border regions.

II. Introduction

To consolidate and improve regional cooperation in the water sector SDC has been successfully promoting a set of reforms in different components of the water sector (rural water supply, automation, regional hydrometeorology, flood prevention, capacity building and institutional development, information exchange etc.). Improving efficiency of water management through introduction of IWRM principles is one of the core activities that have been endorsed by SDC in Central Asia.

Land reforms in Central Asia following the dissolution of Soviet Union has led to the emergence of numerous medium to smallholder farmers, thus, putting the government-run and administrative (district and provincial) water departments under immense financial and institutional stress. The situation has resulted in multiple conflicts among water users, inadequate allocation of water, environmental problems and social imbalances. To address such in Kyrgyzstan, Uzbekistan and Tajikistan, the Integrated Water Resources Management in the Ferghana Valley project was initiated by IWMI and SIC and financially supported by SDC with the purpose to contribute to more secure livelihoods, increased environmental sustainability, and greater social harmony, through improved effectiveness of water resources management using IWRM principles.

The project started in 1999 when IWMI and SIC submitted the concept note to SDC on improving water management efficiency in Central Asia, after which three planning workshops were organized to develop and discuss the project concept and framework.

The first phase of project activities included research on existing water management issues in the region, selection of intervention sites and designing an IWRM-based intervention to meet local political, economic and water contexts.

Phase Two resulted in the development of the IWRM conceptual framework, which was approved by the ministries of water management in the three project countries. In addition, a comprehensive social mobilization approach was developed to establish bottom- up water organizations; unified canal management organizations were set up along hydrographic boundaries; a canal governance setup where water users played a major role in decision-making was devised; ways to increase water productivity by 30% were demonstrated through better on farm irrigation water management.

The specific objectives of the third phase were as follows:

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

Hence the specific outputs of the third phase were:

1. Pilot Canal Management Organizations are practicing IWRM principles;
2. Developed WUAs are allocating and delivering water in an equitable and reliable manner based on IWRM guidelines;
3. Improved farming technologies are adopted and disseminated below WUA level;
4. National level policy improvements and changes are facilitated;
5. Sustainable water resources management in trans-boundary small rivers.

The project's external review took place in September 2007. The key findings of the review mission are summarized below.

Major achievements of Phase III:

- The project has achieved substantial progress in not always favourable conditions and has managed to put the principles of Integrated Water Resources Management 'on the map' in the Ferghana valley. The project is also well anchored within the three governments and their respective ministries.

- The project has developed a unique approach to IWRM (reorganising entire canals with both governance and management structures) for which no model was readily available. Due to this pioneering role, social mobilisation (raising awareness, explaining new concepts, convincing) has been important.
- IWRM-Fergana is rather complex - with two implementing organisations and three 'country components' - but also unique in that it has a strong regional or interstate collaborative focus. Progress in the three countries is uneven, with Kyrgyzstan in the lead, followed by Uzbekistan, and Tajikistan somewhat behind schedule. A range of reasons can be attributed to this, from government policies and strategies to the different size of the pilot canals as well as to structural aspects.
- Another unique specific of the project is that it covers and joins together different levels of water hierarchy by common principles, common responsibilities, but also by common approach to water - from bottom to top by demands and from top to bottom by system of planning, control and account. Representation representative for low level to upper has reflected this approach in the institutional (governance) integration of hierarchy levels, some as technical tools (MIS, planning).

III. Important Achievements of IWRM Ferghana Phase III

Result 1: Pilot Canal Management Organizations are practicing IWRM principles

Three unified Canal Management Organizations (CMOs) were established in these three pilot canals (PCs) with powers of jurisdiction within hydrographic boundaries - over the command areas. Three Unions of Canal Water Users (UCWU) were formed and were legally registered as non-governmental, non-profit organizations. These two types of organizations are new entities to water users and it is suggested that this is the first attempt to establish such institutional structures in these post-Soviet countries. A framework acceptable to all parties was developed in a participatory manner for the participation of users at the canal level. Accordingly, the governance and operations functions are to be separated in pilot canals. The user participation would be restricted to matters associated with the governance of canals, with the complex canal operations left with the technically qualified CMOs. The involvement of users in the decision making process at the canal level would be gradually increased based on their financial contribution to the management of the canal. This means until the users are financially strong, the government shall share the cost burden of canal management. In accordance with this accepted concept, agreements were developed with responsibilities of each of the main parties - Ministry, regional basin water management organization, CMO, UCWU, and to transfer the governance functions of the canals to CWCs - joint (state and public) governance bodies. Several discussion meetings and workshops were organized with officials of water ministries, regional basin organization representatives, WUA and UCWU representatives to this effect. In these discussions, it was agreed to establish a core group of people - what could be termed a *"critical mass"* to move the process forward, i.e. implement the above framework. The framework was first rolled out in the Kyrgyzstan part of the project. It is note worthy report that there were great difficulties and much effort and time had to be spent to push through the framework in Tajikistan and Uzbekistan.

By establishing this framework the project achieved the vertical integration between different levels of water management hierarchy: namely, the Ministry, Basin, Canal, WUA, WUG, Farmer; and horizontally, the inter-sectoral integration: namely, domestic, urban, industry, environmental and agricultural water supply, all of which had interests at the canal level. Business planning, MIS and other tools that were introduced, as part of this process should serve to strengthen these new water management institutions and make them more sustainable.

A number of much needed gauging devices were installed in identified locations, in order to strengthen the quality of water distribution, monitoring and water accounting along the canals. Manuals and guidelines were developed for the staff of these new institutions and training materials were produced. Further, improved and applied MIS tools have enabled these fledgling organizations to maintain accurate records of water distribution; the calculation of water requirements; assisted in the analysis and assessment of the on-going water distribution situation in real time using and constantly updating databases. The initiative also introduced a new version of MIS supported by methodological guide and intensive training. Alternative water allocation methods were proposed but preference was for the age old, used systems. Pumping stations along PCs were inspected, situations were analyzed and recommendations were given to improve their efficiencies.

In order to achieve a long-term sustainability of supply of experienced personnel, special links with local and water relevant universities were established and IWRM principles were introduced into their curriculums. The aforementioned achievements were gained through well-organized awareness and capacity building activities, meticulously designed and locally appropriate social mobilization campaigns among key stakeholders.

Described below activities were implemented with the aim of achieving the Result I expected in the Logical Framework:

1.1 Integrate Governance, management functions and inter-sectoral interests under one Canal Management Organization at three pilot canals (SFC, KBC and AAC)

Initially, there was an intense resistance to transferring canal management to user organizations. Skepticism was expressed on the ability of users to manage such long and complex canals with large numbers of dependent farmers and associated production outputs. The project partners in close dialogue with stakeholders worked to define and discuss alternative organizational structures for the management of these main canals with user involvement. Because of these above mentioned reservations, it was decided to develop a step-wise process of transition towards users, based on the ability (financial contribution, etc) and allow them to gain experiences in the management of canals. This issue was discussed in stakeholder meetings in depth, and consensus was achieved. The final agreement reached was that, with the approval of the government (Water Ministry will issue an order and sign an agreement to this effect), users and regional basin water management organizations should establish a “joint body”, which would be called “Canal Water Committee - CWC”. The CWC will carry out only the governance function related to the canal. Day to day operations shall be left to the CMO, which is a professional body that is part of the government. The CWC will consist of representatives from UCWU as well as the regional basin management organizations. Head of CMO will serve as non-voting ex-officio in the CWC, and provide Secretarial assistance and assist in preparing other required information and points of clarification. UCWU representatives for their part will assist the CMO by organizing users, disseminating to them required information about breakdowns, repairs, water stoppages, etc. Membership at CWC is divided according to the contribution each party make to the operations of the CMO. CWC is required to approve the water distribution plan, financial and repair maintenance plans and assist with information flow between users and canal management. CWC is required to meet either monthly or fortnight as needed and review the operational situation. CWC also should try to convince farmers to cooperate and contribute (ISF, labor, etc) when needed. Regional basin management organization will secure the government interests in the canal, and facilitate government financial and other support to improve the canal management.

Three Unions of Canal Water Users (UCWUs) have been established - one per each pilot canal. The UCWU as an organization of water users is taking the initiative and an active part in canal management and is raising water users' voices to a higher level. In Kyrgyzstan this was initially, a WUA led organization, because there were number of WUAs already functioning in the AAC command area. In Tajikistan, at the time of application for registration, KhBC had only one WUA and rest of the area was functioning largely as government/ cooperative farms. Hence, the legal registration of the aforementioned cooperatives were achieved by making the large cooperative farms founding members, assuming that eventually new WUAs shall join as they are established. In Uzbekistan, the legal procedure to register UCWU as an NGO has been dragged on for a considerable period and had to overcome many legal hurdles. However, informally, all three UCWUs were functioning along with CMO to improve water management from the beginning of 2006. UCWUs of Pilot Canals were registered on following dates:

- ❖ UCWU AAC (legal registration 26.01.2005)
- ❖ UCWU KhBC (legal registration 21.11.06)
- ❖ UCWU SFC (legal registration 27.02.2007)

Currently the UCWUs of Tajikistan and Uzbekistan do not represent the newly established limited number of WUAs. Tajikistan is still struggling what to do with the large agricultural commercial cooperative farms. Uzbekistan's canal length, bureaucracy and slowness in decision-making continue to be an impediment to the appropriate functioning of these institutions. UCWUs of Kyrgyzstan and Tajikistan still have sections to represent separate raions (each canal per two raion), while the Long South Fergana Canal of Uzbekistan is represented by representatives from nine (9) raions or segments of canal. One important achievement is that SFC UCWU elected chairperson is a woman, who is also the Chair of the WUA, she is representing at the UCWU. Currently the UCWU SFC is implementing the plan of WUA development along the entire length of their canals. Efforts are continuing to involve other stakeholders (at least water users from Pilot Canals). In 2007, UCWU AAC received applications for membership from: 3 mahallas (residential neighborhoods) and 3 industrial water users. Leaders of the

newly established WUGs are increasingly becoming WUA Council members with the latter becoming members of the UCWU AAC (e.g. WUA Isan and WUA Joypas, Kyrgyzstan); Four (4) Pumping Stations along KBC were handed over to the CMO. Further, the state has handed over the entire length of SFC to the CMO.

Thus, the integration process achieved by the project included:

- Establishment of the vertical linkages between different hierarchy levels - canal, WUA, water user groups and farmers;
- horizontal linkages were promoted, e.g. through the incorporation of inter-sectoral interests (industries, water supply, energy, environment, municipalities etc.) under a single canal management organization.

1.2. Create broader understanding of the new institutional structure for the transition period with wide involvement of all stakeholders

In Central Asia, public participation in irrigation management has been limited to secondary, tertiary or on-farm irrigation systems level. The project has successfully negotiated a transfer of this responsibility held solely by the state, to govern an irrigation scheme and the main canal, to a unique “joint management” arrangement between the state and the water users, bringing water users’ influence a step closer to meaningful participation. This again was an important water management intervention introduced in the region by the project. Although the status and mandate of these ‘state-public’ governing bodies are still under discussion, it puts the principle of user participation one step higher in the water resources management hierarchy than it was previously, bringing it to the scheme (main canal) level. The Figure 1.1 shows how public participation is now built into water management up to the canal level. Water users’ representatives (on left) and the technical expertise (on right) integrated in the governance and management at each level.

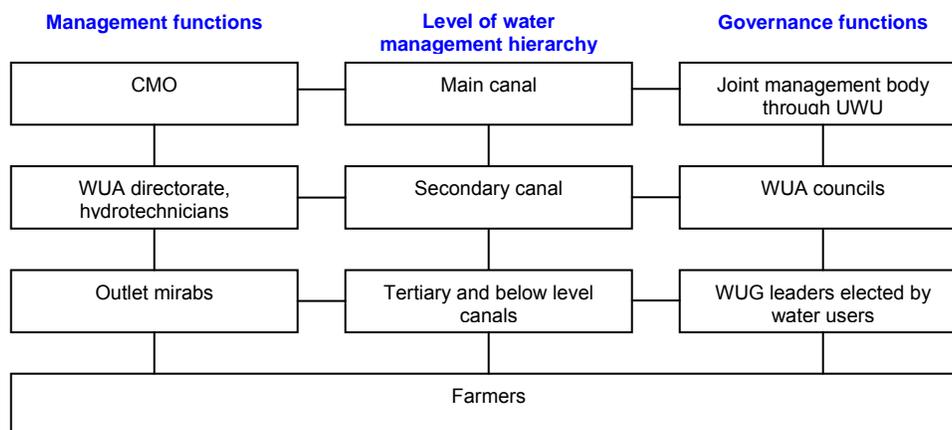


Figure 1.1. Public participation at different levels

a) Consensus building and SMID activities amongst the key stakeholders of South Fergana Canal (SFC), Aravan Akbura Canal (AAC) and Khodj - Bakirgan Canal (KBC)

SMID activities - intense awareness building and social mobilization to develop consensus among the stakeholders were carried out among water users. Prepared stakeholder inventories were instrumental in understanding the socio-hydraulic settings, involvement of water users and consultations, to improve the conceptual design of governance for adequate user representation. The SMID activities conducted involving the above-mentioned new organizations were focused on the sustainability of those institutions through their own internal developments and strengthening cooperation amongst them, both horizontally and vertically. It is apparent that sustainability of these organizations will be possible

only if, there is active participation of their key stakeholders and a consensus among them, with regard to the following issues:

- water users' participation and inclusion of multiple interests of all types of water users into decisions;
- clear cut roles and responsibilities of WUAs, UCWUs, CMOs and CWC in their domains;
- identified paths of development of their new water management organizations

To contribute to consensus-building amongst stakeholders, the project organized a number of workshops and SMID group meetings at each of the three pilot canals - AAC, SFC and KBC - with the involvement of all key stakeholders (see Table 1.1). The aims of the workshops were two-fold:

- to strengthen vertical linkages amongst the organizations of water hierarchy through improved understanding amongst all the stakeholders and equipping them with useful tools and information for consensus building and cooperation;
- to build capacity of the stakeholders' representative teams to work together through a practical trial stages (on-the-job training)

In particular, the process of consensus building comprised three stages: 1) discussions; 2) suggestions; and 3) modifications, including **consented** recommendations. For example, if any participant representing any group of stakeholders was against a recommendation of the same or another group, then he/she had to prove, why it was not in the interest of all the stakeholders, rather than his/her personal interest and/or his/her own ambitions.

Continuous SMID was targeted at:

- building understanding of the irrigation sub-sector stakeholders on the need, benefits and process of consensus building amongst them on a regular basis;
- practical application of the designed three-stage consensus building process; and finally,
- consensus of all the participants about their specific recommendations for enhancing vertical linkages amongst the new water structures for that period of time

In general, the consented recommendations for Uzbekistan and Tajikistan were building sustainability of new water organizations through capacity building of the staff; reduced or no interference of the local authorities and district WMOs in the water distribution process; transfer of the responsibilities of PWMO to CMO; as well as strengthening the role of UCWU in protection of water users' interests. In Kyrgyzstan, the focus of recommendations were to strengthen the UCWU, expand its membership to non-agricultural (city) water users and increase its role/voice at higher levels of WM hierarchy. The topics discussed, number of participants and meetings organized by SMID teams are presented in Table 1.1.

In each country, SMID focused on the followings:

In Uzbekistan:

- CMO shall carry out an inventory of SFC water users;
- Construct water measurement devices in order to know how much water is used by different water users and thus ensure equitable water distribution;
- Activate UCWU through social mobilization, involvement of more water users, capacity building programs and strengthening of the assets base through developing enabling legislation, business planning and close cooperation with academic institutions;
- Involving UCWU in developing proper water plans, delivering water accordingly and improve fee collection at WUAs;
- Transfer of water allocation responsibilities from BISMO to CMO, which shall be legally supported;
- Strengthen linkages amongst all stakeholders, including WUGs, WUAs, CMO, UCWU, BISMO, Ministry and etc.) through regular consensus building meetings;

In Kyrgyzstan:

- Strengthen the resources management through business planning at all levels of water hierarchy;

- Build trust of water users through proper water distribution by WUAs with the assistance of UCWU in social mobilization;
- BWD, UCWU and CMO shall organize meetings with water users to resolve conflicts between head-and-tail water users;
- Construct water regulatory structures by CMO, UCWU, JM and WUAs;
- Encourage new institutions to involve young students in becoming water professionals through education grants and invite students for obligatory 'after graduation internships' to gain experience in the irrigation sector for 3 years;

Table 1.1 SMID activities along the pilot canals

| | SMID TOPICS | PILOT CANALS | | | | | |
|----|---|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| | | AAC | | KBC | | SFC | |
| | | No of meetings | No of participants | No of meetings | No of participants | No of meetings | No of participants |
| 1. | IWRM principles: new organizational changes | 9 | 245 | 8 | 229 | 12 | 281 |
| 2. | Role of public participation in improving water management | 11 | 155 | 13 | 106 | 21 | 387 |
| 3. | Functions of CMOs and hydrographic principles | 8 | 96 | 6 | 72 | 14 | 156 |
| 4. | Union of water users - user run organization | 3 | 43 | 4 | 37 | 8 | 93 |
| 5. | Difference between governance and management - why to differentiate | 2 | 14 | 3 | 23 | 9 | 72 |
| 6. | Transfer of governance responsibility to the joint management body - why to establish canal water committee | 5 | 56 | 7 | 38 | 10 | 166 |
| 7. | Reorganization of administrative WUAs into hydrographic and their membership in UCWU | - | - | 6 | 54 | 17 | 189 |
| 8. | Inter-sectoral integration - participation of non agricultural water users in the governance | 24 | 83 | 5 | 25 | 4 | 73 |
| 9. | Establishing branches of UCWU in canal hydro-sections and their composition | - | - | - | - | 20 | 364 |
| | Total | 62 | 692 | 52 | 584 | 115 | 1781 |

In Tajikistan:

- Creating awareness on the responsibilities and the roles of new water organizations (well defined with no duplication of such responsibilities among the organizations);
- On issues related to water charges, payments, etc;
- Building consensus to relieve pressure coming from Khukumats on Water organizations (at least UCWU);
- The CMO and WUAs shall distribute water on time and in compliance with the accepted water plans with the UCWU monitoring the equity of water allocation;
- Appropriate methods for CMO to collect water charges;
- Improve cooperation amongst WUGs, WUAs, UCWU, CMO and PWMO and local authorities, considering the needs of both small and large water users;
- How state officials can support the process of transfer to participatory management.

The project team initiated SMID activities along two small rivers - Shakhimardansay and Khodjabakirgansay, which have linkages to Aravan-Akbura, Khodja-Bakirgan and South-Ferghana canals.

b) Transfer Management to CMOs/CWCs during the project period

It was mentioned earlier the concept of gradual management transfer that was developed and accepted by all stakeholders of the project. However, though CMOs were made operational in 2003, progress has been slow. There were many reasons for the delay; most of them were beyond the control of the project. Reasons were, related to existing legal barriers and bureaucratic procedures. Events took place in the following chronological sequence:

| | EVENT | SFC (UZBEKISTAN) | AAC (KYRGYZSTAN) | KBC (TAJIKISTAN) |
|---|---|---------------------|---------------------|---------------------|
| 1 | Establishment of single unified and hydrographic CMO | 28.07.03 | 24.07.03 | 13.11.03 |
| 2 | Legal recognition of Union of Canal Water Users by the State Justice Department | 27.02.07 | 26.11.05 | 21.11.06 |
| 3 | Signing of the public and users joint management agreement | 28.06.07 | 10.02.06 | 07.05.07 |

The project has developed a conceptual basis ‘Joint Governance’ framework through consultations with key stakeholders (ministry, provincial WMOs, district WMOs, CMO, UCWU, WUAs and other sectors). The project has facilitated the establishment of the ‘Joint Governance Body’ (a state-public partnership named as the Canal Water Committee - CWC) through signing the agreement between the state (relevant Ministry) and the water users (Union of Canal Water Users). CWC comprises the representatives of both the state and the water users (through UCWU) and the number of members from each side is proportional to their share in the CWC budget. As Part of the CWC establishment process, the project has created a “critical mass” - a working group, comprising the key stakeholders. This ‘critical mass’ had moved the transition process forward in individual countries. With this, the process became locally owned and not project driven.

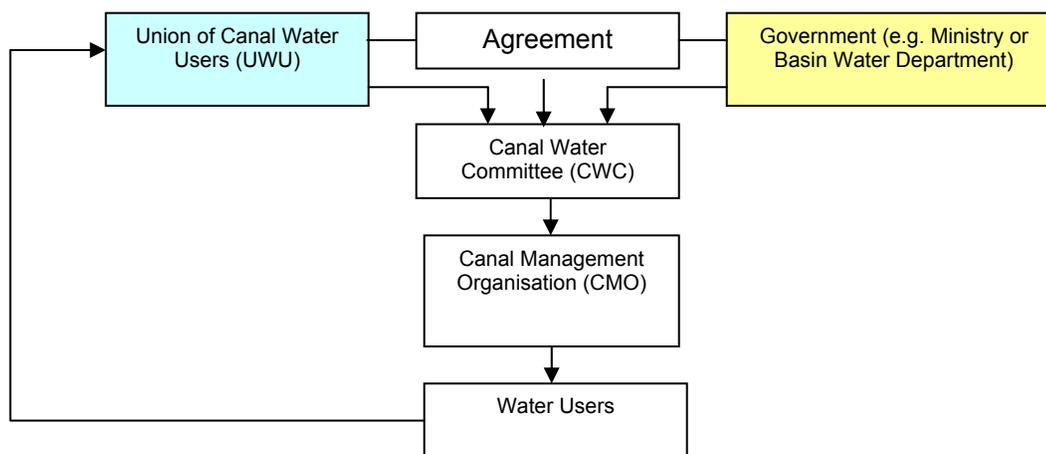


Figure 1.2. Governance over canals through “Joint state-public” body

1.3 Develop recommendations on improvement of the legislation at national level for dissemination and replication

There are substantial differences in the legal settings of the target countries due to the differing socio-economic conditions and on-going agricultural reforms that prevail in each of the target countries. Obviously, these differences have hindered the project progress due to their diversity. Bearing in mind multiple factors that influence the outcomes of the project in different countries, overall, project activities in Kyrgyzstan are steadily moving forward, while those in Uzbekistan and Tajikistan are lagging behind and requiring more reform efforts by the governments, especially in Tajikistan and Uzbekistan. Particularly, the following issues discussed below, require attention:

Uzbekistan:

- The country still does not have a law governing WUAs and therefore legal registration of these entities is fraught with problems. However, in 2005-6, the government has converted all 'Shikat' farms to administrative WUAs.
- WUAs are treated as non-profit commercial organizations, hence, are subjected to taxation, etc.
- Uzbekistan does not charge Irrigation Service Fees (ISF). Hence, encouraging the more efficient use water is not practical. The Ministry is pilot testing various schemes of charging ISF in different regions for the last three years with little success.
- O & M is still heavily dependent on the government finance as there is no ISF collection practice.
- Uzbekistan runs a tight control over the private land use. There are main crops, which must be grown by the farmers under state supervision.
- This 'State Contract Farming System' for main crops would be appropriate, if the input and output markets were free, thereby reflecting the real prices and costs associated with production and commodity process. Currently, the price of cotton is fixed and the state is sole buyer. Current buying price levels encourage neither productivity increases nor resource conservation.
- Cash return to farmers produce is channelled through cumbersome banking procedures, and most of the time access to cash is difficult.
- State officials are very much trying to influence and manage WUAs and their water distribution, because of the absence of WUA law.
- Many farmers are reluctant to challenge these interferences avoiding possible drastic consequences and harassments
- Legal awareness among farmers is very weak or they are not interested, as they are used to be guided by officials.

project has regularly brought up its recommendations on legal reforms to the notice of the Parliament and senior government policy makers. In addition, through the NSCG discussions have been undertaken on these matters. However, as is common in Uzbekistan legal and policy reform is a slow process. What is required is a 'cohesive policy and legal framework', which encourages farmers to use land and water in a productive manner to improve the livelihoods of farmers.

Kyrgyzstan:

The greatest degree of reform in the region has been achieved in this country. The country has required water legislations, government support for WUAs, basin organizations, IMT experiences, etc, etc. However, implementation is scant and legal awareness of water users is limited. Hence, officials continue to play a considerable role in the affairs of water management. In Kyrgyzstan, land fragmentation is a significant issue that creates problems. Hence, the government is encouraging the establishment of farmers' cooperatives. Flexibility and opportunities for IWRM promotion is high, compared to other two countries.

Tajikistan:

In September 2006, the Tajik parliament approved the WUA law. It is of note that the project team contributed to the discussion, through the Ministry of water resources before, it was approved by the parliament.

In Tajikistan, the establishment of WUAs along KBC is still a legal challenge given the uncertainty of land reforms with existing quasi-state farmer cooperatives and joint stock farm societies. This absence of user representation, provide an opportunity for the regional water department and the CMO to behave as previously or elsewhere, and put undue pressure on the farmers, in order to collect ISFs. Tajik farmers have to pay not only for the irrigation services, but also for the water. Also, for the debt of former Kolhoz farms, to which his land was belongs to, with interests. Tajik water users claim that they have no funds to pay for water, which is high compared to other countries in the region. The inability of water users to pay the KBC for water delivered is creating chaotic situations. In order to improve the ISF recovery the CMO of KBC has implemented what could be termed coercive measures such as suspending water delivery to water users for non-payment.

Tajik farmers are also influenced by a 'contract farming system', but in contrast to their counter parts in Uzbekistan, with private moneylenders. Tajik farmers have to purchase inputs (most often poor quality) in the open market, whereas in Uzbekistan, government provides all inputs and the costs are deducted from their earnings. In the redistribution of land associated with new government policies farmers also inherited the debt of former kolkhoz farms. Furthermore, unpaid (taxes + debts) are added with interest to the next year's charge. Farmers are constantly seeking relief from this unfair debt burden. The project has taken this issue up with the Ministry as well as NSCG; however, no remedial measures are foreseen in the near future.

Legal Situation

Thus, substantial differences exist between the target countries due to differing agricultural reforms, legal frameworks and policy settings and obviously in resulting socio-economic conditions. Bearing in mind multiple factors that influence the outcomes of the project in different countries, overall, project activities in Kyrgyzstan are steadily moving forward, while those in Uzbekistan and Tajikistan are lagging behind and as such requiring more intensive efforts especially, in Tajikistan.

The comparison of National Water Laws (NWLs) of the countries participating in the project and Laws' exemplary structures has revealed that in general, the negative inheritance of the past still remains. And all attempts to make principally new provisions resulted, mainly in separation and/or combination of sections, chapters, articles, clauses and items of the old Water Laws. This increasingly refers to the Law "On water and water utilization" of the Republic of Uzbekistan and to a lesser extent - the Water Code of the Republic of Tajikistan. At present, only the Water Code of the Kyrgyz Republic includes almost all regulatory provisions, directly answering practically all IWRM principles. To a considerable degree, it might be explained by the recent date of the Code's taking effect (2005). It seems to take several years to make many regulatory provisions of the Code to work. In particular, it concerns the creation of appropriate organizations, Basin Councils, implementation of water charges as a natural resource etc.

The following different aspects of Water Laws of the countries participating in the project, are referring to IWRM in varying degrees: ownership of water; turn-based water utilization; water users' rights and duties; water consumption charge; water use priorities; legislative foundations of hydrographization; legislative foundation of public participation; legislative foundation for WUAs and Union of Canal Water Users (UCWU) establishment, etc.

The question of ownership of water resources, water bodies and water facilities on transboundary areas is very urgent and directly connected with issues of water resources management at different levels, in particular at canals level on transboundary areas. Interested parties through negotiations should resolve the problem of ownership of transboundary water resources (or part of them).

One of the main aspects of water resources management is rotation-based water use in terms of irrigation water supply. In this context, it is interesting to quote part of the "Moslem Water Right (MWR) Provision" in the Water Code of the Republic of Kazakhstan. It says: "...If any of land owners can not use a river in another way but dam it and co-owners come to agreement among them, so irrigation turn should be started from the river downstream to upstream; when it is up to the upstream, only then it is allowed to dam the river".

It seems to be reasonable to include the MWR Provision mentioned above, in to the drafts of Laws on Associations (Unions) of Water Users and to the draft of the Water Code in Tajikistan and Uzbekistan. The significance of the entering this fundamental Moslem Water Right Provision in Water Legislation of each country of Central Asia and its practical application in water resources management of the region could hardly be overestimated. Perhaps, this is the only way, which would allow improving essentially the current situation concerning water supply of the Amudarya and the Syrdarya lower reaches, other rivers, streams, especially during water scarcity years.

The comparative analysis shows that there is some confusion between rights and duties, which has remained as an inheritance from "Principles of Water Legislation of the Union of SSR and Allied Republics..." in NWLs of Central Asian countries. Separation of rights and duties is very important in a legal sense.

The principal distinction between duty and right lies in the fact that one can exercise one's right or refuse it. Sanction (penalty) is not considered for exercising a valid right in the order established by law. Quasi multiplying of rights should be denied.

The disadvantages of NWLs of the countries participating in the project concerning protection of water users' rights are inherited from "Principles of Water Legislation of the USSR and Allied Republics" parts referring to interpretation of one and another duties of water users. It seems that in the sense of present understanding of the necessity of civil society building and equality of rights, in particular of parties to water relations, only the rights of these parties could be interpreted laterally but not duties.

As non-compliance of one or another requirement of Law results in penalty, their list should be comprehensive and specified in the Water Code. Otherwise, these "other grounds" (termination or limitation of rights for water consumption) could be interpreted freely at a lower level at drawing up regulatory and legal acts of ministries, state committees, and agencies, decisions of public authority on-sites. Also, these "other grounds" could result in different kinds of abuse of office and do not facilitate the strengthening of lawfulness in the sphere of water relations. The mentioned above is also fairly for grounds of responsibility for National Water Laws breaking.

There are no principal problems in general, in terms of transfer to the basin principle of water resources management in the countries participating in the project. The Water Code of Kyrgyzstan, the Water Code of Tajikistan, the Law "On Water and Water Consumption" of Uzbekistan make the provision for public participation in water resources management. However, in NWLs of the countries participating in the project, public participation in water resources management is reflected poorly and assigned a secondary significance to a certain extent.

The analysis results of certain aspects of water legislation in the countries of Central Asia are given above. At present, water experts of the region understand the necessity for water legislation improvement and harmonization in the countries of Central Asia. However, because of a range of circumstances, centrifugal tendencies dominate in this matter, which are the obstacle for creation of appropriate international regulatory and legal basis for shared transboundary water resources management in the region.

Only in Uzbekistan, the Law on WUAs has not been passed. Such a Law would essentially, strengthen the WUAs position.

In principal, there are no problems for creating UCWU, however having an Article on UCWU in the Laws on WUAs, would accelerate essentially the process of UCWU creation and legal registration.

1.4 Assist CMOs/ CWCs in preparing Business-Plans

In 2005, project carried out a review of the business planning (BP) experience in Central Asia and elsewhere. The study revealed that introduction of the BP concept for institutions such as CMO and UCWU, is a unique case and somewhat innovative in Central Asia. In 2006, IWMI together with SIC

extensively studied the actual business of CMO and UCWU and collected data from AAC CMO and AAC UCWU in order to test the basic concepts in a real life situation and develop a sample BP that could be the basis or a general guideline for further use. In the same year, the first versions of BP samples for CMO and UCWU were drafted for AAC CMO and for the AAC UCWU by the project staff.

These samples were discussed for adaptation through a round of training-workshops in each of three training centers in Fergana Valley. These workshops, attended by a number of people including specialists from canal management organizations and district water departments as well as members of the Union of Canal Water Users - mainly UCWU Council members (governing and executive body, CWC members, CMO staff and other stakeholders of all three pilot canals), discussed the guidelines and suitability for their own use. As for the other pilot canals, the project staff only monitored the preparation of CMOs' and UCWUs' Business Plans, with the local SMID teams playing a vital role.

The Guideline authors consider that these BPs can be further enhanced and developed during Phase IV, where concepts of Asset Management, economic benefits of service tariffs, volume based water fees collection, financial threshold analysis and other important aspects could be considered.

1.5a. Assess feasibility of alternative water allocation procedures and system management

A comprehensive report on international experience in water allocation has been prepared and shared with project partners for their comments and contributions. The report consists of four parts: (i) analysis of water allocation practices during the Soviet times: strength and weaknesses; (ii) highlights of socio-economic changes, affecting water allocation; (iii) review of world experiences in water allocation and (iv) suggestions with regards to water allocation principles, applicable in the project areas. The three water allocation mechanisms widely used in the world are: (i) administrative, (ii) user-managed and (iii) market-based. The major strengths of the Soviet time water distribution included the following features, central to the then irrigation water management: (i) coordinated water allocation at basin level; (ii) existence of long term water development planning for major river basins; (iii) clear and prioritized water allocation for different sectors of economy; (iv) crop based (demand) water allocation, adjusted to water availability. The major advantage of the water allocation during the Soviet time was reliability of water supplies and the pertinent decisions made for each former Soviet republic, province and irrigation system concerned. Once agreed and made, the inter-sectoral, inter-territorial water allocation - decisions were strictly followed in the implementation with few deviations. Weaknesses of the Soviet time water allocation framework included: (i) inter-sectoral and inter-territorial discrimination, (ii) absence of effective incentive systems, leading to wastage of water resources, (iii) low or no response to the local realities. The major deficiency of the existing water allocation model is that it does not reflect the changes in agriculture, which took place during the last few years, such as the formation of numerous smaller water users in place of large collective farms.

Cases from the Lower Colorado River Basin (USA) and New South Wales (Australia) were compared with the Kyrgyz water allocation system to draw appreciable lessons. Focus group discussions were held involving key local stakeholders to discuss the options available. Preliminary findings of the comparative analysis suggest considerable gains from policy and regulatory refinements of current water allocation practices could be made in Kyrgyzstan and neighbouring Central Asian countries. Such policy and regulatory improvements could be instrumental in increasing the viability of the new water institutions and allowing effective transition towards integrated water resources management. The comparative inquiry suggests the following procedures and instruments that can be tested for effectiveness in the pilot areas to improve current water allocation:

- Determining user rights based on the 100% guaranteed natural river runoff (riparian right);
- Creating incentives for water users and WUAs to adopt water saving technologies by initiating marketing tools that encourage water savings;
- Applying different water delivery tariffs to naturally flowing and regulated (saved & stored in reservoir) water to create the market of saved water within the river basins;
- Eliminating restrictions for double cropping even in low-water years and reallocating irrigation water resources according to economic feasibility and crop growth phase;
- Establishing preferential access to water for those who invest in water saving technologies;

- Promoting crop-specific water tariffs and fee adjustments considering irrigation method applied;
- Testing water allocation planning based on available water resources, which is significantly different from the water permit (limit) system when water users are given maximum water entitlements. Under the proposed approach, water users will receive guaranteed amount of water (limited) in the beginning of a cropping season with a consequential increase in water supplies throughout the cropping season.

1.5b. Operationalize accepted procedure in form of tested system of planning, updating, monitoring and assessment by applying simplified models, account of other existing water sources (ground, return, and waste) in water use plan

The project has provided, new gauging facilities including gauging rods, flow meters for head gauging stations and gauging propellers to meter flow velocity (See Table1.2). With renovation of head gauging stations of the pilot canals, required updating and correcting of flow monitoring tables, was completed on time. Further, technical conditions of other gauging stations were also surveyed that resulted in further SFC gauging stations being rectified. Flow characteristics of all balancing, controlling gauging stations of pilot canals and their outlets (selectively) were statistically processed, in order to determine their correlations and errors. Frequent observations were made at AAC and KhBC controlling gauging stations.

Reliability of flow charts for PC controlling gauging stations was verified by sampling measurement of water flows. Trainings were organized for canal hydrometers on calibration methods at gauging stations, preparation of flow characteristics $Q = f(H)$ and keeping technical documentation for gauging stations. Guidelines on water accounting for hydrometers of main canals was also prepared.

Table 1.2. Allocation of gauging equipment

| No | NAME | SFMC | AAC | KHBC |
|----|----------------------------|------|-----|------|
| 1 | Gauging rods: | | | |
| | - 0,5 m | 150 | 46 | 14 |
| | - 1,0 m | 40 | 8 | 50 |
| | - 1,5 m | - | 2 | 4 |
| | - 2,0 m | - | 6 | 4 |
| | Total: | 190 | 62 | 72 |
| 2 | Gauging propellers IST-01* | 4 | 2 | 2 |
| 3 | Flow meters UEM | 1 | 1 | 1 |

The new version of the Management Information System (MIS) was installed in all three pilot canals and staff was trained on the same for operational use. This «MIS -Ferghana» version is consist of complex system of mathematical models and data flows. It was created based on Data base manager ACCESS and GAMS. Presently, «MIS-Fergana» version 3.0 is installed, tested, and fully functional at pilot canals.

«MIS-Fergana» allows:

- Accounting actual water withdrawal from each outlets and canals;
- Registering applications for decade water supply;
- Modeling different options of water distribution between water users under various applications and various water supply volumes;
- Finding optimal options of water distribution;
- Analyzing water distribution effectiveness

System of water distribution indicators includes (beside traditional indicators practiced by canal operators in water distribution: water availability, efficiency, unit water supply) the following:

- sustainability of flow at controlling gauging stations during a day;

- Sustainability of average daily water supply during decade;
- Water supply equitability;
- fees for water services;
- Others

Concerning MIS the following documents were prepared and disseminated:

- Guideline on using MIS tools for users to prepare, adjust water distribution plans and calculate water distribution indicators at pilot canals level;
- Guideline on water distribution monitoring and evaluation;
- Guideline on pilot canal operation

The followings were organized:

- Systematic input of monitoring results in database (DB);
- Calculation of decade (total) indicators for water distribution;
- Submission of water distribution indicators to UCWU and CWC for operational (and final) evaluation of water management quality at pilot canals to make decisions for the next decade (season)

At the same time, “MIS-Fergana” program needs a range of improvements and eliminating a range of defects taking into account the necessity of the tool development for every day use and operative planning. In this connection, during Phase IV, the interface intended for average user, extremely convenient and understandable for users with appropriate prompts and reminders for prevention of bugs and necessity of programs resetting will be developed. In addition, reference books will be checked thoroughly and accurate coordination of operative planning considering water content of major water sources and distortion of actual climatic data from average long standing ones and sowing of second crops as well.

Water distribution program testing is additionally provided for under extreme conditions (drought, flood).

1.5c. Recommendations to improve operations of the pumping stations (PS)

1. Pumping stations operational issues were analyzed along the South Fergana canal area;
2. Proposals for improving pumping station operation and water accounting reliability were prepared.
3. Pumping station operation was regulated on the basis of:
 - Optimal schedules for PS operation;
 - Specification of command areas;
 - Stabilization of energy supply;
 - SFC UCWU control

Resulting in sharp reduction of water supply (M3/ha) from PS.

1.6 Replication of the IWRM experience to one additional canal

An introductory seminar on “IWRM experience along AAC and its implications to the Right Bank Canal” was held jointly with Osh BWD as the start of dissemination of the project results. The representatives of the Karasu District WMO, system managers of RBC sub-canals - Uvam, Yakkalik and Yuzhny, attended the seminar. This seminar had the following three main objectives:

- Present the IWRM experiences and results achieved at AAC;
- Introduce the local SMID team to the representatives of the RBC system before their full involvement in field activities;
- Hold an experience sharing exercise - presentation of advantages and achievements in the AAC and RBC systems;
- Appraise the issues along RBC and develop a dissemination strategy (work plan) to address the problems;

In particular project’s help was sought in activating local WUAs, organizing on-site trainings; establishing WUGs, mobilizing water users to maintain their canals, mobilizing local support with involvement of local governments (ayil-okmotus), aksakals (elderly activists) and water users, improving

water management. All these were meant to be conducive to increased ISF collection and solving issues with the canals that flow through multiple neighbourhoods (mahallas) of the city of Osh. With these in mind, in 2007 the project started its SMID activities aimed to introduce IWRM along the entire the RBC. The latter consists of three main secondary canals - Uvam, Yakkalik and Yuzhny.

The activities in this new area were designed to use and build upon the experiences and with the involvement of stakeholders from AAC. The SMID activities were organized around the following key issues:

- Hydrographic boundaries (Inventory of canal stakeholders, hydrographic analysis of the irrigation system, etc);
- Establishment of WUGs (involve in WUAs; participation of WUGs in WUA councils; formalizing WUGs);
- Support for informal networking of WUAs;
- Facilitation of WUAs to conduct technical improvement through user involvement (WUG initiatives);
- On-the-job training for WUA hydrotechnicians and WUG leaders based on 5 modules (crop needs, water accounting, water planning, distribution, performance);
- Application of social and technical performance indicators;
- Simple and user friendly irrigation basics and concepts;
- Introduction of “Transparency Boards” in WUAs (mostly in dense areas or user-frequented places);
- Formalization of WUGs and agreements between WUA and WUGs (transfer of authority by users to WUG leaders)

Seventeen (17) different WUAs were involved in this preparatory work (See Table 1.3).

Table 1.3. Information on WUAs along the Right Bank Canal for IWRM-related SMID activities

| # | WATER USER ASSOCIATIONS | RURAL AUTHORITY - AYIL OKMOTU | DIRECTOR OF WUA | NUMBER OF WATER USERS | IRRIGATED AREA UNDER WUA SERVICE, HA |
|----|-------------------------|-------------------------------|-----------------|-----------------------|--------------------------------------|
| 1 | Monok | Kashkar-Kyshtak | Parpibaev K. | 248 | 524 |
| 2 | Jalaliddinov | Kashkar-Kyshtak | Jaloliddinov I. | 309 | 1734 |
| 3 | Jar-Ooz | Kashkar-Kyshtak | Ibragimov M. | 127 | 485 |
| 4 | Chomo | At-Tash | Duysheev T. | 230 | 1593 |
| 5 | Rahmat | Mady | Bahalbaev J. | 1316 | 3261 |
| 6 | Saray-Suu | Joosh | Ermатов K. | 48 | 280 |
| 7 | Sultan-Naz | Joosh | Sultanov N. | 1267 | 1997 |
| 8 | Konurat-Yurt | Joosh | Shadiev A. | 105 | 901 |
| 9 | Qizil-Koschu | Joosh | Kalbaev N. | 48 | 520 |
| 10 | Maz-Aykal | Otuz-Adyr | Aydarov O. | 1131 | 1690 |
| 11 | Shark Uvam | Shark | Maksimov U. | 79 | 2312 |
| 12 | Mongu-Suu | Saray | Nurmatov A. | 503 | 2100 |
| 13 | Jani-Turmush | Jani-Arik | Karimov R. | 167 | 2298 |
| 14 | Irrigator | Nariman | Talipov M. | 414 | 1972 |
| 15 | Abror | Nariman | Mamajanov B. | 289 | 1059 |
| 16 | Qara-Dobo | Nariman | Akynbekov S. | 44 | 300 |
| 17 | Haliljan-Ata | Nariman | Kadyrov H. | 86 | 171 |
| | Total | | | 6411 | 23197 |

Following canals were selected for replication together with National Coordination and Support Group (NCSG):

- In Uzbekistan - Shakhrikhansay section (this part of the SFC was included in the implementation of further SFC hydrographization);
- In Tajikistan, it was decided to continue operations along Khojabakirgan Canal, including its machine irrigated parts.

Work on the replication was undertaken using the following approach:

- Involving representatives of water users and officials of authorities in-charge of selected canals to participate in workshop-trainings devoted to the following issues:
 - hydrographization;
 - involvement of water users in the process of water allocation management;
 - monitoring and estimating water allocation together with water users
- Initial technical information on Shakhrikhansay and Right Bank Main Canal (RBMC) zones was prepared to enter it into database (DB).

1.7. Assess project impact through performance indicators, water users' satisfaction surveys and secondary data

1.7a. Annual analysis of canal performance indicators regarding equity, reliability, adequacy, and timeliness using CMOs/CWCs data, GIS/RS

Because of project implementation, the following results were achieved at pilot canals:

1. Water distribution related conflicts were sharply reduced or practically stopped between CMO and water users;
2. Fee collection at KhBC MO and AAC MO for water services increased;
3. Situation related to water supply to tail-end water users was mitigated. Now local downstream authorities «have no headache» and water users do not spend nights along canals (when it is their turn to take water) and do not fix tens of padlocks on regulating gates in order to avoid «unauthorized water withdrawals» (theft);
4. Water management quality has improved (Table 1.4):
 - Decision making process was simplified and become more efficient;
 - Water supply equity and sustainability has improved; (See also Diagrams from 1.1 to 1.3)
 - Unit water supply has reduced; (See also Diagram 1.3)
 - Organizational losses were reduced along canals

Table 1.4. Water distribution indicators for Pilot canals

| PILOT CANALS | YEARS | ACTUAL WATER SUPPLY * | EQUITY | SUSTAINABILITY | EFFICIENCY | UNIT WATER SUPPLY |
|--------------|-------|------------------------|--------|----------------|------------|-----------------------------|
| | | million m ³ | % | % | % | thousand m ³ /ha |
| SFMC | 2003 | 1053 | 60 | 85 | 81 | 12,6 |
| | 2004 | 925 | 89 | 87 | 88 | 11,0 |
| | 2005 | 871 | 94 | 85 | 87 | 10,3 |
| | 2006 | 816 | 94 | 84 | 89 | 9,2 |
| | 2007 | 643 | 92 | 84 | 86 | 7,2 |
| AABC | 2003 | 83 | 45 | 70 | 54 | 13,1 |
| | 2004 | 66 | 63 | 91 | 53 | 9,8 |
| | 2005 | 57 | 69 | 84 | 54 | 8,5 |
| | 2006 | 54 | 74 | 81 | 59 | 8,0 |
| | 2007 | 64 | 82 | 90 | 59 | 8,3 |
| KhBC | 2003 | 116 | 36 | 41 | 80 | 14,4 |
| | 2004 | 113 | 82 | 58 | 78 | 15,8 |
| | 2005 | 115 | 73 | 64 | 78 | 16,5 |
| | 2006 | 90 | 80 | 54 | 80 | 12,1 |
| | 2007 | 88 | 77 | 62 | 81 | 11,8 |

* water withdrawal from pilot canals to the boundaries of users' areas (WUA, agricultural cooperatives, etc.)

From the Table 1.4, it is clear that organizational reforms implemented by IWRM Fergana project has reduced the water intake to pilot canals by 25-30% while improving their delivery characteristics. This is an important achievement of the project, which would have significant implications for countries.

1.7b Organizational performance assessment

It was decided; in future CWCs and UCWUs would do their own self-assessments in order to improve the organizational performance. An organizational performance assessment tool was developed for this purpose. The document describing this tool comprised of three sections: 1) concept of the approach, 2) method, and 3) a step-by-step guide. Analytical framework for CWC and UCWU performance assessment is based on IDRC methodology for organizational performance assessment as well as UCWU statutes, Agreements, minutes and other project documentation. The self-assessment framework covers the following dimensions of performance: quality of water supply in terms of adequacy, timeliness, reliability and stability of water deliveries; b) maintenance of canal infrastructure; c) participation (contributions) of primary water users'; d) conflict resolution: frequency, nature and settlement of disputes.

1.8 Create institutionalized capacity within research and educational systems for training CMOs/ CWCs staff (training of trainers, study tours and exchange visits using research and training systems)

The project has established the following collaborations with the educational institutions in the project countries of the Fergana Valley:

In Tajikistan, with:

- Dushanbe State Agrarian University, and
- Khojand Branch of Tajik Technical Institute (Tajikistan),

In Uzbekistan, with:

- Marhamat Hydro-Amelioration College, and
- Tashkent Irrigation and Melioration Institute (Uzbekistan),

In Kyrgyzstan, with:

- Osh Agricultural Institute, and
- Bishkek State Agrarian University (Kyrgyzstan)

Each of the above collaborations had the following agenda:

- The project organized a seminar and a study tour to project sites for the students and faculty members of all the above-mentioned colleges and institutes;
- project signed an MOU on cooperation with each school;
- Working groups were established to adapt project materials using local academic standards and introduce a new study course on IWRM principles into local curricula;
- The new IWRM course amounting to 50 academic hours (20 for theory and 30 for practical courses) established in the local curricula will be targeting senior level students;
- The project supported study-work internship program for 35 best performing students in the pilot canals' areas jointly with provincial WMOs.

MOUs were signed with following institute to effect the above: Dushanbe SAU, Khojandt Branch of Tajik TI (Tajikistan), Markhamat HAC (Uzbekistan), Osh AI and Bishkek SAU (Kyrgyzstan); Letters of notification on introducing the IWRM course (Tajik Tech Institute, Markhamat College, Osh Ag Institute).

In 2007 MOUs were signed with Bishkek Agrarian University (Kyrgyzstan), Dushanbe State Agricultural Institute (Tajikistan).

The project received a letter from the Rector of Osh Agrarian Institute regarding 3 former students who having successfully graduated from the Institute following diploma internship and defense were employed by the AAC CMO and Osh BWD.

Kyrgyz SMID team organized seminar lectures each Saturday in Osh to share project experiences with the faculty and students of 3rd and 4th year courses at Osh Agrarian Institute.

In 2006, the project arranged a technical visit to Turkish Irrigation Authority for the key officials of Ministries, UCWUs, CMOs and few WUAs with the kind support from Prof. Dr. Veysel Eroglu, DSI Director General, Turkey. Twelve members of the project participated in this technical tour for 14 days in May 2006. They visited various water management institutions, irrigation systems and authorities that manage those systems to understand and learn from Turkish experiences of PIM.

Following materials were prepared for the use of stakeholders under Result 1 (See also Table 6.5 in Annexes):

- Conceptual framework of transferring management functions to joint governance
- The 10-Step IMT Methodology-cum-Action Plan for Pilot Aravan-Akbura Canal in Osh Province, Kyrgyzstan
- The Stepwise Methodology and Action Plan of Transfer of Management to Joint Governance of the State and the Water Users of Khodj-Bakirgan Canal in Sogd Province, Tajikistan
- Ministry approved agreement on Joint Governance;
- Model Charter of the UCWU;
- Model of Business Planning Guidelines for canal organizations;
- MIS guidelines and software;
- Self-Assessment Methodology for User Based Canal Organizations (draft);
- Recommendations on legislative improvements;
- Recommendations on resolving disputes and conflicts;
- Guideline on water accounting for hydrometers of main canals
- Guideline on using MIS tools for users to prepare, adjust water distribution plans and calculate water distribution indicators at pilot canals level;
- Guideline on water distribution monitoring and evaluation;
- Guideline on pilot canal operation

Result 2: Created WUAs are distributing and delivering water in equitable and reliable manner using IWRM guidelines

A focus of this component has been on strengthening, broadening support to the WUAs created under Phase II, dissemination of this approach in the creation of functional WUAs along the pilot canals, and the management of these WUA's adopting IWRM principles.

For this purpose, a plan was developed in consultations with stakeholders that included canal management organizations, UCWU, BISA, BWMO, etc. Hydrographic composition of WUAs along pilot canals was developed and it became the basis for a wide range of social mobilization activities. In order to revitalize WUA governance bodies and make enhancements in water management, effective water users groups (WUGs) were established as an intermediate echelon to fill the institutional vacuum between WUA and large numbers of water users. The project has managed to activate WUAs, to take part in the canal governance through the Union of Canal Water Users (UCWU).

The whole process was reinforced with new methodological tools and recommendations, which were developed by the project teams. These included: improvements to existing legal frameworks that govern the basis of WUA establishment and the development process and mechanisms on the prevention and resolution of conflict. The project proposed a series of technical and technological recommendations on the organization of water accounting; alternative water allocation (daily and time based approaches); systems of water use monitoring; solutions to ameliorative issues; use of drainage water; and developing plans for maintenance and rehabilitation works. For the first time, a systematic WUAs business planning process was adopted that is a significant step in securing the sustainability of the institutions. This user driven business-planning guide was developed that specifically addresses the needs of WUAs that are non-profit making and the requirements for a water management organization. The set of issues related to functioning of WUAs were addressed in the manual for WUAs, which was

disseminated among specialists of ministries and other authorities related to water management through capacity building seminars.

2.1 Assist WUAs in the development and implementation of business plans, financial plans, O&M plans as well as rehabilitation and asset management

The project reviewed international experiences on Business Planning as an innovative approach to develop sustainable WUA's a concept that was new to the stakeholders. It became evident that acceptance of the concepts of business planning was difficult for WUA contextualize that had features that included the concepts of a non-for-profit organization, non-governmental and participatory environment and was not as a commercial business entity as is often perceived as the motivation of producing a business plan (BP). The analysis indicated that WUA BP is a new concept in irrigation management altogether, requiring certain shifts from a stereotype commercial business orientation, towards a more strategic development plan as its focus. Hence, to an extent, the BP tool developed by the project is unique. Its role was to assist water users (WUA councils, WUA management) to determine where the organization currently stands, where it wants to go and how to get there relying on the generation and mobilization of its own resources. This is in contrast to waiting for outside assistance (except in cases, when such outside help is justified through careful analysis of financial capabilities).

The BP development process also included the plans to reduce costs while increasing the efficiency and the reliability of WUA assets. The proposed guide to asset management includes the following steps: i) conducting a thorough asset inventory; ii) prioritizing the rehabilitation and replacement of WUA assets; iii) developing an annual estimate of needed reserves and an annual budget; iv) implementing the asset management plan; v) reviewing and revising the asset management plan.

The general guideline on BP developed for WUAs included BPs developed for WUA Akbarabad and WUA Japalak as examples. This guideline was assessed and adopted through a series of training-workshops in the Ferghana Valley. A total of 265 participants attended these workshops including WUA Council members, WUA directors, accountants, hydro-technicians and other stakeholders. BP-related outputs disseminated through publication of three articles and presentations at regional and national workshops.

2.2 Assist three pilot WUAs in addressing reclamation, drainage, groundwater and salinity issues.

Water-logging and salinization are frequent causes of yield loss of agricultural crops, that result in reduced farmers' incomes and affect their overall livelihood levels and in particular the ability to pay for WUA services.

The waterlogged areas of WUA Japalak were used as test area. The project assisted WUA staff to identify the cause of this water logging and specify measures to increase land productivity and overcome these problems. Aravan Akbura canal was found to be the main source of groundwater recharge. The canal crosses the WUA at a higher altitude allowing irrigation water supply by gravity for most parts of the WUA area. However, this is also the result of high seepage and low water use efficiency. Subsurface flows originating in the southern part of the WUA moved northward creating water logging on an area of 62 ha. A further source of shallow ground water is losses from irrigated fields. Losses from deep percolation and surface runoff can be calculated based on mechanical composition of soil and the area of sloping lands as suggested by N. Laktaev (Laktaev, 1978).

Preventive approaches proposed were to lower the groundwater table and reduce drainage outflows. Among effective water saving technologies proposed for sloping lands included contour irrigation, formation of oblique furrows, supplemental irrigation and water harvesting. Effective water saving technologies for lowlands could include alternate furrow irrigation and tail water reuse system. After adoption of these technologies, the balance area with shallow water table is proposed for growing sunflower, alfalfa and tree plantation.

The project developed criteria for assessing the status of irrigated land with respect to salinity and technical condition of drainage systems at WUA level, using the “Akbarabad WUA” as an example. Required information on the physical status of irrigated lands and technical condition of drainage systems were provided with a list of organizations having necessary information for assessment and analysis. Organization of land reclamation measures and the operation and maintenance (O&M) activities for drainage systems were reviewed.

Plans for land reclamation with expected results was prepared for the pilot WUA 'Akbarabad' over the short- and long-term. A range of issues were identified, which could be resolved through the interventions of the “Provincial Hydrogeologomeliorative Expedition (PHGME)”. Responsibilities of WUA and farmers respectively were defined concerning the collector-drainage network (CDN) operations. Recommendations on safe use of collector drainage water for irrigation in WUAs were developed. A Manual on addressing land reclamation problems in WUA” was prepared. The above mentioned recommendations and manuals were reviewed and approved by MAWR of Uzbekistan and recommended for use in other provinces of the Republic of Uzbekistan.

2.3 Assess the feasibility of alternative water allocation procedures and system management within pilot WUAs

The main objective of the water management within IWRM framework is to allocate and distribute water to all water users in an equitable and reliable manner. Preliminary studies carried out by the project revealed the following deficiencies in water management within emerging WUAs in general:

- Water allocation (water use) plans do not reflect real water demands by the WUAs due to organizational issues that are associated with the collecting and analyzing data from each farmer;
- Uncertainty of the cropping patterns for each consecutive season (except Uzbekistan where main crops grown are obligatory);
- Lack of appropriate capacity and skills among WUA staff;
- Outdated statutory crop water requirements (developed back in 1980s) - hydromodules;
- Water distribution is complicated due to the following reasons: insufficient number of water regulating structures, lack of water measuring devices, fluctuation of water delivery from main canals;
- Institutional gaps due to large numbers of water users requesting water simultaneously.

With the above in mind the project has developed, tested and applied two alternative approaches to water management in WUAs: i) daily water distribution and ii) time-based water distribution (Table 2.1 indicates the names of WUAs, where time based water distribution experiences were replicated).

The first approach is mainly appropriate for the conditions of Uzbekistan and partly for Tajikistan with the main features for this approach being large landholding size for each farm on average (more than 3 ha), prevailing crop monoculture; a smaller number of water users in each WUA (not exceeding 60); and availability of water measuring devices at each farm gate. Thus the water management procedure for a WUA with similar setting would be: direct contracts and water use plans made with and for each farmer, individual water requests received from each water user, water use plans corrected based on water requests, water delivered to each individual farm.

The second approach is designed for a setting with WUAs featuring large numbers of water users (more than 60), average land size per farm of less than 3 ha, diversified cropping patterns and unavailability of individual measuring devices at each farm gate. This is typical of Kyrgyzstan, where the average farm size is about 0.4 ha and the number of water users per WUA is more than 1000. Therefore, the water management procedure in such a setting would be organizing water users and their water demands at tertiary and lower canals into groups through establishment of WUGs. In other words:

- The WUA signs water agreements with each WUG instead of with each individual farmer (signing individual agreements is almost unrealistic);
- Water allocation plans are prepared for each canal shared by such a WUG;

- Each WUG collects water requests from its member water users and submits an aggregated request to the WUA;
- Comparing the water use plan WUA delivers water on the aggregated requests, through the outlet to tertiary canal. From this point onward, the WUG leader ensures equitable water distribution among all group members along the tertiary canal using ‘time-based’ water rotation system.

Implementation of water use plans at the on-farm level based on water demands (crop water requirements) and the proportionate allotment of actual water available requires precise water measurements at each farm gate. However, given huge numbers of farmers and their field turnouts within one watercourse this becomes an incredibly hard task. On average every such watercourse may consist of 10 to 100 turnouts, so measuring water at each one of them would require a significant workforce and water measuring devices to employ.

Table 2.1 WUAs & WUGs using time-based water distribution in Kyrgyzstan

| Name of the WUA | Number of WUGs | Number of users | Irrigated area, ha |
|-----------------|----------------|-----------------|--------------------|
| Joypas | 22 | 342 | 614 |
| Murza-Aji | 9 | 534 | 575 |
| Japalak | 8 | 367 | 142 |
| Isan | 20 | 541 | 528 |
| Jani-Arik | 4 | 80 | 82 |

It became evident in the process of implementation that in some places where people lacked good water allocation principles did attempt trying to find homemade solutions to problems associated with implementation but all such efforts lacked clarity, elaboration and systematic approach. This may in part be due to critical pre-requisites in for the successful implementation of this approach. In this respect, the method requires the following major organizational and technical arrangements to be in place:

- Close consultation with and agreement of water users and their full involvement in all stages of irrigation water planning, management and distribution. When preparing or changing irrigation schedules water users should be routinely informed and consulted through regular meetings, announcement boards, and other information transfer platforms.
- Technical conditions of tertiary canals such as high fluctuations in water discharges within the day needs to be addressed; and seepage losses or improper turnout structures must be repaired before introducing time-based water rotation.

Time-based water distribution approach was pilot-tested and modified in WUA Japalak’s tertiary canal Sokolok (Kyrgyzstan) and made functional in more than 60 WUGs in Kyrgyzstan, along the AAC.

Flow monitoring improvements

A listing of the water-measuring equipment manufactured and installed in the pilot WUAs using funds of “IWRM-Fergana” project are presented in Table 2.2.

Table 2.2 Types of water measuring devices installed in pilot WUAs

| Name of pilot WUA | Types of water-measuring Facilities | | | | Total (unit) | Gauging rods (unit) | Gauging Platforms (unit) |
|-------------------|-------------------------------------|-----------|---------------|-----------|--------------|---------------------|--------------------------|
| | CW, TW (unit) | SF (unit) | FC, CF (unit) | SN (unit) | | | |
| Akbarabad | 3 | 27 | 36 | - | 66 | 86 | 30 |
| Zarafshan | - | 20 | 1 | 5 | 26 | 43 | 9 |
| Zhapalak | 56 | 12 | 60 | - | 118 | 124 | 32 |

Note: CW - Chipolletti weir;
TW - Thomson weir;
SF - SANIIRI flume;

FC - fixed channel;
CF - calibrated flume;
SN - SANIIRI nozzles.

Additional requirements for water-measuring facilities in newly established private and dekhkan farms was addressed in the project and as of 31 December 2007, the total number of devices installed in two pilot WUA's amounted to:

- a. 118 units for WUA "Akbarabad";
- b. 43 units for WUA "Zarafshan";

Demonstration canals were used to develop recommendations for water accounting in newly established WUAs. An investigation of WUA demonstration canals indicated that in most cases water-measuring facilities and regulating gates are available only at the head of those canals. Few of the outlets to private farms are equipped with the aforementioned measuring and regulating devices. For example, only 117 or 29% out of 398 investigated outlets from demonstration canals to private farms were equipped with gauging stations, of which only 96 have regulating gates. This is a fundamental limitation with respect to the successful implementation of a time-based approach to water allocation.

Training of hydrometricians and irrigation engineers of newly established WUAs on the use of water use accounting system was undertaken at local level, this being delivered in the form of practical classes. During these trainings, under the guidance of a project consultant on hydrometrics, WUAs' staff inspected canal heads, prepared sites to install gauging stations, and selected the type of water-measuring device. Water-measuring devices were constructed, and equipped accordingly to the standards.

Technological aspects

A "Method for daily water use planning at WUA level" was developed considering the requirements of water use organizations for small farms as an alternative system of water distribution was developed. This approach resulted in the resolutions of the following issues:

- water supply to users, regardless of the size of their farming operation;
- equitable water distribution among users according to crop irrigation schedule;
- avoidance of infringement of canal tail users' rights to water;
- reduction of non-productive water losses in WUA irrigation network and improvement of irrigation network efficiency;
- involvement of water users in development and implementation of water use plan

This method of water planning focuses on:

- requirements for water use planning (hydro-module zoning, crop irrigation schedule);
- different techniques for water supply to water users' outlets (with continuous flows or concentrated flows);
- establishment of water user groups (WUG) growing homogenous crops;
- water supply to users according to their requests

Project has disseminated the accumulated experience on even and equitable water distribution among water users of newly organized WUAs, while keeping a track on actual water supply to pilot WUAs.

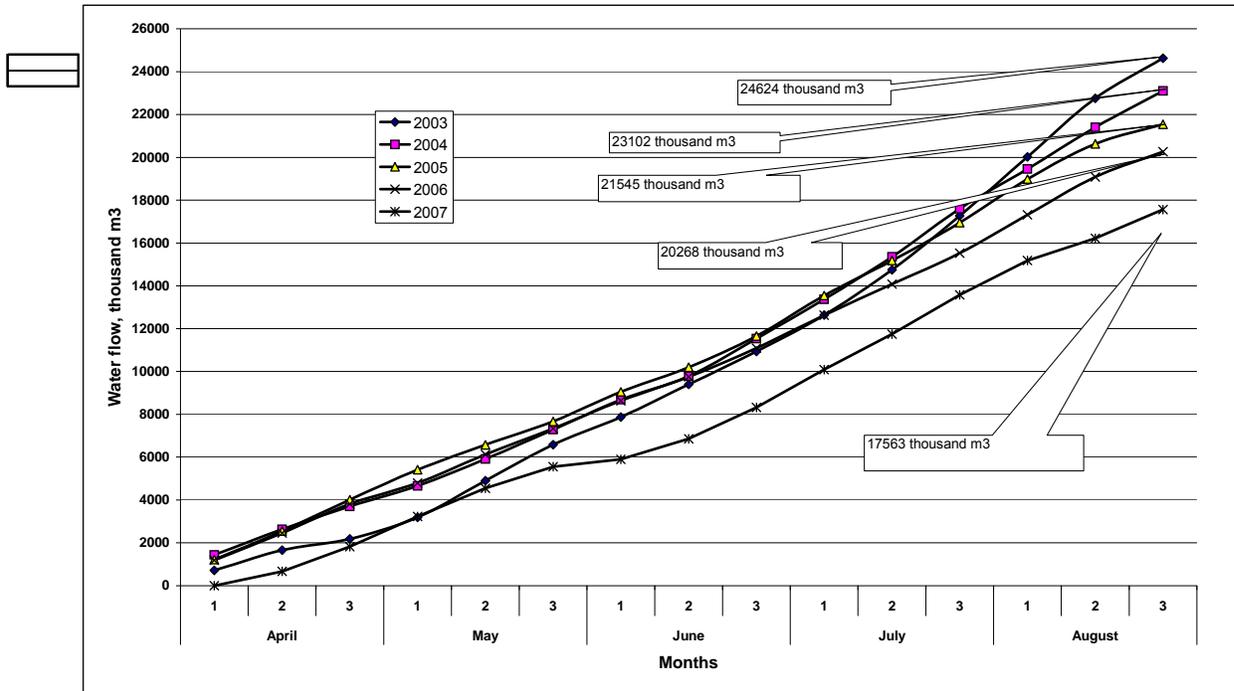


Figure 2.1 Dynamics of actual water availability in canals of WUA “Akbarabad”, as progressive total for growing seasons in 2003- 2007 (in thousand m³)

As it can be seen from Figure 2.1, the dynamics of actual water availability in canals of WUA “Akbarabad” as a progressive total over the growing seasons in 2003-2007 clearly indicate a tendency to decline. The total water use by the WUA for growing season in 2003, which coincides with the establishment of WUA, amounted to 24.6 million m³. Over the subsequent 4 years, there was a progress decline namely 23.1, 21.5, 20.3 and 17.6 million m³ during 2004, 2005, 2006 and 2007 respectively. This reduction is a positive factor feeding back to improving SFC canal operation capacity, and the formation and use of low-mineralized collector-drainage water.

A system for water use monitoring was created. It allowed for the resolution of the following:

- use of water from different sources on the farms;
- water availability for WUA, its’ canals and water users;
- dynamic communication between WUA and WMO, between WUA and water users;
- even water distribution among water users;
- stable water supply by WMO for WUA

The monitoring system in WUAs, allows introducing corrections to water supply dates and volumes for farms in their water supply schedules. The method is an improvement in the approach that has been used in the assessment of water availability for WUA, i.e. the assessment is not based on decadal indicators, but through the results of irrigations that are undertaken. This enables fair assessment of water availability for farms and interlinked activities of WUA and WMO. This monitoring system was introduced to newly established WUAs along South Ferghana (SFC) and Khojibakirgan (KBC) Canals through training of WUA staffs in the organizing monitoring and the use of methods for daily water use planning and analysis.

Table 2.3 Assessment of water availability in outlets located at the tail-end of canals and collectors of selected WUAs for the growing season of 2007

| WUA canals and collectors | Crop | Average water availability for WUG at the head of WUA DC (%) | Average water availability for WUG at the tail of WUA DC (%) | Ratio of water availability for WUG at the tail of DC to that at the head of DC (%) |
|---------------------------|------------|--|--|---|
| Akbarabad 1 and 2 | Cotton | 107 | 130 | 121 |
| | Wheat | 82 | 96 | 117 |
| | Vegetables | 37 | 42 | 114 |
| | Orchards | 74 | 77 | 104 |
| RP - 1 | Cotton | 130 | 132 | 102 |
| | Wheat | 91 | 96 | 105 |
| | Vegetables | 78 | 64 | 82 |
| | Orchards | 105 | 97 | 92 |
| RP - 2 | Cotton | 116 | 93 | 80 |
| | Wheat | 87 | 90 | 103 |
| Gandabulak | Cotton | 87 | 91 | 105 |
| | Wheat | 122 | 118 | 97 |
| | Vegetables | 63 | 63 | 100 |
| | Orchards | 84 | 80 | 95 |
| Okkuduk | Cotton | 111 | 98 | 88 |
| | Wheat | 115 | 104 | 90 |
| Ismailov | Cotton | 101 | 102 | 101 |
| | Wheat | 114 | 94 | 83 |
| | Orchards | 91 | 109 | 120 |
| Mashal | Cotton | 74 | 68 | 92 |
| | Wheat | 89 | 72 | 81 |
| | Orchards | 109 | 113 | 104 |
| Omad Zilol | Cotton | 90 | 87 | 97 |
| | Wheat | 91 | 100 | 110 |
| Povulgon Obi Khayot | Cotton | 72 | 91 | 126 |
| | Wheat | 94 | 101 | 107 |

By 2007, 62 WUAs were functional along SFC. Because of the considerable scope of work in all WUAs organized along SFC, the project executors selected one WUA with one demonstration canal in each district of Ferghana and Andijan provinces to analyze water use in WUA. Social mobilizers provided methodological assistance to the personnel of newly established WUAs in SFC and KBC zones in developing a daily water use plan, in terms of the demonstration canal.

The data in Table 2.3 indicate that since daily water use planning was introduced along the demonstration canals in SFC zone, there is almost no infringement of canal tail users' rights to water. The implementation of the "Method for daily water use planning at WUA level" and the water use monitoring system in newly established and functioning WUAs along SFC and KhBC, made possible to reduce conflicts related to water use between farms; water users and WUA; and WUA and canal management.

In 2007, the project team together with staff of WUAs established along SFC and KhBC carried out a water use analysis. This analysis focused on:

- planned water withdrawal for all irrigation sources per ten-day period, in progressive total for growing season;
- ratio of actual water supply to planned water supply;
- ratio of actual irrigated area to planned irrigated area

For all WUAs, reasons for actual deviation from the plan were identified in time and measures were taken to eliminate them. It can be observed from the data in Table 2.4 that the percentage of water withdrawal from **additional WUA sources** on a district wide basis varies - from 10% (Kuva district) to

32% (Bulakbashi district), and the irrigated area from 9% to 32% of the total irrigated area in the districts.

Table 2.4 *Water withdrawals and irrigated areas from different water sources for WUAs in districts located along SFC*

| Districts | Total irrigated area (ha) | Total water withdrawal for growing season (M m ³) | Including (%) | | Total hectare irrigations | Including (%) | |
|--------------|---------------------------|---|---------------|--------------------|---------------------------|---------------|--------------------|
| | | | From SFC | from addit. source | | from SFC | from addit. source |
| Khujaabad | 3450 | 25,35 | 85 | 15 | 15419 | 84 | 16 |
| Bulakbashi | 8630 | 59,27 | 68 | 32 | 39522 | 68 | 32 |
| Markhamat | 18624 | 116,3 | 87 | 13 | 43209 | 91 | 9 |
| Kuva | 22037 | 204,4 | 90 | 10 | 121065 | 89 | 11 |
| Tashlak | 9855 | 54,2 | 82 | 18 | 41781 | 87 | 13 |
| Akhunbabayev | 4258 | 40,55 | 87 | 13 | 23660 | 90 | 10 |
| Altiaryk | 5763 | 49,32 | 86 | 14 | 29640 | 86 | 14 |

Table 2.5 suggests that only 4 WUA of the 46 SFC WUAs do not have additional water sources, 54 % of WUA receive water from additional water sources within 1 - 20 % of total water withdrawal for WUA during the growing season. 37% of WUAs have water withdrawal from additional water sources that comprise 21-40 % of the WUAs requirements.

Table 2.5 *Assurance of WUA water withdrawals from additional sources*

| | WUAs with additional sources of water of 46 on SFC | | | | |
|----------------|--|--------|---------|---------|---------|
| Number of WUA | 4 | 13 | 12 | 6 | 11 |
| % total supply | 0 | 1 - 10 | 11 - 20 | 21 - 30 | 30 - 40 |

The SFC water infrastructure is unique and has complicated characteristics. SFC serves as the one reliable water source for three districts in Andijan province: Khodjaabad, Bulakboshi and Markhamat. Thus, during the growing season, the limit allotted for SFC is redistributed between three canals SFC, Savay and Kyrgyzaryk to increase water availability of canal command irrigated lands.

During acute water demand periods, SFC is required to supplement the supply of water to 4 districts in Ferghana province. In addition, in order to improve the availability for SFC command irrigated areas, water is sourced from Isfaramsai, Shakhimardansai, IDN, wells of vertical drainage and Kurgantepa and Karkidon reservoirs, that are regulating storages for Ferghana part of SFC. Tables 2.4 and 2.5 show that in the Andijan and Ferghana parts of SFC, that have large internal reserves due to additional sources, allows for the improving water availability to irrigated lands. There is a need to study and specify the character of water resources development in Ferghana and Adijan provinces.

Inter-district water rotation was introduced in the pilot KhBC area due to acute water deficits between two districts. The water rotation period was fixed at 6 days. B. Gafurov district takes water for three days and the other three days are for Dj. Rasulev district. The same order was adopted within Dj. Rasulev district, where 1.5 days water rotations were set between WUAs and farms. Depending on water requirements, a water distribution schedule was prepared for dekhkan farms. At the same time, priority was given to areas in need of irrigation water. However, water users did not have a clear understanding of the amounts of water needed for irrigation. In 2007, efforts were made to adapt 'daily water distribution' within the context of the introduced 'inter-district water rotation' approach. Water users were divided into two groups. The first group received water for the first three days in the water rotation and the second group received water over the remaining three days. Daily water

discharges of each group were calculated separately and correction coefficients of supplied water per 1 ha were defined for each water rotation cycle through the ratio of allocated canal water volume to required daily water volume. Daily water rotation schedules were corrected using the calculated coefficient. The corrected daily schedule was used as the basis for water use monitoring within the WUA.

Table 2.6 *Water supply indices between Ak-Kalya canal head and tail*

| №№ S.n. | Outlets | Irrigated area, ha | Water supply indices, thousand m ³ | | Average water availability, in % | Ratio of water availability (tail /head) in % |
|-----------------------|--------------|--------------------------|---|------------|---|--|
| | | | Planned | Actual | | |
| I. Canal head | | | | | | (41 / 44) * 100 = 93,2 |
| 1 | Yarmagz | 16,1 | 165 | 58 | 35 | |
| 2 | Khudgif-1 | 14,6 | 153 | 64 | 42 | |
| 3 | B. Khamdamov | 60 | 734 | 300 | 41 | |
| 4 | Yarmagz-2 | 50,7 | 525 | 274 | 52 | |
| | Total | 141,4 | 157,7 | 696 | 44,0 | |
| II. Canal tail | | | | | | |
| 1 | Sugd -1 | 16 | 187 | 81 | 43 | |
| 2 | Somon-1 | 46 | 575 | 266 | 46 | |
| 3 | Sugd-2 | 25 | 332 | 123 | 37 | |
| 4 | Sugd -3 | 40 | 463 | 164 | 35 | |
| | Total | 127 | 1557 | 634 | 41,0 | |

Table 2.6 indicates that as a whole, water availability for farms in Ak-Kalya canal outlets ranged between 35 - 52%. However, water availability of tail farms was 93.2 % of head users. Partly, it was due to water resources being accessed from the Syrdarya by pumping as well as some water released from upper irrigated fields that were used to improve water availability of farms served by Ak-Kalya canal. As impact assessment of the principles and water management methods implemented by the project on water use productivity (crop yield) was not provided for during Phase III, the project will provide for such impact assessment the activity in farms-indicators at CMO – WUA levels during Phase IV. Two farms with typical cropping mix have been selected in each WUA, and calculation of costs for agricultural production in physical and money values and follow-up calculation of agricultural production profits on irrigated lands per water supply unit will be made within these farms.

Availability of water in KhBC, depends mainly on climatic conditions around the upper catchments of the river. It has no regulating storage and water supply from pilot canal to WUAs such as Zarafshan is highly variable. This WUA was regularly undersupplied with respect to planned water volumes (15,0 - 16,5 million m³ depending on the crops grown). With the project interventions, the WUA Zarafshan experienced a relative increase in water supply (Figure 2.2). During the 2003-2006 period, water supply increased from 5679 thousand m³ (2003) to 7568 thousand m³ (2005) and then declined slightly to 7256 thousand m³ in 2006. However, in 2007 actual water supply volume was reduced to 5678 thousand m³ (Figure 2.2) due to acute water shortage in the source river.

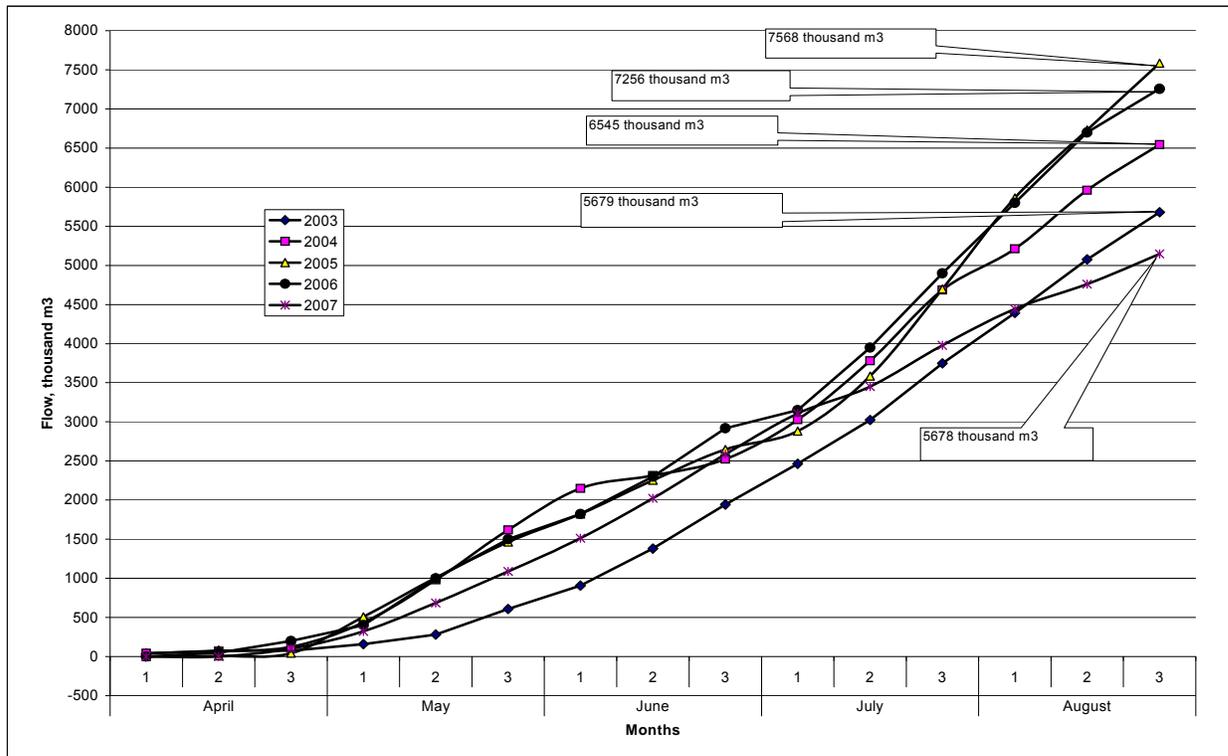


Figure 2.2 Dynamics of actual water availability for WUA Zarafshan by progressive total for the growing season 2003 - 2007, thousand m³

Conclusions and suggestions for water use in WUA:

The following conclusions and suggested changes can be drawn from the aforementioned initiatives:

1. Daily water use method and its correction in WUA according to submitted water applications was shown to be highly effective in addressing water supply issues. Water supply timeliness, availability and WUA operations for the growing season can be assessed using data on daily water distribution. Regular monitoring allows the identification of defects in water distribution in a timely manner and allows the necessary corrective actions to be implemented.
2. Daily water use planning has enabled the organization to have an effective water distribution method and reduce water losses in WUA canals. In 2007, daily water use planning applied in WUA Akbarabad enabled an increase in service factors of WUA canals from 0,66 up to 0,78.
3. Assessment of water availability in water user outlets located at the tail-end of canals indicated that daily water use planning was effective in addressing problems related to water availability for water users in this section of the canal.
4. The proposed interface between SFC and WUA demonstrated its high effectiveness. At the beginning of each decade, WUAs were informed of the water supply to WUA canals based on the existing water-related situation in SFC.
5. During low-water periods 2006 - 2007, when water resources were limited in SFC area, arrangements for collector-drainage water use in WUAs were undertaken. It resulted in improving WUA water availability by 25 - 30 % on average.
6. Project IWRM-Ferghana recommended using a new methodology on water use planning for existing WUAs. However, all existing WUAs used the out dated methodology of decade planning in record keeping, as they are receptors of former collective farms and state farms. The complete normative documentation for WUA record keeping should be prepared on the basis of daily water use planning and submitted to MAWR of Uzbekistan for introducing into record keeping of water management structures.
7. Dynamic communication links should be established between WUA and canals and WMO as proposed by SIC ICWC. Such a link could provide information to WUAs on forthcoming water supply in timely manner based on given canal water-related situation.

Daily water distribution was pilot-tested in WUA Zaravshan (Tajikistan) and WUA Akbarabad (Uzbekistan).

The following documents were prepared for the use of stakeholders:

- Water distribution guidelines for WUAs;
- 5 Modules (crop water requirement, water measurement, water use plans, water distribution and performance assessment);
- Guidelines on monitoring and evaluation for CMOs;
- Methodology on calculating key water performance indicators using MIS (management information system);

2.3d Identify options for financing infrastructure upgrade and rehabilitation in collaboration with governments/ donor funded projects and other mechanisms

Since 2006 the project with support from SDC has been running a small grants program for WUAs in the project areas to support improvement to their water distribution system through construction of hypoposts (water measuring and regulating devices). In 2006-2007, 10 WUGs in 6 WUAs along AAC, Kyrgyz Republic and 10 WUGs in 3 WUAs along KhBC, Tajikistan were supported in this manner. In 2008, a total of 96, 96, and 144 water measuring and regulating devices were planned for construction respectively in Kyrgyz Republic, Tajikistan and Uzbekistan.

Securing outside funding for and by WUAs:

In Kyrgyzstan WUA Japalak and Jani-Arik over the period 2005-2008 were successful in applying for and obtaining soft loan-based special funding from the World Banks “On-farm irrigation” project, aimed at rehabilitation and upgrading of WUA infrastructure. WUA Isan succeeded in obtaining small grants from the ARIS program in Kyrgyz Republic for canal rehabilitation purposes. WUA Joypas was given a grant from USAID/WUASP’s technical support program mostly for the construction of hypoposts and office upgrading. In Tajikistan, WUA “Zarafshan” was successful in obtaining a grant from ACTED to construct water-measuring devices. In Uzbekistan, WUA “T. Mirzaev” obtained funding from the World Bank to purchase some devices. In 2006, WUA Khojibek-Zoirjonobod participated in small grants program of Uzbekistan National Association of NGOs.

Further in 2008, the project:

- Found and distributed information among WUAs and UCWU regarding the “Small Grants Program” announced jointly by the World Bank and the Eurasia Foundation in Kyrgyz Republic.
- Distributed information among WUAs and UCWU in Tajikistan concerning the “Civil Society Fund” program (former Small Grants program) announced by the World Bank in Tajikistan.
- Distributed information among WUAs and UCWU in Uzbekistan pertaining to the Social Development Civil Society Fund program (former Small Grants program) announced by the World Bank in Uzbekistan as well as a small grants program run by the US Embassy in Uzbekistan.

2.4 Developing and assisting in the establishment of WUAs/WUGs along the entire/most part of KBC and SFC

The SMID approach designed for establishing new WUAs through several logical steps that was found to be successful in the previous project phases (awareness building, diagnostic analysis, consultations, and election of representatives, initiative groups, founding documents, capacity building, and registration) was used in this activity. The focus of SMID activities in the third phase was to disseminate pilot WUA experiences (using pilot WUAs as a benchmarks) along the entire or most parts of the pilot canals, establish new WUAs along hydrographic boundaries that are able to ensure equitable, reliable and timely water distribution among their member water users. The challenge when implementing the above in the new areas of pilot canals (KBC and SFC) was that most local WUAs were established through a top-down approach with farmers neither consulted nor informed.

Among the numerous problems faced by such WUAs they included ineffective water management, conflicts among water users, poor irrigation service fee collection, WUA staff retention, incapacity of WUAs to meet water requests of all water users, no legal obligations/contracts with water users on water delivery, no planning and proper documentation, debts accumulated from old collective farms. Thus, the project developed a new SMID strategy that focused on expansion rather than concentration on any one place. With this in mind, the project recruited teams of local field consultants and social mobilizers, who were extensively trained on IWRM and SMID aspects and approaches. As a result, a new strategy was adopted for WUA development with monitoring systems put in place for timely coordination and implementation of field activities (See Table 2.7).

Table 2.7 SMID activities and strategies for expanded WUA development along entire/ parts of pilot canals

| | Items | Objects | | | |
|----|--|--|-------|---|--|
| | | AAC | RBC | KBC | SFC |
| 1. | Number of hydrographic WUAs established and existing | 6 | 18 | 5 | 12 |
| 2. | Administrative WUAs where SMID is under process | - | - | 5 | 64 |
| 3. | Established WUGs by SMID teams | 26 | 2 | 35 | 18 |
| 4. | Established WUGs by Self-initiative of WUAs | 37 | 7 | 33 | 25 |
| 5. | WUA development strategy | <ul style="list-style-type: none"> - Elimination of hydrographic inconsistencies; - Establishment of WUG and activation of WUA councils - Formalization of WUGs and agreements with WUA - Training on water management, basic documentation and business plans, performance indicators | | <ul style="list-style-type: none"> -Mapping of potential WUAs; -SMID activities in non-dismantled farms; -Involvement of UWU in WUA reorganization; -Establishment of WUGs; -Training on water management, basic documentation and business plans, performance indicators. | <ul style="list-style-type: none"> -Mapping of potential hydrographic WUAs; -Reorganization of administrative WUAs and involvement of UWU; -Establishment of WUGs in problematic zones; -Training on water management, basic documentation and business plans, performance indicators. |
| 6. | Number of SMID team | 6 | | 6 | 10 |
| 7. | Total area, ha | 9125 | 18000 | 8600 | 96215 |
| 8. | Area where SMID activities undertaken, ha | 8647 | 5600 | 3245 | 48107 |
| 9. | Monthly informal network of WUA leaders | ✓ | ✓ | ✓ | ✓ |

Overall, SMID activities in each country were designed using the following framework:

- development of a master plan for WUA creation (upon consultations with key stakeholders CMOs, UWUs, CWC) including assistance in developing a conceptual map of potential hydrographic WUAs along SFC and KBC;
- the initial SMID steps (including legal procedures) to convert or reorganize existing administrative WUAs into hydrographic;
- further strengthening established hydrographic WUAs

Hydrographic WUA strengthening was carried out using the following approaches and tools:

- Water management (on-site trainings on water use plans, rotational water distribution, water measuring, performance indicators);
- Organizational improvements (new management tools such as business planning, benchmarking, performance assessment, SWOT, basic documentation)
- Strengthening WUA councils (establishing effective Water User Groups - WUGs, participatory and alternative assessment tools for water users)

Information on the establishment of WUGs in the selected WUAs is presented in Tables 2.8- 2.10. However, the whole and full picture of WUA and WUG development by countries is presented in the Tables 6.3-6.5, where the project staff did an inventory of finished (with symbol “+”) and unfinished tasks (with symbol “-”).

For effective multiplication and dissemination of various processes, ideas and knowledge aimed at sustaining new WUAs the project encouraged adoption of innovative knowledge sharing tools. Among them were establishing and facilitation of ‘informal network of WUA leaders’ in the project areas, ‘farmer to farmer’ days, organization of experience sharing tours for active WUA leaders and SMID team members and a Knowledge Fair in Osh.

Table 2.8 Numbers of WUGs established in Kyrgyzstan

| No | Name of WUA | Main canal | Number of WUGs | Number of water users | Area ha |
|----|--------------|------------|----------------|-----------------------|-------------|
| 1. | Japalak | AAC | 8 | 367 | 142 |
| 2. | Isan | AAC | 20 | 541 | 528 |
| 3. | Joypas | AAC | 22 | 342 | 614 |
| 4. | Murza-Ajy | AAC | 9 | 534 | 575 |
| 5. | Jany-Aryk | AAC | 4 | 80 | 82 |
| 6. | Shark Uvam | RBC | 2 | 57 | 43 |
| | Total | | 65 | 1921 | 1984 |

Table 2.9 Number of WUGs established in Uzbekistan (only in problematic zones)

| No | Name of WUA | Main canal | Number of WUGs | Number of water users | Area ha |
|-----|---------------------|------------|----------------|-----------------------|-------------|
| 1. | Omad Zilol | SFC | 1 | 25 | 105 |
| 2. | Zilol Suv Fayzi | SFC | 1 | 13 | 358 |
| 3. | Tolmozor chashmasi | SFC | 2 | 21 | 196 |
| 4. | Musajon Ismoilov | SFC | 3 | 18 | 188 |
| 5. | Hojibek Zoirjonobod | SFC | 3 | 21 | 283 |
| 6. | Istikolol | SFC | 1 | 17 | 106 |
| 7. | Tomchi kul | SFC | 1 | 13 | 45 |
| 8. | M. Tojiboev | SFC | 1 | 25 | 115 |
| 9. | Pahtakor | SFC | 1 | 6 | 78 |
| 10. | Ma’shal | SFC | 1 | 17 | 23,6 |
| | Total | | 15 | 176 | 1503 |

Table 2.10 Number of WUGs established in Tajikistan

| No | Name of WUA | Main canal | Number of WUGs | Number of water users | Area, ha |
|----|--------------|------------|----------------|-----------------------|-------------|
| 1. | Tochikobod | KBC | 6 | 1361 | 681 |
| 2. | Madaniyat | KBC | 7 | 1579 | 789 |
| 3. | Zaravshan | KBC | 22 | 2837 | 1033 |
| | Total | | 35 | 5777 | 2503 |

Based on this SMID experience the project developed guidelines explaining the importance and practical steps to establishing WUGs. The steps include identification of most problematic zones in any particular WUA; conducting a walk-through survey of outlets; holding initial discussions with farmers of their issues faced and identifying the most active water users; presenting the farmers with basic WUG concepts; facilitating water users to elect their WUG leader; follow up and training activities.

The support provided to such WUG initiatives resulted in:

- a greater participation of farmers;

- improved relationships between the WUG concerned and their WUAs;
- increased confidence of respective WUAs to mobilize their own resources and water users for gradual infrastructural improvements;
- wider awareness on WUG roles among target audiences and the establishment of other WUGs by the WUAs themselves;
- more vigorous SMID activities;
- a greater sense of ownership over the installed structures among the water users;
- a decreased number of conflicts;
- better equity in water distribution;
- more prestige of a WUA among its WUGs;
- a better responsiveness to water management decisions.

Currently, SMID activities are designed to support WUAs in establishing their own WUGs. The following impacts could be observed due to this intensive SMID drive:

- conceptual maps of potential WUAs were dynamically developed and agreed with respective UWUs of SFC and KBC;
- 24 hydrographic WUAs are being developed, assisted and strengthened along pilot canals over a total area in excess of 30,000 ha;
- 57 WUGs in Kyrgyzstan, 12 WUGs in Uzbekistan and 32 WUGs in Tajikistan have been established resulting in improved water allocation, distribution, greater user participation, more active WUA councils, decreased number of conflicts among farmers, and improved ISF collection;
- WUA networks are active along SFC and KBC;
- 22 field consultants (10 in Uzbekistan, 7 in Kyrgyzstan, 5 in Tajikistan) have been trained to apply effective SMID tools directed at establishing bottom up WUAs, federating and activating canal governance bodies, creating effective WUGs for better water productivity;
- Several WUAs along the AAC are starting to recover from previous debts and gain confidence (WUA Joypas, Murza-Aji and Isan);
- ISF collection along AAC improved from 28% in 2004 to 82% in 2006 due to increased support from water users towards their WUAs;
- Time based water distribution was successfully introduced and practiced along tertiary canal Sokolok, WUA Japalak (Kyrgyzstan);
- Daily water distribution method was successfully introduced and practiced in WUA Akbarabad (Uzbekistan) and WUA Zaravshan (Tajikistan)

The following guidelines have been developed to facilitate WUA development and strengthening:

- A set of Training Modules on Water Management for WUAs including crop water requirements, water measuring, developing water use plans, water distribution, and performance assessment were developed
- Guidelines on Alternative Water Distribution for WUAs (Daily and Time Based Water Distribution in WUAs)
- Guidelines on Establishing Effective WUGs
- Guidelines on Measuring and Monitoring Water Use
- Guideline on integrated water resources management at the WUA level;
- Manual on planning and executing repair and rehabilitation operations in WUAs;
- Manual on resolving reclamation problems in WUAs;
- Recommendations on collector-drainage water use for irrigation;
- Recommendations on adjudicating of disputes at the WUA level

2.5 Share and disseminate Social Mobilization Methodology to other development projects

In April 2005, the WUA Support project funded by USAID's Counterpart Consortium (CC) in South Kazakhstan, requested support from the IWRM-Ferghana project to build capacities of 10 WUAs in Makhtalar District. The project staff conducted a series of trainings (accompanied by pre- and post-training assessments) covering a range of water management aspects for WUAs. In March 2006, CC extended the consultancy to train WUA staff including directors in South Kazakhstan, on development of water use plans. Later, Counterpart Consortium contacted IWMI requesting to the training of WUAs in Turkestan, on water management. To make such trainings local and specific, a series of walk-through surveys and interviews were held with water users to identify their problems and training needs. As a result, 25 WUA directors and hydrotechnicians from Turkestan were trained. The post-

training assessment suggested that following this 75% of WUAs developed actual water use plans. However, WMOs of the region are often unable to supply the planned water needs. A number of experience sharing seminars were organized jointly with other development projects in 2007 involving 30 representatives from Kyrgyzstan (WUASP, ARIS, Merci Corps, Jer Azigi, World Bank's On farm irrigation project) and 28 representatives from Tajikistan (ACTED, CECI, APPR-NAU, World Bank's Water Management in Ferghana Valley project).

2.6 Assess project impact on WUA development using users' satisfaction surveys, WUA records, etc.

The project has continued the perceptions surveys of water users from 3 pilot WUAs under the IWRM Ferghana project, since 2003. The 3 study WUAs are WUA Akbarabad in Uzbekistan, WUA Zarafshan in Tajikistan and WUA Isan (formerly, Kerme-Too Akburasi) in Kyrgyzstan. The preceding 2 surveys conducted in 2003 and 2004 aimed at establishing a baseline measurement of irrigation performance, repairs and maintenance status, crop production and other relevant measures as well as following them up from time to time to assess the dynamics and impact since the initiation of the project interventions.

The 2005 and 2006 surveys focused predominantly on the quality of irrigation services both for farms and kitchen gardens, the maintenance status of the WUA infrastructure as well as the users' general satisfaction with the services provided. Overall, 182 water users were sampled and interviewed in all 3 WUAs, which make about 60 respondents per site. Three site-specific WUA questionnaires were re-designed and tested in mid-January, with major focus on WUA performance assessment. This was complemented by pre-survey on-the-job training of 5 field survey technicians, with detailed written guidelines given to them for sampling and interviewing. Data entered were processed, cross-tabulated and analyzed. Results indicate that except for Zarafshan, other WUAs are moving ahead. Main Zarafshan retardants were the supply from canal and new management of the WUA. The last survey draft report prepared in September 2007.

Table 2.11 *Technical and economic indices for farms - WUA Akbarabad water users in pilot SFC area in Uzbekistan during 2003 - 2006*

| Indices | SFC area | | | |
|--|---------------------|---------------------|---------------------|-------------------|
| | 2003 | 2004 | 2005 | 2006 |
| Serviced irrigated area, ha | 2820 | 2820 | 2830,8 | 2830,8 |
| Unit indices per 1 ha | | | | |
| Actual water withdrawal volume, thousand m ³ /ha | 8,7 | 8,2 | 7,6 | 7,5 |
| Actual water supply volume, thousand m ³ /ha | 6,9 | 6,8 | 7,0 | 6,9 |
| Value of agricultural production (crop production), \$/ha | 528,3 ^{*)} | 578,2 ^{*)} | 683,5 ^{*)} | 700 ^{*)} |
| Raw cotton yields, centner/ha | 28,7 | 27,2 | 31,6 | 32 |
| Costs of agricultural production (crop production), \$/ha | 479,7 | 529,8 | 595,2 | 593 |
| Including: - actual costs, WUA, \$/ha | 3,2 | 3,3 | 4,3 | 6,7 |
| Profit from agricultural production (crop production), \$/ha | 48,6 ^{*)} | 48,4 | 88,3 | 107 |
| WUA costs in % of crop production profit | 6,6 | 6,8 | 4,9 | 6,3 |

Rate of Uzbekistan currency against USD:

In 2003 1 \$ = 977 soum
 In 2004 1 \$ = 1060 soum
 In 2005 1 \$ = 1165 soum
 In 2006 1 \$ = 1240 soum

Note:

*) - at farm level

Table 2.12 Technical and economic indices for farms - WUA Zarafshan water users in KhBC area in Tajikistan for 2003 - 2006

| Indices | KhBC area | | | |
|--|-----------|-------|-------|-------|
| | 2003 | 2004 | 2005 | 2006 |
| Serviced irrigated area, ha | 1050 | 1050 | 1050 | 1050 |
| Unit indices per 1 ha | | | | |
| Actual water withdrawal volume, thousand m ³ /ha | 5,4 | 6,2 | 7,2 | 8,3 |
| Actual water supply volume, thousand m ³ /ha | 4,8 | 5,2 | 5,8 | 7,3 |
| Value of agricultural production (crop production), \$/ha | 599,2 | 525,1 | 610,4 | 554,3 |
| Raw cotton yields, centner/ha | 19,3 | 22,8 | 23,2 | 23,4 |
| Costs of agricultural production (crop production), \$/ha | 391,8 | 492,2 | 503,5 | 527,1 |
| Including: - actual costs for WUA, \$/ha | 3,5 | 2,13 | 3,43 | 4,49 |
| Profit from agricultural production (crop production), \$/ha | 207,4 | 32,9 | 106,8 | 27,2 |
| WUA costs in % of crop production profit | 1,7 | 6,5 | 3,2 | 16,5 |

Rate of national currency against USD:

1 \$ = 3,12 somoni (Tajikistan)

According to technical and economic indices for WUA Zarafshan, it is noted that in overall there is a positive trend of yield increase for main product - raw cotton from 19,3 centner/ha in 2003 up to 22,28 - 23,4 centner/ha in the last 2004 - 2006. However, price reduction for ginned cotton provided at the exchange, impacts on agricultural production profitability (crop production).

Table 2.13 Technical and economic indices for farms - WUA water users in pilot AAC area in Kyrgyzstan for 2002 - 2006

| Indices | AAC area WUA Zhany Aryk | | | | |
|--|-------------------------|-------|------|-------|-------|
| | 2002 | 2003 | 2004 | 2005 | 2006 |
| Serviced irrigated area, ha | 1006 | 1006 | 1006 | 1006 | 1390 |
| Unit indices per 1 ha, \$/ha | | | | | |
| Actual water supply volume, thousand m ³ /ha | 11,3 | 11,1 | 7,3 | 9,9 | 7,0 |
| Value of agricultural production (crop production), \$/ha | 552 | 604,7 | 683 | 614,6 | 586,6 |
| Costs of agricultural production (crop production), \$/ha | 219 | 239,5 | 282 | 312,2 | 298,1 |
| Including: - Actual costs, WUA, \$/ha | 1,95 | 2,14 | 2,44 | 8,95 | 2,83 |
| Profit from agricultural production (crop production), \$/ha | 333 | 365,2 | 401 | 302,4 | 288,5 |
| WUA costs in % of crop production profit | 0,6 | 0,6 | 0,7 | 2,95 | 1,0 |

Rate of Kyrgyzstan currency against USD:

1 \$ = 43 som in 2002 - 2004

1 \$ = 41 som in 2005

According to technical and economic indices for agricultural production in WUA Zhany Aryk farms, there was a reduction in profitability from agricultural crop production from 401 \$/ha in 2004 up to 302,4, 288,5 \$/ha in 2005 and 2006 consecutively. Instability in market prices were the cause for these declines.

Difficulties and problems encountered by the WUA development group:

1. Water specialists from newly established WUAs along SFC and KhBC have low educational levels that make the transfer of knowledge somewhat more difficult. It will require greater effort to up-scale results of pilot WUAs to newly established initiatives.
2. Only 30 % of canal outlets in newly established WUAs along KhBC and SFC, where there are many water users, have water accounting facilities and regulating gates. This situation is not conducive in implementing qualitative distribution of water between small water users, which leads to conflict situations developing.
3. There is a need for regulating operational relationships between WUAs and homestead lands. A person should be elected to be responsible for water distribution in makhallyas or rural administrations or assure water delivery and distribution between owners of homestead lands. A lack of legislation to conclude agreements between makhallya and WUAs, to revise water delivery norms for homestead taking into account real crops grown in them is a potential issue.
4. 'Methodology on daily water use planning and monitoring at WUA level' proposed by SIC IWC, should be introduced on-site through the efforts of MAWR and its structures instead of decadal water use planning and monitoring traditionally used in WUAs.
5. There is a need for a state support program for WUAs with respect to the:
 - a) Rehabilitation of on-farm irrigation and collector-drainage network;
 - b) Creation/ improving of resource base of WUAs;
 - c) Access to soft credit for WUAs;
 - d) Establishment of WUA Support Units in provincial structures under MAWR, in particular, for installing water accounting facilities in WUAs, training WUA staff, providing WUAs with various guidelines and manuals, etc.;

Result 3: Dissemination of Improved Technologies for increasing water and land productivity at the field level

Based on recommendations developed in Phase 2 on irrigation water use and agro-technical measures, including existing experiences of national research systems, the project generalized approaches for improving water and land productivity, disseminated through identified partners, involved in agricultural extension by dissemination bulletins and intensive training of consultants.

The activities were carried out to correct hydro-module zoning, maps of different soil types, and ameliorative conditions based on irrigation norms that were reviewed and handed over to irrigation staff for evaluation and maintenance. In three states of the Fergana Valley, key issues that affected the productivities of farming systems were identified. Based on problem analysis the relevant recommendations were made to the governing bodies. On the demonstration sites established in 2002, the monitoring activities on the use of irrigation water and agro-technical measures with technologies developed under the project were continued. The assessment demonstrated that there is a strong basis to confirm the sustainability of these production systems and the approaches recommended.

A list of retired/ former employees of government farms and other experts (Agronomist, irrigation, livestock, farm managers, etc) who would like to assist WUAs has been established. They were 'assigned' to neighboring WUAs and requested to assist when called upon. These consultants were oriented on IWRM and WUA approaches. It is proposed to link this team with Universities, who has signed agreements with project, for updating of their knowledge.

3.1 Prepare guidelines /manuals for trainers on principles of land and water productivity improvement know-how and water demand calculation based on Phase 2 results

3.1a Summarizing methodology and know-how on water and land productivity, developing dissemination tools, their adaptation to specific field conditions, irrigation schedules, etc.

Preparing manuals for trainers and professionals

The project prepared manuals for staff of extension services. Most manuals were developed and presented in 2005. These include: “Recommendations for selection of technological schemes of irrigation”, “What is crop irrigation regime”, “Manual for calculation and selection of cotton and winter wheat irrigation depths and elements of technique, based on results of IWRM-Ferghana project”, “Manual for selection of water meter type, construction and operation requirements”.

In 2006, manuals on extension services for farmers were developed. These manuals contain information on extension work with farmers; on how to use both visual estimations and farm surveys; and the collection of necessary information on each farm. For regulation of irrigation dates and depths, a manual was developed for technicians and farmers “Practical recommendations for irrigation water use in farms”, where methods for setting dates and depths for each irrigation are described based on the climatic information (daily evaporation) and on water accounting.

In 2007, the manual “Methods of water distribution within water-user group with small plots” - the example of Sokolok canal (Kyrgyzstan)” was prepared.

Preparing bulletins for farmers and their dissemination through extension services

Based on the recommendations and manuals for rational irrigation water use and agricultural operations developed for technicians and trainers, the regional and oblast project executors have prepared and developed bulletins for farmers. Table 3.1 presents the information about partners and dissemination activities.

Table 3.1 *Dissemination of bulletins through existing extension services and local water organizations*

| Name of provinces and extension services | Number of farms included | Number of bulletins disseminated among farmers |
|---|---------------------------------|---|
| ASDP-NAU | 76 | 380 |
| CECI | 72 | 360 |
| BAIS and WUA Akbarabad | 350 | 1750 |
| Khakimiyat and MTP | 600 | 3000 |
| BAIS and sh/f Bulakboshi | 420 | 2100 |
| Total | 726 | 7154 |

Since November 2005, the project has organized training for farmers of WUAs included into the project and located on irrigation areas of pilot canals - SFC in Uzbekistan and KhBC in Tajikistan. In general, 5 WUAs and 285 farmers were contacted in Ferghana province, 10 WUAs and 399 farmers - Andijhan province, and 8 WUAs and 132 farmers - Sogd province. In total, 3264 bulletins were disseminated (Table 3.2)

Table 3.2 Dissemination of bulletins among farms through training

| Province | Rayons | WUA | Number of farmers | Number of bulletins disseminated |
|---------------------------------|-------------|---------------------------|-------------------|----------------------------------|
| Andijan | Kurgantepa | Sobirjon suv bulogi | 51 | 204 |
| | | "Mashrapboi sahovati" | | |
| | | "Khamraboyev sahovati" | | |
| | Dzhalakuduk | Amir Temur | 85 | 340 |
| | | "Zhalakuduk vodiy imkoni" | 55 | 220 |
| | | Pakhtakor gidrotech | 54 | 216 |
| | Khadjiabad | Chinmakhrum | 86 | 344 |
| | | Madiyarova | | |
| Khojaobkash | | 68 | 272 | |
| Garagura | | | | |
| Fergana | Kuva | Tolmazar chashmasi | 63 | 252 |
| | | Mushajon Ismoilov | 54 | 216 |
| | | Omad Zilol | 69 | 276 |
| | | Zilol suv faizi | 50 | 200 |
| | | Polvontosh Bakhor | 49 | 196 |
| Sogd | Dj.Rasulov | Madaniyat | 33 | 132 |
| | | Zerafshan | 33 | 132 |
| | | Tajikabad | 33 | 132 |
| | | Samatov D/H | 33 | 132 |
| Total be January 1, 2008 | | | 816 | 3264 |

3.1b Zoning of command area according to hydromodule zones using GIS and RS.

In order to define more precisely the boundaries of hydromodule zones and the correct irrigation regime to be implemented, since 2005 to 2007, the GIS team has collected mapping data on the study area in Uzbekistan (Fergana and Andijan provinces) and Kyrgyzstan (Osh province). By using these data, thematic layers were generated to represent the status and its analysis (administration division, hydraulic infrastructure, soils, network of observations well for water table, soil salinization, farm location in WUAs Zhapalak, Akbarabad, Zarafshan). For Tajikistan, data were not submitted by provincial executors due to the non-availability of the former in provincial organizations.

Calculation of water use parameters for hydromodule zones. Guidance and planning of water use correction according to current climatic parameters

Assessment and analysis of irrigation water use in the IWRM-Fergana project zones over the period 2001-2005 indicated that on some plots of the irrigated zone (especially in the Uzbek part of Fergana valley) land conditions changed significantly, thus resulting in inconsistency between standard irrigation regime and watering depths and actually needed ones. For actual water use planning, since 2006 the project has attempted to correct irrigation regimes and watering depths based on changed conditions.

For this purpose, maps with different combinations of soils and irrigated land conditions were produced. By using these maps, initial options for watering depths were estimated and submitted to irrigation services for testing. By processing mathematical expression, a more disciplined approach to water use estimation was found. In 2007, the obtained preliminary results were corrected according to indicators.

Regulatory and normative documents for the establishment of extension services

The project has identified major obstacles for farming and factors which influence agricultural productivity were identified in all three states of Fergana valley (Kyrgyzstan, Uzbekistan, and Tajikistan). These obstacles were analyzed and respective proposals for governing bodies were prepared through the project NCSGs. Following brochures were prepared: “Farms in the Republic of Uzbekistan: rights and responsibilities” and “Law of the Republic of Uzbekistan on farms. Issue 1”. These brochures were disseminated among trainers of polygons in Andijan and Ferghana provinces to work with farmers and among 10 WUAs in Ferghana province in SFC zone for guidance and assistance to farmers. A brochure entitled “Law of the Kyrgyz Republic on peasant farms” was prepared for multiplication and dissemination through RAS consultants in Osh province. In addition legal information about principles of agricultural cooperative establishment and activities entitled “Agricultural cooperatives in the Kyrgyz Republic” was also prepared and disseminated.

3.2 Pilot test of proposed methods for developing know-how dissemination tools on water and land productivity improvement, and guidelines and manuals in WUAs and Basin Organizations

3.2a Creating 3 to 5 demonstration plots for know-how application.

In each province, irrigation water use and agricultural operation monitoring was conducted, using advanced technologies developed under the project on demonstration plots established in 2002. In order to observe the sustainability of recommended measures since 2005 to 2007, 4 out of 10 demonstration plots were retained.

Irrigation water use on demonstration plots

The analysis of data on irrigation water use in the demonstration plots allows for the assessment of the sustainability of the recommended approaches developed under the project over the period 2002-2004. The monitoring conducted indicated that the unit water delivery is practically within the values obtained as a result of project irrigation measures. Some declines or increases in water delivery (See Figure 3.1) indicate that farmers have begun to pay attention to influencing factors such as land status and weather conditions during a year and to consider them when planning watering events.

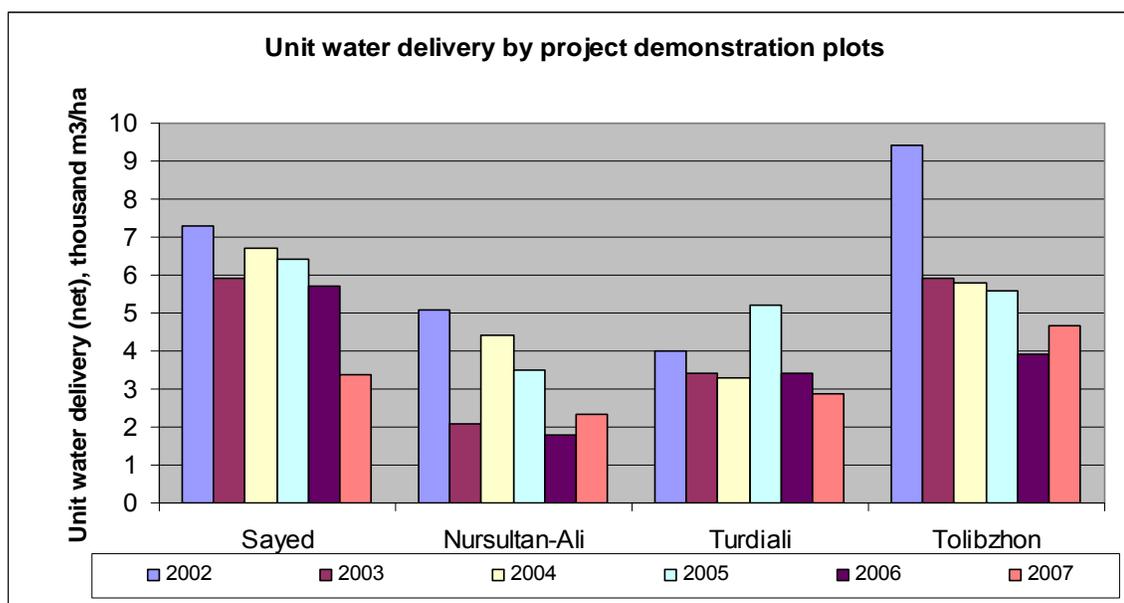


Figure 3.1 *Dynamics of unit water delivery by project demonstration plot*

Evaluation of irrigation water productivity on project demonstration plots

All the demonstration plots since 2002 to 2007 show sustainability of indicators on crop productivity achieved through project decisions and measures. Improvement of water productivity for cotton since 2002 to 2007 was achieved through the efficient use of irrigation water, taking into account soil-reclamation conditions, and high yields of raw cotton (wheat - in Nursultanaly) obtained through agricultural operations developed by the project (Table 3.3).

Table 3.3 Evaluation of water productivity on project demonstration plots

| Farm | Unit withdrawal (gross), thousand m3/ha | | | | | | Yields, t/ha | | | | | | Water productivity, t/thousand m3 | | | | | |
|-------------------|---|------|------|------|------|------|--------------|------|------|------|------|------|-----------------------------------|------|------|------|------|------|
| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
| Sayed | 7,3 | 5,9 | 6,7 | 6,4 | 5,7 | | 2,8 | 2,9 | 2,99 | 3,4 | 3,1 | | 0,37 | 0,49 | 0,45 | 0,53 | 0,53 | |
| Nursultan (wheat) | 5,1 | 2,1* | 4,4 | 3,5 | 1,80 | 2,4 | 2,4 | 4,3* | 4,3 | 4,0 | 4,2 | 3,57 | 0,48 | 2,0* | 0,98 | 1,14 | 2,08 | 1,49 |
| Turdiali | 4 | 3,4 | 3,3 | 5,2 | 3,40 | 2,9 | 3,5 | 3,9 | 4,6 | 4,4 | 4,6 | 4,48 | 0,88 | 1,14 | 1,4 | 0,84 | 1,28 | 1,54 |
| Tolibjon | 9,4 | 5,9 | 5,8 | 5,6 | 3,90 | 4,7 | 3,7 | 3,6 | 3,7 | 4,2 | 3,9 | 4,1 | 0,4 | 0,61 | 0,71 | 0,75 | 1,0 | 0,87 |

*) It is necessary to note that irrigation rates were less in 2003 with account of precipitations - It means that in future irrigation norm should be revised accordingly.

An impact of agricultural production management and water use efficiency in demonstration fields over the period 2002-2007 can be observed in Figure 3.2.

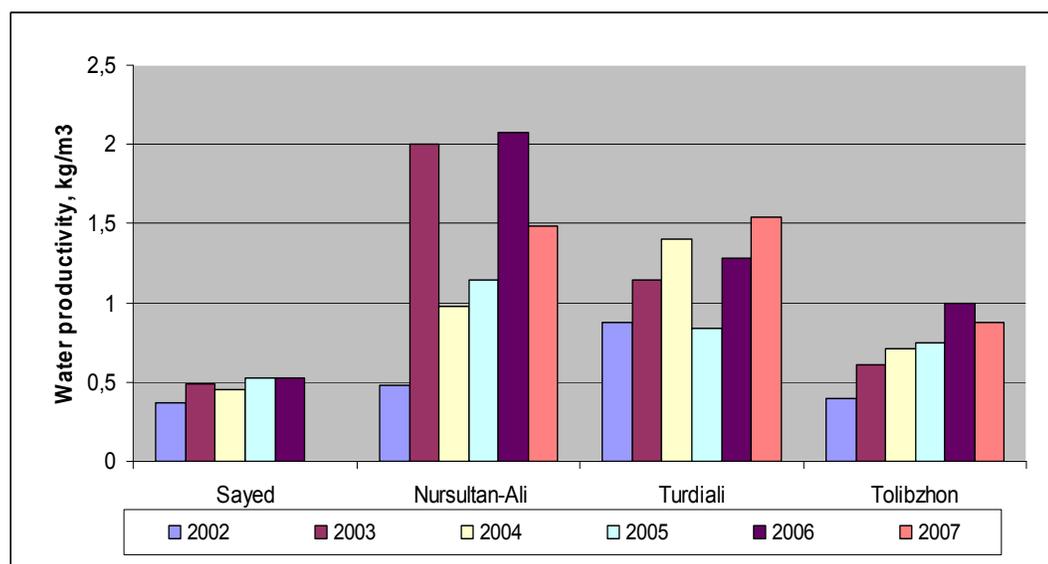


Figure 3.2 Water productivity in project demonstration plots

Evaluation of irrigation water productivity and efficiency in rayon polygons (2005-2007)

In order to disseminate advanced technologies and accumulated project experiences, in 2005 pilot rayon polygons were established in Fergana and Andijan provinces, Uzbekistan to apply and demonstrate state-of-the-art technologies and methods and ways to improve land and water productivities. Dynamics of irrigation water productivity and inputs in the rayon polygons over the period of 2005 - 2007 shows a considerable improvement of these indicators both in most rayon sites and in the provinces as a whole.

Rayon indicators of water productivity averaged for Andijan province increased by 31% for cotton as compared 2005 (i.e. increased from 0.44 kg/m³ to 0.58 kg/m³). As for cereal crops, those indicators of irrigation water productivity and inputs over the period of 2005-2007 increased: 0.86 kg/m³ (2005) - 0.97 kg/m³ (2006r.) - 0.92 kg/m³ (2007) (Figure 3.3).

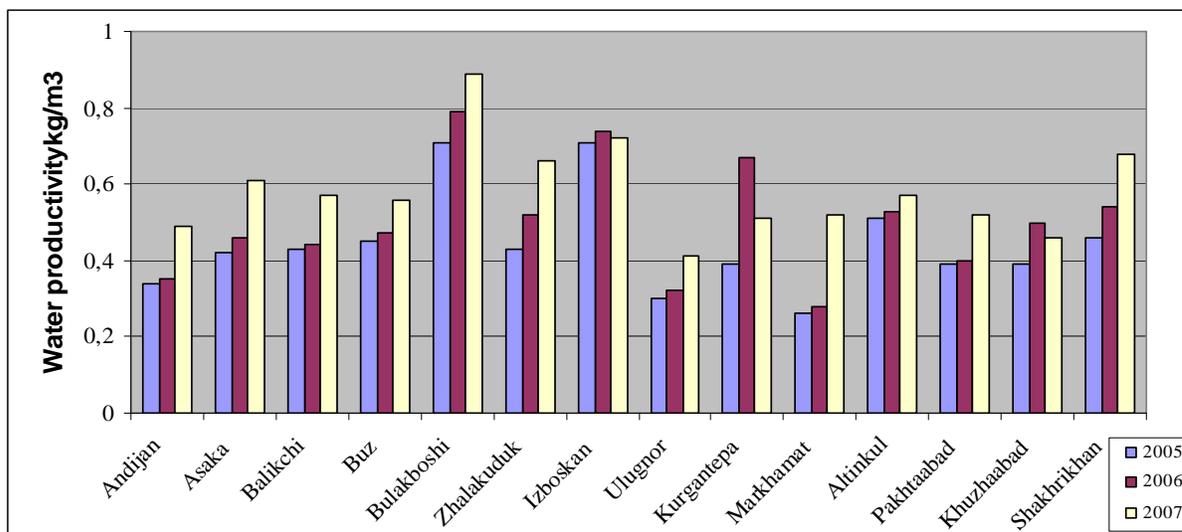


Figure 3.3. Irrigation water productivity for cotton in polygons of Andijan province

Fergana valley also shows a tendency towards increasing water productivity, however, growth rate of this indicator for cotton is slightly lower and equals 16% from that of 2005 (i.e. the following growth over 2005 - 2007: 0.53 kg/m³ - 0.60 kg/m³ - 0.62 kg/m³) (Figure 3.4).

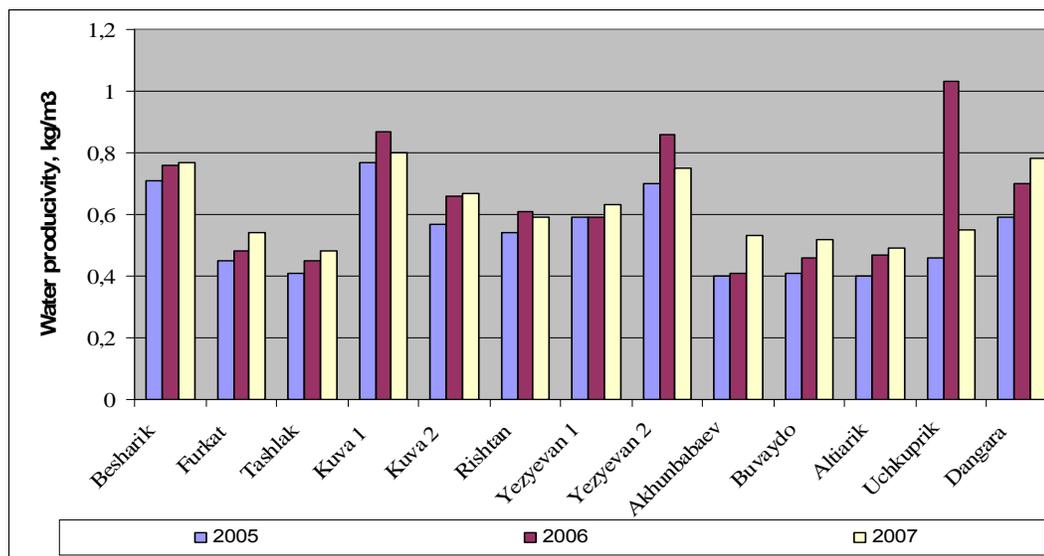


Figure 3.4 Irrigation water productivity for cotton in polygons of Fergana province

Evaluation of costs and profit in rayon polygons of Andijan province

Agro-economic indicators for rayon polygons permitted the evaluation of given agricultural production effectiveness as a whole and the analysis of the dynamics of particular elements in terms of prices. Net profit was more than 2 times higher in 9 farms and did not change significantly in 2 farms. Profit was below starting levels in 3 farms in 2007 (Figure 3.5).

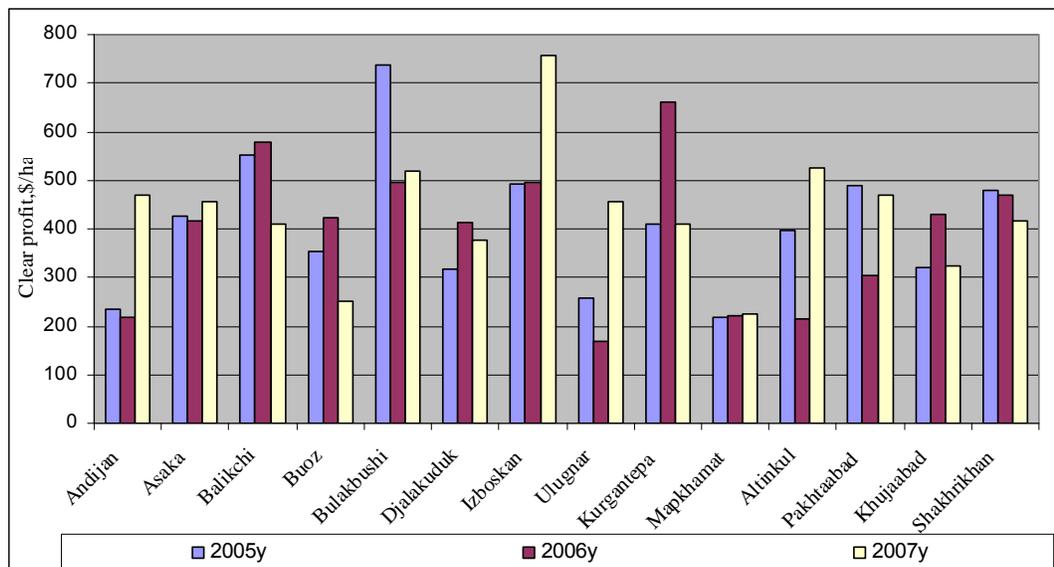


Figure 3.5. Evaluation of net profit for cotton in polygons of Andijan province for 2005-2007

The cost ratio for production of agricultural crops and gained profit is of special interest. If cost and profit variation is analyzed over the last few years, it can be seen that cotton production costs have increased almost by 2 times in 2007. Cost and profit dynamics for period 2005-2007 shows a tendency towards annual cost increase, while profit against costs do not follow this tendency - a high degree of variability. Price increases for resources are not in line with the price received for agricultural products and therefore affects total farm profit. Specific result of analysis is not profit for different crops - cotton even on the managed farms deviated around 400\$/ha, garden - 650 - 850 \$/ha, grapes - 1300 - 1600\$/ha. It permits the introduction of a differential price for water service (Figure 3.6).

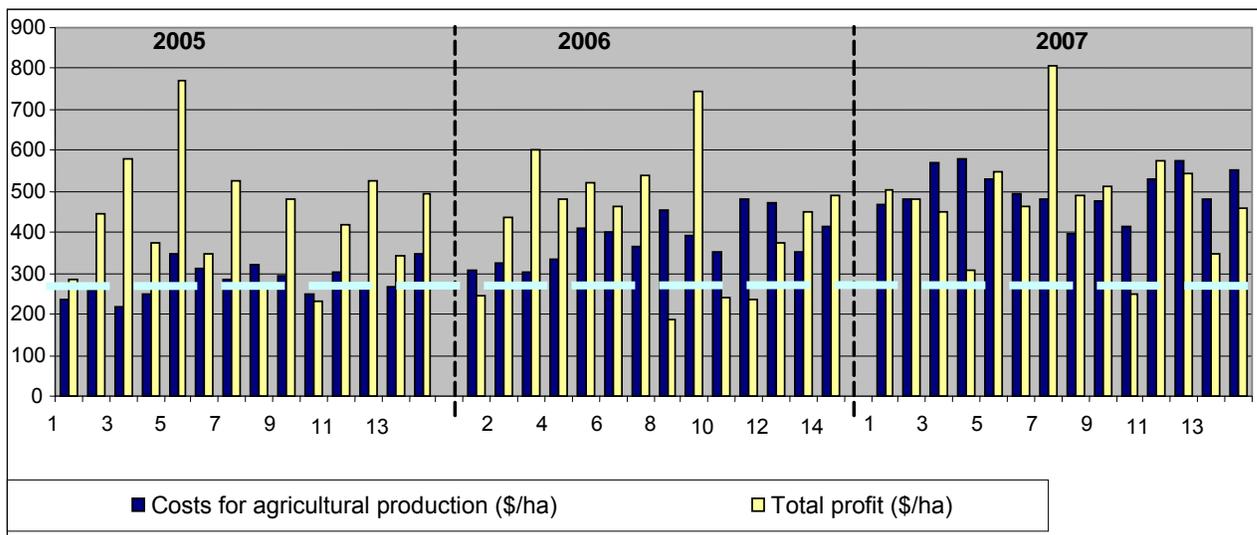


Figure 3.6 Evaluation of cost and profit in polygons of Andijan province

3.2b Training of trainers and water managers

There are four SMID staff working at the WUA level in the three pilot areas. Their major tasks included: (i) identification of major land-water related problems of local farmers; (ii) getting in contact with existing consultancy/extension groups (Government/NGO); (iii) conducting field days and fairs for dissemination of IWRM Ferghana project results. In particular, these trainings were held for Rural Advisory Service (RAS), NAU and Polygon consultants at the IWRM-FV project training centres. They were trained in the following disciplines: best on-farm water use practices, water conservation methods based on world and local experiences such as contour, alternate and discrete irrigation. Moreover, recommendations were developed as to where in the Ferghana valley the above-mentioned methods can be applied. Overall, 7 RAS consultants in Kyrgyzstan, 20 NAU and CECI extension service consultants in Tajikistan and 30 polygon technicians in Uzbekistan were trained on how to establish WUGs on tertiary canals and advantages in solving water distribution, ISF payment and water productivity issues. Project also looked for the former employees of Kolхозes and Covхозes, who worked as Agronomist, irrigators, etc specialists and willing to work 'on-call' basis as "freelance consultants". Strategy was to facilitate the local interaction with those experienced people, as immediate measure of extension. The project has:

- Identify the locally recognized, experienced (or even retired) leaders of former kolkhoz, water managers of *rayvodkhoz*es, *kolkhoz* hydrotechnicians, ditch riders, former brigadiers, agronomists, irrigators available within WUA or nearby with consent of WUA;
- Train and equip the local consultants on water management concepts that are promoted under IWRM principles (hydrographic, demand oriented, participatory, user oriented, simple rotational mechanisms, bottom up WUA concept; role of water users in the governance, WUG concept);
- Linking them as local consultants with existing WUAs in the project area and making a "consultants resource pool" available for need based extension for WUA specialists, farmers, water users, WUG leaders and water managers on request. He or she will be available to the WUA members on a fee base individual (private farms) or group consultations;
- Facilitation of informal and nominal payment mechanisms at the affordable level of water users such as in kind from the harvest, collection of some fees, labor help etc.;
- WUA/WUGs will organize and coordinate the service and payment - a nominal payment mentioned above and collected from the beneficiaries for case by case (not a full time and salary based employment);

The role of the project in this case was periodical process monitoring, constant follow up and methodological back up from project side provided through the members of SMID team. See the list of such consultant already available in Tab. 3.4.

Table 3.4 List of 'freelance consultants' trained

| | Name | Background | Province |
|----|-------------------------|------------------------|----------|
| 1 | Pirimkulov Dustmuhammad | Hydro-technician | Sogd |
| 2 | Holov Bahriddin | Hydro - technician | Sogd |
| 3 | Islomov Abdullajon | Hydro - technician | Sogd |
| 4 | Azamov Bahrom | Hydro-technician | Sogd |
| 5 | Mahmadov Mergan | economist | Sogd |
| 6 | Samatov Abdumalik | Hydro-technician | Sogd |
| 7 | Majiev Tadjibay | Mechanical engineering | Osh |
| 8 | Atahanov Mamir | agronomy | Osh |
| 9 | Tursunov Halidjan | Agronomy | Osh |
| 10 | Karabaev Tashlanbay | Agronomy | Osh |
| 11 | Pattahunov Hasanbay | Mechanical engineering | Osh |
| 12 | Tajibaev Rustam | Engineer Technology | Osh |
| 13 | Turdibaev Shavkatbek | Veterinary | Osh |
| 14 | Hurbaev Nizom | Agronomy | Osh |
| 15 | Kayiberdiev Begali | Worked as brigadir | Osh |

| | Name | Background | Province |
|----|----------------------|------------------------------------|----------|
| 16 | Abduraimova Laylohan | Agronomy | Osh |
| 17 | Kyrgyzboev Bahodir | Agronomy | Andijan |
| 18 | Norboev Kamoliddin | Agronomy | Andijan |
| 19 | Boymirzaev Golibjon | Agronomy | Andijan |
| 20 | Holiqov Abdusalom | Agronomy | Andijan |
| 21 | Valiev Toyir | Hydro-technician | Ferghana |
| 22 | Kuchkarov Hasanbay | Agronomy | Ferghana |
| 23 | Madaliev Urinbay | Agronomy | Ferghana |
| 24 | Mahammatov Ahmadjan | Agronomy | Ferghana |
| 25 | Madaliev Askarali | Agronomy | Ferghana |
| 26 | Movlanov Muydin | Agronomy | Ferghana |
| 27 | Tillaev Akram | Agronomy | Ferghana |
| 28 | Maksudov Nasriddin | Agronomy | Ferghana |
| 29 | Isaev Hamroqul | Former chairman of collective farm | Ferghana |
| 30 | Ahmedov Rahmat | Agronomy | Ferghana |
| 31 | Usmonov Karim | Agronomy | Ferghana |
| 32 | Nizamov Muhammadjan | Hydro-technician | Ferghana |
| 33 | Gulmirzaev Saydullo | Agronomy | Ferghana |
| 34 | Shokirov Ermat | Agronomy | Ferghana |
| 35 | Mahmudov Mukum | Agronomy | Ferghana |
| 36 | Tuychiev Bahodir | Agronomy | Ferghana |

3.3 Establish links with RAS/FOMP and other relevant projects / national agencies for uptake and use of guidelines and manuals

Generalized knowledge on productivity improvements were disseminated through effective partnerships with extension services. For this purpose, partnership links have been established with local extension services such as Rural Advisory Service in Osh, NAU in Khodjent and Agricultural Research Polygons under the MAWR of Uzbekistan in the Ferghana and Andijan Provinces. Project staff have trained consultants of those organizations in best water management practices, conservation and improving productivity of water use. These consultants are expected to disseminate project technologies over a large number of farmers, organizations and agencies.

During the period 2005-2007, the project established links and signed collaboration agreements with: ASDP-NAU (Agency Support Development Process NAU) and CECl in Sogd province; RAS and Tes Center in Osh province. Training themes and dates were agreed with directors of these organizations. During the last three years, the project has supported existing extension services through training their specialist as well as giving practical consultations to farms (Table 3.5).

Table 3.5 IWRM-Ferghana project coverage of farms through training of trainers from extension services

| Name of provinces and extension services | Number of trainers and farmers | Number of farms embraced by trainers | Covered area, ha | | Total ha |
|--|--------------------------------|--------------------------------------|------------------------------|-----------------------------|--------------|
| | | | Through trainers and farmers | Through khakimiyats and MTP | |
| Sogd province | | | | | |
| ASDP-NAU and CECI | 20 | 76 | 8564 | | 8564 |
| Farms | 300* | 300* | 3000* | | 3000* |
| Ferghana province | | | | | |
| BAIS and WUA Akbarabad | 16 | 240 | 2400 | 3000 | 5400 |
| Farms | 600* | 600* | 32457* | | 32457* |
| Andijan province | | | | | |
| BAIS and shirkat farm Bulakboshi | 14 | 210 | 2100 | 3000 | 5100 |
| Farms | 800* | 800* | 30218* | | 30218* |
| Osh province | | | | | |
| RAS | 7 | 200 | 2000 | | 2000 |
| Total | 57 | 726 | 80739 | 6000 | 86739 |

* taking into account forthcoming training workshops among farmers in Sogd, Ferghana and Andijan provinces.

Result 4: Support to national level water management policy improvements / changes

To support the political initiatives at the national level, in the creation of a legal, political and enabling climate for IWRM including legal structures for WUA, canal governance with public participation, functional inter-ministerial groups were established by the project. They were effective in realization and furthering the project goals in States that allowed the transfer of project results for further strategic decision-making, facilitating inter-sectoral dialogues taking into account local conditions for their wider dissemination at the country level. A set of policy recommendations were developed for those who make policy decisions, the key aspects and tools were conveyed for further discussions. The comments and proposals from NCSG were received and the feedbacks from policy makers were instrumental in fine-tuning the project activities.

4.1 Establish a functional IWRM National Coordination and Support Group (NCSG) in each of the three states to facilitate policy uptake of lessons/ methodologies and organize regular roundtables on important IWRM issues with other stakeholders including NGOs

The project has proposed a new composition of NCSGs. the ministries concern of all three countries have identified and approved membership nominations to NSCGs. Thus, NCSGs were composed of representatives from interested ministries and departments (Ministry of Finance/Economics, Ecology, Agriculture, Justice, etc). On a regular basis, NCSGs meetings and Round Tables with participation of stakeholders were conducted.

4.2 Organize training, experience sharing workshops, study tours and exchange visits on IWRM for senior policy levels

A successful Study Tour to Turkey for 11 participants (key stakeholders) was organized in 2006. The main goal of the tour was to study Turkish experience in IMT. Study tour participants visited DSI's regional offices, irrigation development projects at various river basins, irrigation cooperatives, municipalities, village authorities and Water Users Associations.

In 2007, a study tour to Israel was organized for the decision makers in Tajikistan and Kyrgyzstan to learn experiences of effective water management in that country.

The project experience was presented during the course "Water resources use management and conserving technologies" in Israel. The ICWC, MIA of Israel, Centre for International Cooperation MASHAV and Centre for International Cooperation on Agricultural Development CINADCO were instrumental in organizing this course.

A regional exhibition and knowledge fair titled Integrated Water Resources Management in Central Asia was held in 2007 in Osh City. The main goal of the event was to invite a range of partners and share with them the IWRM Ferghana experiences, exchange ideas, learn from each other, and establish communication and sustainable cooperation. The Fair consisted of two main parts:

- Exhibition of results, presentation of positive experiences, proven technologies of effective water use and conservation and sharing the knowledge through story telling;
- Group discussions organized along the following four main aspects:
 - a) Implementation of IWRM at the national level, e.g. creation of enabling political and legal environment to promote changes;
 - b) Governance and participation for better water resources management;
 - c) Issues concerning WUA formation and development in Central Asia; and
 - d) Role of extension services and their sustainability for better exchange, replication and dissemination of positive experiences in water and agricultural sectors

Three additional aspects important to IWRM were suggested by the fair participants and incorporated in the discussion process. These included:

- Improving gender awareness among water sector stakeholders and the role of women participation in achieving IWRM goals;
- Knowledge Sharing Initiative in Research suggested by ADB's Bright Spots project; The experiences shared by the project included creating opportunities and spaces for the exchange of ideas and challenges through effective farmer learning alliances, establishing community of practices;
- Integration of existing irrigation systems with trans-boundary small rivers, the issues on adoption of IWRM principles and establishment of the participatory bodies (commissions) to manage small river sources

Each section presented the results of the group discussions in the plenary session where the government officials, international organizations, water managers and farmers acknowledged the importance of IWRM in current water situations in Central Asia.

4.3. Prepare and disseminate guidelines for senior water managers and information brochures, leaflets, maintaining website pages, newspaper articles for increasing public awareness

The project hired a PR consultant to plan, structure and implement a public awareness campaign on IWRM. This consultant was tasked with the followings:

- Development of the PR strategy in the light of project goals and objectives and through a review of important project materials and reports by each component,
- Holding meetings and interviews with project staff and key stakeholders, undertaking field visits;
- Stratification of key stakeholders by major target audiences (along the lines of national to local policy and decision making, sectoral interests; provincial, basin level organizations, canal

- organizations, WUAs, farming organizations, local communities, authorities and other social networks etc.);
- Selection of the mass media (national, local, provincial) to target the audiences on IWRM principles;
 - Drafting and agreeing with project staff and among partners the content and concepts of future outputs;

With support of projects technical expertise, consultant has produced and disseminated a range of materials among the stakeholders. Figure 4.1 indicates the range of awareness creation materials produced in terms of relative quantities. For the list of different documents produced, please see Annexures.

4.4 Transition to full management by CMOs/CWCs at pilot canals by the end of project phase

The project’s irrigation management transfer (IMT) experience was initiated in Kyrgyzstan where all preconditions for successful IMT process existed. For this to happen, the project tried to strengthen provincial and district level public sector bodies through effective SMID and awareness building activities, as well as facilitate the beneficiary farmers and water user associations in Osh Province to bring about the right conditions for effective transition towards joint management arrangements between the government and community of water users. Specific guidelines were prepared, disseminated and applied to this end using participatory approaches (involving public, private sector and civil society) in planning, designing, constructing, operating, and maintaining water infrastructure and strengthening water users association. During the execution, the project’s implementation approach evolved from being driven by technical support and assistance, to facilitation, integration and participation. The transfer process too, has evolved to be more gradual and results-oriented. It has been successful in pioneering important institutional changes along with building required capacities for innovative and effective water management.

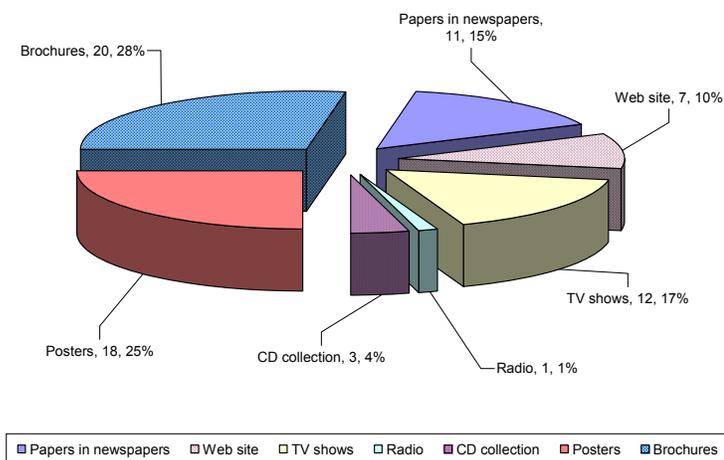


Figure 4.1 Information about materials published

This activity was first initiated in Kyrgyzstan, where several consensus-building meetings were conducted with the involvement of National Coordinators and regular updates of NCSG on the development. The other countries were expected to start the process later. Two draft versions of Agreement on Joint Canal Governance between regional basin organization and the Union of Canal Water Users were prepared for discussions and feedback from a range of stakeholders to work out the final document. For this purpose in 2005, the project developed a 10-Step IMT Methodology and Action Plan for the Pilot Aravan-Akbura Canal (Osh Province, Kyrgyzstan). This later evolved into a conceptual framework endorsed by all relevant stakeholders along two pilot canals, AAC and KBC, for transferring management functions to joint canal governance. The first consensus building meeting was conducted in September 2005 to create a “critical mass” among the key stakeholders. In 2006, this resulted in the

signing of the first IMT agreement between canal water users and the state with the latter transferring governance functions over the Aravan Akbura CMO to a joint management body. The joint management agreement for AAC was signed between the Osh Basin Water Management Organization (BWMO) and the UWU of AAC in March, 2006.

Later, based on the Kyrgyz experience, the project facilitated a similar IMT process in Tajikistan where in May, 2007 the joint management agreement was signed between the Ministry of Amelioration and Water Resources of Tajikistan and the UWU of KBC. Similar arrangements were later discussed and agreed between the UCWU of SFC and the 'Central Unified Operations Control Center for the Ferghana Valley Main Canals' (serving Andijan, Namangan and Fergana Provinces) in Uzbekistan. Currently the signed agreement is with NCSG of Uzbekistan, pending final approval from the Ministry of Agriculture and Water Resources.

4.5 Adoption and Up-scaling of IWRM Financial mechanisms at national levels

The project developed a number of innovative, user-friendly and simple tools for effective management of participatory water user organizations, which were shared with the respective NCSG in each project country. One of such tools is an organizational self-assessment methodology for governors, managers and members to assess and improve the performance of their new canal organizations. The benefits of such self-assessment tools are expected to include consideration of stakeholders' needs in decision making, strategy development for better performance, better accountability, monitoring of organizational investments. In addition, the key advantage of such self-assessment is a joint participatory approach that encourages continuous learning about organizations. This tool is designed for UWU and CWC. Currently it is under internal review and once agreed upon will be shared with other stakeholders for their comments and recommendations.

Another tool is a business-planning guide for WUAs, CMOs and UWUs. The project has also made available a tool for WUAs to help assess the performance of their irrigation service. WUA is an organization of water users and as such is meant to satisfy the needs of water users and be fully accountable to them. To fulfill these obligations, WUA leadership needs to have tools to monitor the quality of their services. Particularly WUA must know to which extent water is managed effectively, how fairly it is distributed, how the infrastructure is maintained and are there sufficient funds to run such services. Normally, WUA managers each year report to the annual General Assembly meeting on the activities carried out in the last year and seek approval for the next year plans. Such reports are by far and largely technocratic often failing to reflect the real situation. With this in mind a simple and user-friendly tool has been developed to make such assessments are more user-friendly.

The purpose of the tool is to help WUAs in assessing their irrigation service performance and use the findings to identify problem areas and take actions for continuous improvement. Two tools were developed to this end: one is meant for WUA directorate and another for WUA's governing body - WUA Council.

4.6 Adoption and Up-scaling of IWRM operational management mechanisms at national levels

The NCSG experts of the Republic of Kyrgyzstan, have approved the proposal to disseminate experience of AAC to right bank canals namely, to "Uvam" UWUA and "Ak-Suu" UWUA.

The strategy of water sector development where all aspects of Integrated Water Resources Management are taken into account was developed by the order #121 on 26.06.2006 of the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan. NCSG members have actively participated in this strategy development named as "About the strategy of water sector development of Tajikistan".

The NCSG experts of the Republic of Tajikistan rendered assistance in the elaboration of draft legislation "About WUA" and developed contributions and changes containing elements of IWRM principles implementation for the Water Code of the Republic of Tajikistan.

A workshop on “Elaboration of IWRM National Plan in the Republic of Tajikistan” was conducted together with **Scientific Production Association of Tadjik Research Institute of Hydrophization and Melioration** on 28-29.04.06. A workshop on Establishing WUA supported by the department at the Ministry and in provinces and districts of the Republic was conducted with the participation of the Ministry on 12.04.06.

The NCSG experts of the Republic of Uzbekistan reviewed the following recommendations and manuals, prepared within the framework of the project and recommended to the MAWR. Ministry has approved them for implementation:

- “Guidelines on canal operation”;
- “Recommendations on drainage water use for irrigation”;
- “Manual on planning and executing repair-and-rehabilitation operations in WUA”;
- “Recommendations on safe use of collector- drainage water for irrigation”;
- “Manual on reclamation problems resolving in WUA”;

The NCSG experts participated in elaboration of the “Law about WUA” project, concerning comments, contributions and basic provisions on transition to paid water use in the Republic of Uzbekistan. More than 400 people - chiefs and experts of different levels participated in 4 regional seminars in Tashkent, Khorezm, Ferghana and Bukhara provinces. The experience of establishing WUA was successfully disseminated and advantages of organization on the hydrographic principle were proved. The ZEF project realizing the implementation of Integrated Water Resources Management in Khoresm has agreed to adapt our approaches on MIS introduction by the example of the selected Kulavat canal in the Tashsaka system.

4.7 Technical Upgrading at national level

The implementation of IWRM in the Fergana Valley has a large innovative character not only on institutional aspects, but also in many technical subjects that were presented broadly in many workshops organized by the project. Beside, presentations were made on many interstate and even international conferences. Among these innovations are:

- system of indicators for integrated performance, efficiency of irrigation network;
- interface (typical) for DB of IWRM;
- algorithm and software of MIS for planning and monitoring of water allocation among water users at the level of canal;
- the same at the level of WUAs;
- improvement to the model CROPWAT, taking into account the influence of groundwater and the creation of new software for definition of water demands;
- methodic and practical implementation of assessment of change of hydromodule zoning with output to the water demands.

4.8 IWRM development for new objects including canal, WUA and Farm level

In accordance with decision of the PSC as of February 2006, the project in May 2006 jointly with Kyrgyz NCSG and Osh Basin Water Management organization ran stakeholder consultations. A series of meetings held suggested the need for replication of the IWRM experiences in the left bank side of the Akbura River to the Right Bank Canal system. The project and the stakeholders stressed the importance to up-scale its results to a basin scale. In June, the project for the purpose of dissemination of the project results held an introductory seminar on “IWRM experience along AAC and its implications to the Right Bank Canal”. The representatives of the Karasu and Aravan District WMOs, the Left Bank Canal (AAC) and RBC system (Uvam, Yakkalik and Yujny) specialists and 3 representatives of the Osh Agricultural Institute participated in this event.

Result 5: Sustainable water resources management of transboundary small rivers - Shakhimardan and Khodja-Bakirgan

This component was not in the original project document, but initiated in 2007. The river Shakhimardan flows from Kyrgyzstan part of Ferghana valley to Uzbekistan and the Khodja-Bakirgan River from the Tajik part of the valley to Uzbekistan. It was proposed that under IWRM Fergana project these two small river based irrigation systems will adopt IWRM concepts and establish transboundary water commissions based on 'joint agreements' to supervise the sharing of water resources. If successful water sharing commissions could be established, this could serve as precedence for a further 11 small rivers draining into the Ferghana valley that are trans-boundary.

The project has approached the problem from two angles i.e. from a top-down as well as bottom-up approach. Project staff worked closely with local irrigation management authorities to collect current practices, hydrological and water distribution data, and existing water sharing procedures and conflicts. Further a team focussing on SMID worked with water users, creating awareness and mobilizing them to improve water management at farm and WUA levels. The project has proposed drafts of bi-lateral agreements on establishing a river commission with description of their duties and responsibilities. To introduce IWRM, the initial hydrographical analysis was carried out along with inventory of key stakeholders. WUAs within the pilot basins have been trained using pilot canal/ WUA experiences, and the first WUGs were established in selected WUAs. A key component in this activity was the SMID campaign that was initiated at the start of the activity. With respect to technical aspects, based on general hydrological assessments, key points were identified for flow monitoring purposes.

5.1 Investigate the status of water allocation procedures and prepare a legal framework for Transboundary Small Rivers (TSR) water allocation

Analysis on water availability was conducted using collected hydrologic and irrigation systems information and maps of the area. Hydrographical boundaries were identified for each local WUA zone. These boundaries were compared with the actual situation and with the water distribution situation within the WUAs. The analysis was also instrumental in making an inventory of key stakeholders. Most of them were WUAs that as primary water users represent an institutional base for their participation in water management.

Most of the current water management practices originated during the Soviet Union era and have continued to date. This management approach was a significant contributing factor for growing conflicts as new conditions and expectations have emerged that are different to those of the past and are mainly focused on countries themselves and not on the region as a whole. Existing agreements on TSR water sharing and International agreements were analyzed to develop a new legal framework for these changed conditions in these small rivers. Based on these analyses a draft legal document was prepared and discussed with local authorities. Local authorities were convinced that this could help to solve their day-to-day problems.

5.2 Preparing conditions for creating organizational structures for TSR water resources management

a) Mobilizing main stakeholders for supporting proposals for improvement of Shakhimardan and Khodja-Bakirgan TSR water resources management

The Project hired and trained new staff for SMID activities in all three countries for TSR areas. Some had valuable NGO experiences in dealing with transboundary issues. The Project has used the IWRM experiences (WMO, WUA, WUG,), to improve water management in TSRs areas as well as involve local communities and water users.

The key activities included facilitation of bottom up and hydrographic WUAs in the zone of TSRs, with the objective of establishing a single system management unit (SMU), responsible for the TSR system (river + canals) and over the longterm to establish a Union of System Water Users (USU) and Joint Management (USU+WMO) for the system.

For the Tajik part of the Khodja-Bakirgan River the concept used by the project included:

- Strengthening of existing WUAs by establishing WUGs and training them on WM aspects in line with IWRM concepts;
- SMID in non-dismantled large farms - IWRM concepts (hydrographic principle, user participation)
- Inviting people concerned to seminars and trainings held along the pilot canal KBC;
- Facilitating their participation in UWU of KBC and improving links between WUAs of TSR and KBC;
- Facilitating internal water management in line with IWRM principles (informal WUA and WUG models)
- In the case of facilitating a bottom-up process to establish WUAs this included the forming of initiative groups, SMID in local *jamoats*, *khukumats*, and assembly meetings, registration documents.

For the Uzbek part of Shakhimardan TSR:

- Reorganization of administrative WUAs into hydrographic;
- SMID inside administrative WUAs;
- Involving Isfayram-Shakhimardan ISA in reorganization;
- Establishing WUGs in problematic areas;

For the Kyrgyz part of both Shakhimardan and Khodja-Bakirgan TSRs:

- Establishing WUGs (involving WUAs and monitoring, participation of WUGs in WUA councils, formalizing WUGs);
- Facilitating WUAs to make technical improvements through user involvement (WUG initiative);

SMID teams in the following areas supported all WUAs along TSRs:

- Basic documentation related to water (water accounting journals, system inventory, water use plans etc);
- Support in establishing informal networks of WUA leaders;
- Training on business planning for WUAs

b) Developing proposals for establishing Commissions on Shakhimardan and Khodja-Bakirgan TSR water resources sharing comprising representatives from key stakeholders

There were several meetings and workshops conducted together with irrigation authorities of local areas to discuss issues, problems and solutions. They were also, appraised on the existing legal documents and proposed drafts. Detail issues were discussed at the meeting held in the local agencies as well as in project training centers. Proposed draft is available with component progress report. However, SDC has indicated that it may not be appropriate to accelerate the establishing of river coordination commissions, etc but to discuss the draft further with other relevant decision makers.

5.3. Capacity building of main coordination commissions and monitoring the process

River coordination commissions as such were not established. However, the following seminars were conducted along TSRs with the involvement of key stakeholders, water users and SMID teams:

- On-the-job training for hydrotechnicians and WUG leaders based on 5 modules (crop needs, water accounting, water planning, distribution, performance assessment);
- Application of social and technical performance indicators;
- Simple and user friendly irrigation basics and concepts;
- Time-based water distribution for WUAs;
- WUA sustainability through establishing effective WUGs;

As in pilot canal areas, the Project has pursued a bottom-up approach. It was important to build the capacities of water users to begin with, as the approach was to create a dialogue between parties across the borders. Such dialogues are easier when both parties have the same understanding of issues and solutions.

a) Raising awareness and disseminating experience

Public awareness building among water users and local communities for effective water management was initiated. However, due to sensitivity of the areas - near border, these dissemination activities were low key and were difficult and slow. Materials developed under IWRM Ferghana were shared with many water users and irrigation officials.

IV. Capacity building and training activities

A wide range of stakeholder capacity building efforts was carried out during this project period. They include seminars, trainings on various aspects of IWRM, consultations and PR campaigns based on key dissemination issues. These were aimed at promoting IWRM principles and targeted at a whole range of stakeholders, organizations and local communities using various communication channels such as planning and training workshops, focus group discussions, local mass media (TV shows, radio, newspapers), various publications (guidelines and brochures on business planning, water distribution, water allocation, water accounting, water conservation, etc.), posters and policy briefs in local languages. All these were geared for up-scaling and propagation of IWRM principles over the broader territories in the Ferghana Valley countries both within and beyond the project areas, including the key provinces - Andijan and Ferghana in Uzbekistan, Sogd Province in Tajikistan and Osh Province in Kyrgyzstan. Through the NSCG to national ministries and departments concerned with water in all three project countries. Table IV.1 presents details of these different capacity building efforts, implemented during Phase III of the project.

Table 4.1 Capacity building activities for Phase III

| | Subject | Date | Target group | Number of people |
|-----|---|---------|--|------------------|
| 1. | Training on Implementation of rotational time based water distribution | 05/2005 | WUAs along PCs, water users, WUG leaders | 98 |
| 2. | SMID team building and planning workshop | 06/2005 | Selected SMID team members, key stakeholders | 20 |
| 3. | Dialogue meetings with AAC stakeholders on IMT options | 07/2005 | Osh BWMO, WUAs along AAC, industry, ecology, water supply | 46 |
| 4. | Training of WUA leaders on Water Management in South Kazakhstan | 07/2005 | Representatives of WUA support, directors and hydrotechnicians of the Agricultural Cooperatives of Water Users | 28 |
| 5. | Institutional, legal, financial aspects of WUA establishment | 08/2005 | Shirkats, non-dismantled farms, pilot WUA experts, administrative WUA representatives | 231 |
| 6. | Conflict resolution in newly established WUAs | 08/2005 | Shirkats, non-dismantled farms, pilot WUA experts, administrative WUA representatives | 226 |
| 7. | WUA irrigation network operation and maintenance | 09/2005 | WUA technical specialists, experiences ditch-riders, mirabs | 187 |
| 8. | First roundtable meeting on transfer options and agreement on establishing joint governing body for AAC | 09/2005 | SDC, Osh BWMO, other sectors, WUAs, stakeholders from UZ, TJ | 122 |
| 9. | Role of new institutions and irrigation management transfer at main canals | 10/2005 | SFC and KBC stakeholders, WUAs, non-agricultural water users | 106 |
| 10. | Training workshops on WUA performance assessment basics | 10/2005 | WUAs along pilot canals, active water users, WUG leaders | 213 |
| 11. | Improving water and land productivity in the field scale | 11/2005 | WUG leaders, former brigadiers, WUA hydrotechnicians, mirabs, experienced farmers | 347 |
| 12. | Water distribution planning, monitoring and evaluation | 01/2006 | New WUA leaders, shirkat, cooperative and other large farm representatives | 144 |
| 13. | 3 trainings on WUA Development Strategy for SMID teams for entire SFC, KBC, AAC | 02/2006 | Whole SMID team including 2 new people from Andijan part of SFC | 22 |
| 14. | Training of trainers on WUA Water Management ¹ | 04/2006 | Experienced hydrotechnicians among SMID team members | 10 |

¹ 5 modules on Crop Water Requirements, Water Use planning at WUA level, Water Distribution amongst member farmers, Water measurement, Assessment of Water Management Performance of WUA

| | Subject | Date | Target group | Number of people |
|-----|--|--------------------|---|------------------|
| 15. | 3 Trainings in South Kazakhstan and Turkmenistan on IWRM Ferghana results on WUA level by the invitation from Counterpart (USAID) WUA support program | 05/2006 | Representatives of WUA support unit in the Southern Regional Water Department, directors and hydrotechnicians of the Agricultural Cooperatives of Water Users | 42 |
| 16. | 3 trainings on increasing water and land productivity through best practices and water conservation | 05/2006 | WUG leaders, former brigadiers, WUA hydrotechnicians, mirabs, experienced farmers | 83 |
| 17. | Trainings on WUA business planning for pilot WUAs | 07/2006 | Specialists of pilot WUAs (directorates, accountants, hydrotechnicians, council members) | 58 |
| 18. | Seminar on supplemental irrigation and water harvesting | 09/2006 | Training consultants of local extension services (RAS, polygons, APPR Nau) | 34 |
| 19. | Seminar on SMID experience on establishing affective water user groups | 10/2006 | Specialists of Ras, NAU, MAWR Polygons | 23 |
| 20. | Seminar with MAWR of Uzbekistan (NCSG) on Water pricing perspectives in WUAs | 10/2006 | Specialists from MAWR, BISAs, SFC | 83 |
| 21. | Study tour and experience sharing workshop for local colleges and technical schools | 11/2006 | Faculty members and students from Osh Agrarian Institute, Tajik Technical University (Khodjent Branch) and Markhamat HM College in Andijan | 94 |
| 22. | National Roundtable on Transfer of KBC governance to a Joint Management - creation of critical mass, discuss transfer options and agreement | 12/2006 | Representatives from Ministry, Sogd PWD, UCWU, WUAs, Industrial cooperatives and farmers | 87 |
| 23. | Training for WUAs on water distribution performance assessment tools | 12/2006 | More than 40 WUAs participated, non dismantled big farms, cooperatives | 138 |
| 24. | 2 consensus (awareness) building workshops amongst key stakeholders for SFC and KBC on UCWU representation concept and Joint Management | 02/2007 | Provincial WDs, WUAs along PCs, industry, ecology, water supply, farmers | 62 |
| 25. | National roundtable for Uzbekistan to discuss IMT options for SFC | 10/2007 | Key stakeholders | 30 |
| 26. | Business planning trainings for canal organizations | 06/2007 | CMO staff | 30 |
| 27. | 3 roundtables on alternative water allocation at canal level for AAC, SFC and KBC | 09/2007 | CMO and BWMO staff | 30 |
| 28. | 3 trainings are conducted on IWRM principles (Water allocation and performance monitoring) | 07/2007 | Specialists of Technical Colleges | 10 |
| 29. | Training the trainers on WUA Business Planning (finance and asset management) tools for pilot WUAs | 09/2007 | Field consultants, pilot WUA managers, specialists of WUAs along TSRs | 18 |
| 30. | 3 Trainings for WUA councils to assess the water distribution performance of their WUA directorates | 11/2007 | Training the trainers (SMID team) to provide training for PCs and TSRs | 22 |
| 31. | Calculating water allocation indices and operative planning at pilot canals using MIS tools | 08/2005 | Experts of SFMC and AAC Authorities and Syrdarya-Sokh BISA | 13 |
| 32. | Discussing the concept of transferring activity control authority to Aravan Akbura Canal Authority | 09/2005 | SDC, Osh BWO Authority (BWOA), Pilot Canal Authorities chiefs, UWU and WUA chairmen, other stakeholders | 45 |
| 33. | Water allocation planning and analysis using MIS tools | 04/2006 | Experts of PC, Syrdarya-Sokh BISA and Osh BWOA | 18 |
| 34. | Water allocation planning and analysis using MIS tools | 06/2006 | CMO experts, CMO low level employees | 27 |
| 35. | Perfection of SFMC water resources management | 06/2006 | CMO experts, CMO low level employees | 80 |
| 36. | Perfection of main canal water resources management involving all stakeholders (local authorities, agriculture, industry, ecology, drinking water supply etc.) in the taking decisions process | 07/2006 | IWMI, regional project executives, WUA representatives in the AAC zone and all stakeholders | 35 |
| 37. | Perfection of KhBC water resources management | 07/2006 | CMO experts, CMO low level workers | 37 |
| 38. | Training on increasing water accounting reliability and accuracy | 08/2006 | Pilot Canal experts Pilot Canal experts | 16 |
| 39. | Problems of establishing legislative basis to involve the public in the water allocation management process | 10/2006 | NCSG, Ministry of Justice of the Republic of Uzbekistan, regional project executives | 17 |
| 40. | Water allocation monitoring and assessment | 12/2006 | CMO experts, UWU representatives, IWMI mobilizers, regional project executives | 32 |
| 41. | Perfection of water allocation monitoring and assessment using MIS tools (4 workshops-trainings) | 04/2007 | Experts of CMO and its hydrosites, WMO, WUA and UWU representatives | 171 |
| 42. | Experience and problems of water resources management in main canals and transboundary small rivers in the Fergana Valley | 08/2007 | Experts of CMO and its hydrosites, WMO, WUA and UWU representatives | 40 |
| 43. | Perfection of operative planning water allocation using MIS tools (3 workshops-trainings) | 09/2007 10/2007 | Experts of CMO and its hydrosites, WMO, WUA and UWU representatives | 114 |
| 44. | Experience and problems of the public participation in water resources management in pilot canals (2 workshops) | 12/2007 | Representatives of BAIS, WUA and farms, UWU | 100 |

| | Subject | Date | Target group | Number of people |
|-----|---|---------|---|------------------|
| 45. | Experience and problems of water users' participation in water resources management in South-Fergana Main Canal ¹ | 12/2007 | Farmers, chiefs of farms and WUA representatives in the SFMC zone and workers of 10 hydrosites | 373 |
| 46. | Perfection of operative planning water allocation using MIS tools | 02/2008 | Experts of CMO and its hydrosites, representatives of BAIS and WUA | 42 |
| 47. | Experience and problems of water users' participation in water resources management in AAC | 04/2008 | WUA representatives in the AAC zone and employees of Osh BWOA and AAC Authority | 47 |
| 48. | Water use plan development methodology. Transfer from ten-day to daily water allocation among water users. | 06/2005 | WUAs along PCs, water users, WUG leaders, farmers | 137 |
| 49. | Water accounting organization in WUA (location and selection of water meters, procedures for constructions, attestation and certification of water meters, water measuring system organization) | 08/2005 | WUAs along PCs, water users, hydrometers, farmers, WUG leaders | 131 |
| 50. | Principal institutional, legal and financial and economic measures for WUA establishing and functioning. Water allocation in WUA based on user request. | 09/2005 | WUAs along PCs, WUG leaders, water users, hydrometers | 213 |
| 51. | Principal institutional, legal and financial and economic measures for sustainable WUA functioning. Water use in WUA | 02/2006 | WUAs along PCs, WUG leaders, hydrometers, water users | 190 |
| 52. | Water resources management perfection at the WUA level. | 04/2006 | WUAs along PCs, WUG leaders, water users, farmers, hydrometers | 186 |
| 53. | Water accounting organization and water use monitoring in WUA. | 06/2006 | WUAs along PCs, WUG leaders, water users, farmers, hydrometers | 179 |
| 54. | Drawing up business-plans and plans of repair-and-rehabilitation operations in WUA, established along SFC, KBC and AAC. | 11/2006 | WUAs along PCs, WUG leaders, water users | 166 |
| 55. | Water resources management perfection at the WUA level. | 04/2007 | WUG leaders, water users, hydrometers, farmers | 216 |
| 56. | Water accounting organization and water use monitoring in WUA. | 06/2007 | WUG leaders, water users, hydrometers, farmers | 221 |
| 57. | Issues of land reclamation and safe collector-drainage water use in WUA. | 08/2007 | WUG leaders, water users, hydrometers, farmers | 228 |
| 58. | Drawing up business-plans and plans of repair-and-renewal operations in WUA, established along SFC, KBC and AAC. | 12/2007 | WUG leaders, water users | 177 |
| 59. | About cooperation and joint work of IWRM-FV and RAS Projects | 07/2005 | For RAS consultants, regional hydrometers | 25 |
| 60. | Effective irrigation water use and executing agro-engineering operations. Water accounting organization and execution in farms, disease and pest control methods. Legal issues | 08/2005 | For regional water users | 204 |
| 61. | Crop irrigation regime. Water accounting organization in farms. Irrigation technology scheme | 11/2005 | For regional water users | 15 |
| 62. | Crop irrigation water requirements. Water accounting. Agro-engineering measures during winter and spring period. | 01/2006 | For regional hydrometers of Andijan and Fergana regions | 50 |
| 63. | Demonstration sites selecting, organizing and monitoring | 02/2006 | For regional hydrometers of Andijan and Fergana regions | 80 |
| 64. | Cooperation between IWRM-FV and ASDP-NAU | 04/2006 | For ASDP-NAU consultants | 30 |
| 65. | Water accounting in farms | 04/2006 | For ASDP-NAU consultants | 22 |
| 66. | Irrigation regime and crop irrigation water requirements | 04/2006 | For ASDP-NAU, Osh-RAS consultants and regional hydrometers of Andijan and Fergana regions | 92 |
| 67. | Agro-engineering measures and irrigation technology scheme | 04/2006 | For Agricultural Extension Services consultants and regional hydrometers of Andijan and Fergana regions | 70 |
| 68. | Practical trainings in installation water meters | 05/2006 | For ASDP-NAU consultants and regional hydrometers of Andijan region | 48 |
| 69. | Monitoring over farms, agro-economic assessment | 07/2006 | For CECI consultants | 15 |
| 70. | Monitoring over farms, agro-economic assessment and field passportization | 08/2006 | For regional hydrometers of Andijan and Fergana regions | 53 |
| 71. | Experience exchange between extension services of Kirgizstan (RAS) and Uzbekistan BISA and IWRM-FV Project | 11/2006 | For ASDP-NAU, Osh-RAS, CECI consultants and regional hydrometers of Andijan and Fergana regions | 77 |
| 72. | Planning agricultural and irrigation operations. Land and irrigation network preparation for vegetation | 04/2007 | For ASDP-NAU, Osh-RAS, CECI consultants and regional hydrometers of Andijan and Fergana regions | 134 |
| 73. | Crop irrigation water requirements. Water accounting. | 05/2007 | For CECI and TES-Centre consultants | 52 |

| | Subject | Date | Target group | Number of people |
|-----|--|---------|--|------------------|
| | Agro-engineering measures during winter and spring period | | | |
| 74. | Demonstration sites organizing and monitoring | 05/2007 | For regional hydrometers of Andijan region | 20 |
| 75. | Demonstration sites organizing and monitoring | 06/2007 | For regional hydrometers of Fergana region, Osh-Agricultural Extension Services consultants and regional hydrometers of Andijan region | 55 |
| 76. | Demonstration sites organizing and monitoring | 07/2007 | For ASDP-NAU and CECI | 18 |
| 77. | Introductory workshop | 05/2007 | Chiefs of WMOAs of regional and district levels, leaders of components, IWMI workers | 28 |
| 78. | Round tables (dialogs) on the issue of establishing Public Council of Water Management Organizations in small rivers and main canals in Osh and Batken provinces of the Republic of Kyrgyzstan | 07/2007 | Osh and Batken BWOAs, TSR regional executives, chiefs of DWMA (District Water Organization Authority), coordinators of district WUA support departments, UWU representatives | 35 |
| 79. | Workshop - meeting on the theme: "Experience and problems of water resources management in main canals and transboundary small rivers of the Fergana Valley" | 08/2007 | Subdivision chiefs and workers of Syrdarya-Sokh and Naryn-Karadajya BISAs, Authority of SFMC and AAC, AAC and SFC UWU, Osh BWO | 41 |
| 80. | Current workshops | 09/2007 | Officers and workers of state WMO and public water resources management bodies | 53 |
| 81. | Workshop on the theme: "International and national water right in the context of using transboundary water resources" | 09/2007 | Representatives of Osh and Batken BWOA, Sogd WMOA, Main Canals System Management Organizations, UCWU | 58 |
| 82. | Current workshops in the framework of events of Swiss Monitoring Mission | 10/2007 | Representatives of SDC, Kadamj DWOA and WUA, Fergana district WMO, key executives of the component of Kyrgyz and Uzbek parts of TSR | 50 |
| 83. | Current workshop on work results of Swiss Monitoring Mission | 10/2007 | Chiefs and key executives of all components of "IWRM-Fergana" - pilot canals, WUA, NCSG, below WUA, TSR | 33 |
| 84. | Current workshop | 11/2007 | Representatives of water management and nature conservation organizations of basin, regional and district levels and "Yakhshi niyat" and "Akhroir Mirob Mumin" WUAs, chairman of "Makhallya" Fond, local government bodies - "Vodil" and "Yukori Vodil" rural citizens gatherings of Fergana district | 75 |
| 85. | Bilateral workshop | 11/2007 | Water workers, representatives of district Authorities and local communities, regional executives from three republics | 56 |
| 86. | Trilateral workshop | 03/2008 | Chiefs of the Project NCSGs from Kyrgyzstan and Uzbekistan, chief of Kadamj DWMA of Batken BWOA, coordinator of the project responsible for Sogd province, chairman of Khoja-Bakirgan UCWU, first chief assistant of Main Canals Systems Authority of the Fergana Valley, chairman of South Fergana UCWU | 21 |
| 87. | Goals and objectives of NCSG of the Republic of Tajikistan in Phase III of "IWRM-Fergana" Project | 08/2005 | SDC Regional Manager, the Project Director from IWMI and ICWC SIC, leaders of the following activities: Pilot Canals, WUA, below WUA, officers and workers of state WMO and public water management bodies of Tajikistan | 35 |
| 88. | Goals and objectives of NCSG in Phase III of "IWRM-Ferghana" Project | 10/2005 | SDC Regional Manager, the Project Director from IWMI and ICWC SIC, leaders of the following activities: Pilot Canals, WUA, below WUA, officers and workers of state WMO and public water management bodies of Tajikistan, Kyrgyzstan and Uzbekistan | 30 |
| 89. | Principal institutional, legal and financial and economic measures for WUA establishing and functioning. | 11/2005 | Representatives of ICWC SIC, IWMI, NCSG and leaders of Andijan, Namangan, Syrdarya, Kashkadarya, Surkhandarya and Navoi provinces | 34 |
| 90. | Goals and objectives of NCSG of the Republic of Kyrgyzstan in Phase III of "IWRM-Fergana" Project | 12/2005 | SDC Regional Manager, the Project Director from IWMI and ICWC SIC, leaders of the | 36 |

| | Subject | Date | Target group | Number of people |
|------|---|---------|--|------------------|
| | | | following activities: Pilot Canals, WUA, below WUA, officers and workers of state WMO and public water management bodies of Kyrgyzstan | |
| 91. | Round tables on the theme: "Issue of co-management involving the community of pilot AAC" | 02/2006 | Chiefs of BWOA, responsible people of Water Management Department, representatives of Bishkek and Tashkent SDC offices | 35 |
| 92. | Elaboration of the National plan of IWRM in the Republic of Tajikistan | 04/2006 | Representatives of Tajik Hydrology and Land Reclamation Research Institute, officers and workers of state WMO and public water management bodies of Tajikistan | 42 |
| 93. | Round tables on the theme: "Issue of intersectoral interconnections on water use, role of National Water Council and other bodies established in accordance with Water Code of the Republic of Kyrgyzstan" | 04/2006 | Officers and workers of state WMO and public water management bodies | 58 |
| 94. | Pubic participation in water resources management, issues of standardization of hydroposts and its affect on water accounting, problems resolving of water and land resources in the conditions of transferring to IWMR | 07/2006 | Representatives of water organizations, public water management bodies, hydrometers and hydrotechnicians | 50 |
| 95. | Implementing and disseminating of operative management tools at national level with the participation of IWMI | 09/2006 | Representatives of water organizations, public water management bodies | 40 |
| 96. | Water accounting and its management, contractual relations at water use and implementing market principles in water use | 12/2006 | Farmers, WUA chiefs, representatives of Irrigation Systems Organizations, organizations of pumping stations, energy and communication, representatives of BISA | 78 |
| 97. | Qualitative autumn-winter irrigation and melioration works executing, preparing hydrotechnical constructions and hydroposts, facilitating internal water management network and also perfection of WUA functioning | 12/2006 | Officers and workers of WMO, WUA directors, chairmen of farms, hydrometers and hydrotechnicians | 130 |
| 98. | Qualitative autumn-winter irrigation and melioration works executing, preparing hydrotechnical constructions and hydroposts, facilitating internal water management network and also perfection of WUA functioning | 01/2007 | WUA director, chairmen of farms, hydrometers and hydrotechnicians, representatives of BISA | 131 |
| 99. | Economic water resources use and their effective management | 06/2007 | Chiefs and experts of Amu-Bukhar BISA, chiefs of district agriculture and water management departments of Bukhara province, chiefs of WUA and farms, experts of MAWR of the Republic of Uzbekistan, chiefs of "Suvnazorat" regional water inspectorate | 100 |
| 100. | Workshop: "Perfection of water management in main canals by involving all stakeholders (local authorities, agriculture, industry, ecology, drinking water supply etc.) in the problems resolving process" | 07/2006 | Representatives of BWMO and DWMO, representatives of Water Management Councils, WUA, project representatives | 49 |
| 101. | The second national workshop of the Republic of Uzbekistan | 10/2006 | Chiefs and experts of ministries and departments of the Republic of Uzbekistan and non-governmental organizations and representatives of international organizations and projects | 31 |
| 102. | Round table on discussing the transferring to joint management of SFC Authority | 05/2007 | NCSG Members, chairman of SFC Water Users' Council, chairmen of the Council of SFC Andijan and Fergana hydrosites, representatives of BWOA and DWOA, representatives of khokimiyats | 33 |
| 103. | Round table on the theme: "Establishing water management councils for small rivers - together with "On-farm irrigation" project" | 06/2007 | Representatives of BWOA and DWOA, representatives of Water Management Councils, Batken province WUA, project representatives | 24 |
| 104. | Round table on the theme: "Establishing water management councils for small rivers - together with "Internal irrigation" project" | 06/2007 | Representatives of BWOA and DWOA, representatives of Water Management Councils, Osh province WUA, project representatives | 28 |
| 105. | Main result of "IWRM-Fergana" Project implementation in the Republic of Tajikistan | 07/2007 | Officers and workers of state WMO and public water management bodies in Tajikistan | 48 |
| 106. | Disseminating the experience of "IWRM-Ferghana" | 08/2007 | Representatives of the WUA support | 25 |

| | Subject | Date | Target group | Number of people |
|------|---|---------|---|------------------|
| | Project | | department of the Ministry, WMO representatives, WUA directors | |
| 107. | Round table on discussing the IWRM implementation in Uzbekistan | 04/2008 | Members of NCSG, ICWC SIC, Central Asian Irrigation Research Institute, representatives of IFAS GEF Agency, Water Problems Institute, Ferghana and Andijan provinces project coordinators, regional executives, journalists | 31 |
| | Total | | | 8473 |

¹ Workshops conducted in SFMC hydro sites on the grant of American Embassy

Apart from short meetings and discussions, altogether 107 formal seminar/workshops were conducted targeting 8473 individuals. Obviously, due to different nature of the subject tackled and focused on certain geographical area, an individual may have attended more than one such event.

V. Resources and management

Project management

During Phase III, the cooperation between the implementing partners has improved significantly. At the beginning of each year, partners have held annual planning meetings of project activities by each component for better cooperation, coordination and consensus building. The consortium has also held on a monthly basis regular progress review meetings with their respective component leaders reporting on progress and discussing any issues faced during the respective month and any corrective actions needed. The minutes of each such meeting were widely shared between the partners and other key stakeholders for better communication. This has helped to make field operations and joint actions to be more cohesive and effective. This also, resulted in a better exchange of information and better understanding between the partners.

SDC monitoring was carried out on a quarterly basis (every three months). In each quarter, SDC Water portfolio manager from Tashkent, independently made field visits to the project sites to review /monitor progress on the ground. Back to office reports of these reviews were helpful in making corrective actions.

The project would like to acknowledge the role of the SDC Consultant Mr. Juerg Kraehenbuehl, who played a key role in the strategic steering of activities. His overall impact on the project results achieved to date is significant. The mission reports prepared by the SDC Consultant have always been resourceful in fine-tuning the project activities, providing a different angle and helping to take corrective measures whenever necessary.

In September 2007, SDC contracted a group of independent consultants to do an external review (ER) of the project progress. The External Review team provided an overall positive feedback on the achievements of the project and recommended another phase to consolidate and prepare for the dissemination of the achievements. ER team has identified a few areas for further improvement in the next phase of the project. The report prepared by the ER team provided a strategic view and future perspective directions for the project. The project team appreciates the hard work, style and professionalism shown by the ER team, given the short time available for them.

Personnel and Staff

Information about the IWMI employed regional staff involved in the project is presented in the Table 5.1. The Table 5.2 below provides a list of SIC employed regional staff in the project. In line with the recommendations of the Annual Meeting held in January 22, 2006 in Ferghana, IWMI in 2006 hired a PR consultant - Dr. Konstantin Mosin, to plan, structure and implement a public awareness campaign to promote the main achievements of the project. The consultant successfully developed and implemented the required public awareness activities ensuring at the same time that all topics and themes proposed for the campaign are relevant, beneficial to and accepted by all the stakeholders for further wider dissemination among the public at large. IWMI also hired another consultant - Dr. Alisher Tashmatov to develop policy briefs for major lessons learned from the project. He has the responsibility of writing up all lessons learnt in short briefs for policy makers in Central Asia.

Table 5.1 *IWMI employed regional staff*

| | <u>Name</u> | <u>Designation</u> |
|----|----------------------------|---|
| 1 | Herath Manthirithilake | Project Co-Director (E) ² |
| 2 | Asad Qureshi | Researcher (E) |
| 3 | Hugh Turrall | Researcher (E) |
| 4 | Mark Giordano | Researcher (E) |
| 5 | Iskandar Abdullaev | WM Specialist (L) ³ |
| 6 | Akmal Karimov | Soil and Water Expert (L) |
| 7 | Jusipbek Kazbekov | WM Specialist (L) |
| 8 | Alexandr Platonov | GIS/RS Specialist (L) |
| 9 | Gunchinmaa Tumor | Socio-Economist (E) |
| 10 | Kakhramon Jumabaev | Field Office Head (L) |
| 11 | Nargiza Nizamedinkhodjaeva | Socio-Economist (L) |
| 12 | Murat Yakubov | Sociologist/Interpreter (L) |
| 13 | Oytur Anarbekov | Business Planning/Livelihood Specialist (L) |
| 14 | Diloram Sabirova | Secretary (L) |
| 15 | Ilhom Babaev | Accountant (L) |
| 16 | Konstantin Mosin | PR specialist (C) ⁴ |
| 17 | Alisher Tashmatov | Policy Brief Consultant (C) |
| 18 | Boris Mirzaev | TSR team consultant (C) |

² E – International expert

³ L – local expert

⁴ C - consultant

Table 5.2 SIC ICWC employed regional staff

| | Name | Designation |
|----|-------------------------|---|
| 1 | Dukhovny Victor | Project Co-Director |
| 2 | Sokolov Vadim | Regional Project Manager |
| 3 | Mirzaev Nazyr | Activity Leader of Pilot Canals (PC) |
| 4 | Pinkhasov Mier | Activity Leader of WUA |
| 5 | Horst Mikhail | Activity Leader (from 01.01.2008) of WUA |
| 6 | Mukhamedzhanov Shukhrat | Activity Leader of Below WUA |
| 7 | Rysbekov Yusup | Activity Leader of Small Rivers (TSR) |
| 8 | Mukhina Lyudmila | Project accountant |
| 9 | Galustyan Aurika | Logistic |
| 10 | Masumov Rustam | Consultant on water account (PC, WUA) |
| 11 | Ibragimov Iso | Consultant on water account |
| 12 | Rasulov Ubaydulla | Consultant on water account |
| 13 | Srazhitdinov Ravshan | Consultant on pumping stations |
| 14 | Abzalov Bakhtier | Consultant on pumping stations |
| 15 | Stulina Galina | Consultant on hydromodule zoning (PC, WUA) |
| 16 | Yakubov Khalidar | Consultant on land reclamation (WUA) |
| 17 | Umarov Pulat | Consultant on land reclamation (WUA) |
| 18 | Ziganshina Dinara | Legal Consultant (WUA) |
| 19 | Ruziev Iskander | Consultant on ecology (SR) |
| 20 | Varnakova Valentina | Secretary-register |
| 21 | Stepanov Vitaliy | Driver |
| 22 | Artemev Nikolay | Communication engineer |
| 23 | Obidina Svetlana | Cashier |
| 24 | Zhuravleva Irina | Secretary |
| 25 | Kim Olga | Translator |
| 26 | Saidov Rustam | Activity Assistant (PC) |
| 27 | Ergashev Ikrom | Regional Technician (PC) |
| 28 | Tuchin Alexandr | Database Expert (PC) |
| 29 | Kats Anatoliy | Regional DB programmer (PC) |
| 30 | Zhereleva Svetlana | Specialist on GIS (PC, WUA) |
| 31 | Solodkiy Georgiy | DB Programmer (PC, WUA) |
| 32 | Alimdzhanov Akhmad | Activity Assistant (WUA) |
| 33 | Abasova Dzhamilya | Regional Technician (WUA) |
| 34 | Muradov Elbek | Technician on water distribution (01.01 - 02.05.2007) |
| 35 | Usmanov Shavkat | Technician on water distribution (c 01.06.2007) |
| 36 | Ruziev Islom | Activity Assistant (DIT) |
| 37 | Nerozin Sergey | Agronomist (DIT) |
| 38 | Mukhamedzhanov Azamat | Technician |
| 39 | Tillaev Bakhtiyar | Activity Assistant (TSR) |
| 40 | Umirzakov Gulomzhon | Technican-cameralist (TSR) |
| 41 | Buranov Farkhad | Legal consultant (TSR) |

SMID Team

In 2005, IWMI formed a fully functional, experienced and skilled SMID team that consisted of 20 people (5 in Tajikistan, 6 in Kyrgyzstan and 9 in Uzbekistan). Each country team had its country coordinator, who ensured that all the activities were undertaken on time, that there is strategic links established between the components and all field activities are coordinated with provincial coordinators and SIC teams. IWMI provided the SMID teams with intense and comprehensive training on the following subjects:

- organizational aspects of team work;
- communication and mobilization skills;
- social mobilization and institutional development;
- adult learning and organization of participatory trainings;
- process documentation and reporting
- IWRM, project concepts and specific objectives of IWRM FV project.

After an intensive team building exercises, the project regional staff facilitated SMID teams to develop team and individual plans. Organization of field activities in this manner proved effective in dissemination of project results to a much wider audience and organization of successful SMID activities.

In 2006, IWMI hired two additional SMID members for Andijan part of the SFC (as recommended by the stakeholders at the annual meeting in January 26-27, 2006). Therefore, the number of SMID team staff reached 22 people. In April 2006, the team was given a thorough orientation and training before they started field operations. Team members were tasked to report monthly on the progress made and their impact has been regularly monitored. The new staff were selected in a competitive selection process in consultation with and the involvement of local water management authorities.

In April 2007, IWMI built a new SMID team for TSR component where an additional 5 people were hired (see Table V.3). Mr. Mirzaev Boris was hired as a TSR consultant and team coordinator for organization of SMID activities at a regional scale.

Table V.3 Social mobilization and institutional development teams by countries

| Kyrgyz SMID Team | | | |
|-------------------------|--------------------------|---|--------------------------|
| | Consultant's Name | Project Activity | Project Component |
| 1 | Isroiljon Soibjonov | Facilitation of Joint Council of AAC and IMT concept (Field Team Coordinator) | Pilot Canal |
| 2 | Abdraev Kubanchbek | Strengthening of CMO and UCWU relation | |
| 3 | Kamilov Janibek | WUA strengthening (Organizational management Improvement) | WUA Level |
| 4 | Yuldashev Azatdil | Strengthening of WUA Councils through representation of WUGs | |
| 5 | Sadirov Akilbek | WUA strengthening (Water management improvement), along Shakhimardansay transboundary small river (Kadamjay District) | TSR |
| 6 | Jalilov Salimjan | WUA strengthening (Water management improvement) along Khodja-Bakirgan transboundary small river (Leylek district) | |
| 7 | Gazibaev Kasimjan | Water productivity improvement through effective WUGs | Below WUA |
| 8 | Nurmatov Nurlan | Development of WUGs in problematic zones | |

Tajik SMID Team

| | Consultant's Name | Project Activity | Project Component |
|---|------------------------|---|-------------------|
| 1 | Khujamatov Abdulkhamid | Hydrographic composition of potential WUAs by hydrounits of KBC | Canal Level |
| 2 | Ashurov Khamid | WUA strengthening (Organizational management Improvement) | |
| 3 | Karimov Salimjon | WUA Water management improvement (Water use plans) | WUA Level |
| 4 | Saidakhmadov Mamurjon | SMID activities on WUA establishment (Field Team Coordinator) | |
| 5 | Kobilov Farhod | WUA strengthening (Water management improvement) along Khodja-Bakirgan transboundary small river (Bobojon Gafurov district) | TSR |
| 6 | Asakolov Ashur | Water productivity improvement through effective WUGs and farmer networks | Below WUA |

Uzbek SMID team

| | Consultant's Name | Project Activity | Project Component |
|----|----------------------|--|-------------------|
| 1 | Bakirov Mirkomil | Agreeing WUA composition map with UCWU and CMO of SFC | Canal level |
| 2 | Baratov Nematjon | Implementation of WUA development strategy with appropriate CMO/UCWU representatives and stakeholders along hydrounits | |
| 3 | Rustamov Islom | Hydrographic composition and reorganization of potential WUAs by hydrounits of SFC, Andijan part | |
| 4 | Babaev Nuriddin | SMID activities on WUA establishment (ground work) in Andijan part of SFC | WUA Level |
| 5 | Norkuziev Tavakkal | Hydrographic composition of potential WUAs by hydrounits | |
| 6 | Akhunjanov Rasuljon | SMID activities on WUA establishment or reorganization of administrative ones to hydrographic (ground work) | |
| 7 | Yunusov Nuriddin | WUA Strengthening - Organizational Structure Improvement plus Activation of WUA councils | |
| 8 | Rajabov Akrom | WUA Strengthening - Water Management Improvement (Training on Water Use Plan, Water Distribution, Measuring, | |
| 9 | Dadaboev Shermirza | WUA strengthening (Water management improvement) along Shakhimardansay transboundary small river (Ferghana District) | TSR |
| 10 | Abdullaev Nemat | Establishing WUGs in problematic zones (Field Team Coordinator) | Below WUA |
| 11 | Abdusamatov Sodikjon | Establishing WUGs in problematic zones | |

Expenditures

Table 5.4 Summary budget of planned and actual expenditures of IWMI for Phase III (2005-2008)

| Budget heads | 2005 | | 2006 | | 2007-2008 | | Total | |
|------------------------------------|---------|---------|--------|---------|-----------|---------|---------|---------|
| | plan | actual | plan | actual | Plan | actual | plan | actual |
| Personnel | 132 900 | 106 028 | 241850 | 215 903 | 339 900 | 348 396 | 714 650 | 670 327 |
| Supplies and services (works) | 15 000 | 5 397 | 26 900 | 17 436 | 46 700 | 46 535 | 88 600 | 69 367 |
| Travels (local and international) | 21 502 | 22 689 | 32 470 | 36 148 | 64 600 | 59 727 | 118 572 | 118 564 |
| Trainings and seminars /SMID | 36 500 | 7 179 | 59 500 | 57 727 | 96 100 | 100 170 | 192 100 | 165 077 |
| Transport, equipment and furniture | 7 500 | 1 375 | 20 500 | 3 711 | 18 000 | 6 070 | 46 000 | 11 156 |
| Publications and dissemination | 3 000 | 827 | 5 000 | 4 688 | 30 000 | 15 037 | 38 000 | 20 551 |

| | | | | | | | | |
|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|
| Collaborative activities | 6 000 | - | 9 000 | - | 20 000 | 1 200 | 35 000 | 1 200 |
| Total direct costs | 222 402 | 143 495 | 395 220 | 335 612 | 615 300 | 577 135 | 1 232 922 | 1 056 242 |
| Indirect costs * | 40 032 | 25 829 | 71 140 | 60 410 | 110 754 | 103 884 | 221 926 | 190 124 |
| Total | 262 434 | 169 324 | 466 360 | 396 022 | 726 054 | 681 019 | 1 454 848 | 1 246 365 |

Table 5.5 Summary budget of planned and actual expenditures of SIC for Phase III (2005-2008)

| Budget heads | 2005 | | 2006 | | 2007-2008 | | Total | |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| | plan | actual | plan | actual | Plan | actual | plan | actual |
| Personnel | 155750 | 120598 | 197299 | 177349 | 339910* | 347736 | 637860** | 645683 |
| Supplies and services (works) | 13400 | 15496 | 45700 | 20568 | 74000 | 68886 | 158750 | 104950 |
| Travels (local and international) | 12400 | 20616 | 37100 | 24487 | 93410 | 91156 | 116000 | 136259 |
| Trainings and seminars /SMID | 20100 | 21747 | 61000 | 41171 | 117000 | 120776 | 168700 | 183694 |
| Transport, equipment and furniture | 47300 | 50431 | 20050 | 4851 | 59500 | 59503 | 114840 | 114785 |
| Publications and dissemination | | | | | 15000 | 10000 | | 10000 |
| Total direct costs | 248950 | 228888 | 361149 | 268426 | 690510 | 698057 | 1196150 | 1195371 |
| Indirect costs * | 24895 | 22888 | 36115 | 26843 | 69051 | 69806 | 119615 | 119537 |
| Total | 273845 | 251776 | 397264 | 295269 | 759561 | 767863 | 1315765 | 1314909 |

** taking into account the extra funds for SFMC UWU at the rate of \$ 8310

Annex VI Summary of achieved and un-finished business

Institutional aspects

Hydrographization

Starting situation

Till the project SFMC was under management of the following organizations:

- Big Ferghana Canal Management Organization
- Andijan Provincial Administration for Water Resources;
- Ferghana Provincial Administration for Water Resources.

AAC was under management of the following organizations:

- Aravan District Administration for Water Resources;
- Karasu District Administration for Water Resources.

KhBC was under management of the following organizations:

- B.Gafurov District Administration for Water Resources;
- Dj.Rasulov District Administration for Water Resources.

In Kyrgyzstan WUAs were in place since 1998, but mainly replacing former collective farms and WUAs were administrative.

In Uzbekistan, land reforms to dismantle collective farms and shirkats continued until 2007, giving the lands to farmers. No WUAs were in place till 2003, when pilot WUA Akbarabad was established by the IWRM project.

In Tajikistan, WUA is a recent concept (various donors promoted pilot WUAs since 2003). The reorganization of large collective and cooperative farms is still underway.

What was achieved

1. As a result of project implementation three Canal Management Organizations were created within hydrographic boundaries:
 - South-Ferghana Main Canal Management Organization
 - Aravan Akbura Canal Management Organization
 - Khodja-Bakirgan Canal Management Organization
2. KhBC and AAC were fully transferred to the hydrographical principle.
3. During Phase III considerable steps were made to complete transference to hydrographical principle at SFMC:
 - 40 km of Shakhrikhansay and Margilan and Fayziobod reaches were transferred under control of SFMC MO;
 - 5 pilot WUAs conclude agreements on water supply directly with SFMC MO

What was not achieved

Because the SFMC system is larger and more sophisticated than KhBC and AAC, the hydrographization work at this system still is not completed. Nowadays the concept on SFMC hydrographization completion is being developed taking into account local conditions.

Public Participation

Starting situation

Before the project, the public participation principle was only at the makhalya level and it began to be

introduced at the level of former collective farms (kolkhozs) and state farms (sovkhozs) by creating Water Users Associations (WUA). This process was initiated at main canals level only during the project.

What was achieved

At all three pilot canals:

1. Union of Canal Water Users (UCWU) were created and registered legally:
 - SFMC UCWU;
 - AAC UCWU;
 - KhBC UCWU.
2. Structures (tools) as UCWU Board have been formed and are functioning. UCWU Board meetings (monthly) are held regularly.
3. "Concept on joint governance..." for pilot canals was developed and introduced:
 - "Agreements on joint governance..." for pilot canals were developed, agreed and signed:
 - o Agreement between BAWR and AAC UCWU was signed in Kyrgyzstan;
 - o Agreement between the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan and KhBC UCWU was signed in Tajikistan;
 - o Agreement between FVMCA and SFMC UCWU was signed in Uzbekistan.
 - On the basis of "Agreement on joint governance..." bodies for joint governance have been formed and are functioning: Board of Canal Water Committees (SFMC CWC; AAC CWC; KhBC CWC) composed of representatives from:
 - o Water management organizations (WMO) and
 - o Water users (UCWU).
4. Water-users are involved in water governance process: UCWU water users take part in decision-making on joint water governance at canal level through their representatives in CWC Board.
5. During the growing season, each ten-days CWC Board holds meetings where water distribution along pilot canal for previous ten-days is assessed on the basis of the water distribution indicators and where decisions are made for the next ten-days;
6. Because SFMC is very large (as compared with AAC and KhBC), SFMC UCWU and SFMC WC branches have been created on 10 hydrounits of SFMC to increase effectiveness and efficiency SFMC UCWU and SFMC WC activity;
7. UCWU Councils and CWC Councils are being formed. Representatives from related (non-agricultural) sectors (ecology, drinking water supply, energy) as well as local authorities, women and aksakals are being involved in water governance process through such Councils;
8. "Guideline on organizational improvement of water management" was developed.
9. New funding sources are being searched to ensure UCWU sustainability:
 - Proposal for a tax credit has been submitted (AAC UCWU),
 - Negotiations about financial assistance of \$ 25,000 to water supply purposes are in progress with one of the donor organizations (SFMC UCWU);
 - SFMC UCWU has benefited a grant of the Embassy of the United States of America in the amount of \$ 4,500 to conduct workshops at hydrounit level.

What was not achieved

1. Financial sustainability of UCWU is very low. UCWU members have begun to transfer funds on UCWU bank account only since 2007.
2. Organization of activities of UCWU and CWC Councils is not completed. Participation of the non-agricultural water users is on irregular basis.
3. The links between WUAs and UWUs are weak. It needs improvement.

Legal Framework Improvement

The followings have been developed:

- Recommendations on resolving conflicts and contradictions;
- Recommendations on improvement of acting legislation taking into consideration transference to water use management at large-scale canals on the basis of hydrographical and public

participation principles. Recommendations were discussed at workshops with participation of NCSG representatives from three republics and submitted to interested organizations for discussing and refining.

Technical and technological aspect

Water accounting

1. There were installed new gauging facilities including gauging rods, flow meters for head gauging stations and gauging propellers to meter flow velocity.
2. Flow monitoring tables for flow meters installed at head gauging stations of the pilot canals were adjusted;
3. Technical condition of gauging stations was surveyed. As a result of field surveys data for SFMC gauging stations were specified.
4. Flow characteristics for all balancing, controlling gauging stations of pilot canals and their outlets (selectively) were subjects to processing by statistical methods in order to reveal their correlations and errors.
5. Observations at AAC and KhBC controlling gauging stations are made more often
6. Reliability of flow characteristics for PC controlling gauging stations is verified by sampling measurement of water flows;
7. Trainings are organized for canal hydrometers to train in calibration methods at gauging stations, preparation of flow characteristics $Q = f(H)$ and keeping technical documentation for gauging stations;
8. «Guideline on water accounting for hydrometers of main canals» was prepared

MIS

What was achieved

1. «IWRM-Ferghana» Management Information System was improved and introduced. «MIS-Ferghana» structure is fully maintained by complex of mathematic models and data flow.
2. «MIS-Ferghana» was created because of Data Manager ACCESS and GAMS. At the present time «MIS-Ferghana» version 3.0 was set and tested at pilot canals.
3. «MIS-Ferghana» allow:
 - Accounting actual water withdrawal for outlets and canals;
 - Registering applications for decade water supply;
 - Modeling different options of water distribution between water users under various applications and various water supply volumes;
 - Finding optimal options of water distribution;
 - Analyzing water distribution effectiveness.
4. System of water distribution indicators includes (beside traditional indicators practiced by operating people in water distribution: water availability, efficiency, unit water supply, ...) the following ones:
 - Flow sustainability at controlling gauging stations during a day;
 - Sustainability of average daily water supply during decade;
 - Water supply equitability;
 - Collectability of fees for water services;
 - Others.
5. The followings were prepared and disseminated
 - Guideline on using MIS tools for users to prepare, adjust water distribution plans and calculate water distribution indicators at pilot canals level;
 - Guideline on water distribution monitoring and evaluation;
 - Guideline on pilot canal operation.
6. The followings were organized
 - Systematic input of monitoring results in database (DB);
 - Calculation of decade (total) indicators for water distribution;

- Submission of water distribution indicators to UCWU and CWC for operational (and final) evaluation of water management quality at pilot canals to make decisions for the next decade (season).

What was not achieved

“MIS-Fergana” program needs a range of improvements and eliminating a range of defects taking into account the necessity of the tool development for every day use and operative planning. In this connection, during Phase IV, the interface intended for average user, extremely convenient and understandable for users with appropriate prompts and reminders for prevention of bugs and necessity of programs resetting will be developed. In addition, reference books will be checked thoroughly and accurate coordination of operative planning considering water content of major water sources and distortion of actual climatic data from average long standing ones and sowing of second crops as well.

Water distribution programs were not tested under extreme situations (drought, flood).

Pumping stations (PS)

1. Pumping station operation was analyzed in SFMC area;
2. Proposals for improving pumping station operation and water accounting reliability were prepared.
3. Pumping station operation was regulated on the basis of:
 - a. Optimal schedules for PS operation;
 - b. Specification of command areas;
 - c. Stabilization of energy supply;
 - d. SFC UCWU control.
4. Unit water supply from PS was sharply reduced.

Capacity Building

Workshops and trainings

The followings were improved during workshops and trainings

- Knowledge of water users and other stakeholders in the field of IWRM;
- Awareness of water users regarding water distribution at pilot canals. Awareness raising facilitates to observe equitability principle when managing water.

Promotion

Project achievements were propagated and IWRM ideas were up-scaled regularly through

- Mass media (articles in local and central newspapers, local TV broadcast)
- Documentary «Water. Integrated Resources Management» and others.
- Project web-site.

Project Impact Assessment

What was achieved

As a result of project implementation the followings were achieved at pilot canals:

1. Water distribution related conflicts were sharply reduced or practically stopped between CMO and water users;
2. Collectability of fees for KhBC MO and AAC MO water services was increased;
3. Situation related to water supply to tail water users was mitigated. Now local downstream authorities «have no headache» and water users do not spend nights along canals (when it is their turn to take water) and do not fix tens of padlocks on regulating gates in order to avoid «unauthorized water withdrawal» (theft);
4. Water management quality was improved:
 - Decision making process was simplified and became more efficient;

- Water supply equitability and sustainability was improved;
- Unit water supply was reduced;
- Organizational losses were reduced along canals.

What was not achieved

Economic assessment of project impact was not made (water productivity in PC area).

Note: Tables 6.3-6.5 provide information on finished and un-finished business on WUA development and Table 6.2 presents the list of publications needs to be improved and recommended for further dissemination in phase 4.

(Tables and Diagrams)

1. Project deliverables

Table 6.1 *List of principal deliverables from IWRM Ferghana Project, Phase III*

| No | Title | Task | Date | Responsible | Language |
|-----|---|------------------|------|------------------------------|------------------|
| 1. | The concept of pilot canals joint activity control authority (by the example of AAC Authority) (project) | 1.1 | 2005 | N.N. Mirzaev | Russian, English |
| 2. | Report - "Collection of materials and preparation of report on the condition of ecology, drinking water supply, land reclamation, pumping stations operating and energy supply of pilot canals infrastructure". Part 1 - SFC; Part 2 - AAC; Part 3 - KhBC | 1.1-1.5 | 2005 | N.N. Mirzaev | Russian |
| 3. | Report - "Guidelines on water accounting for hydrometers of main canals" | 1.7.8 | 2006 | N.N. Mirzaev | Russian |
| 4. | Guidelines for users on implementing MIS tools to drawing up and correcting water use plan and calculating water allocation indices at the pilot canal level (project) | 1.5.b.13 | 2006 | N.N. Mirzaev | Russian |
| 5. | Report - "Guideline on calculating and analysing water allocation indices" (project) | 1.7.1 | 2006 | N.N. Mirzaev | Russian |
| 6. | Completion of the "Recommendations on preventing and adjudication of disputes and conflict situations" project | 1.3.7.1 | 2006 | N.N. Mirzaev | Russian |
| 7. | Completion of the "Recommendations on perfection of the acting legislation taking into account the transition experience to water use management in big canals on the basis of hydrographical principle and public participation principle" | 1.3.7.2 | 2006 | N.N. Mirzaev | Russian |
| 8. | Report - "Analysis of monitoring materials and preparation of the report on ""About water accounting reliability and accuracy in pilot canals" | 1.7.4 | 2006 | N.N. Mirzaev | Russian |
| 9. | Report - ""Proposals on interfacing MIS of the "IWRM-Ferghana" project with automation system" | 1.5.c.10 | 2007 | N.N. Mirzaev | Russian |
| 10. | Report "Guidelines on operation of canals" | 1.5.b.17 | 2007 | N.N. Mirzaev | Russian |
| 11. | Report "Development and adaptation of models and programs on water allocation management in pilot canals in critical situations (drought, flood)" | 1.5.c.2, 1.5.c.3 | 2008 | N.N. Mirzaev | Russian |
| 12. | Report - Surface, ground and back water monitoring organization in pilot WUAs | 2.3.6.2 | 2005 | M.A. Pinkhasov, A. Alimjanov | Russian |
| 13. | Report - Alternative system of water allocation. Elaboration of the alternative system procedure of daily water allocation among pilot WUAs | 2.3a | 2005 | M.A. Pinkhasov A. Alimjanov | Russian |
| 14. | Report - Assist the three pilot WUAs to resolve the problems of reclamation, drainage, ground water and salinity (by the example of WUA "Akbarabad") | 2.2 | 2006 | M.A. Pinkhasov, H.Yakubov | Russian |
| 15. | Guideline on drawing up business-plan for WUAs | 2.1.4 | 2007 | M.A. Pinkhasov, O. Anarbekov | Russian |
| 16. | Report - Identification of water users' irrigated lands on belonging them to particular hydromodule regionalization and crop irrigation regime correction by the example of WUA "Akbarabad" | 2.3a5 | 2007 | G.V. Stulina, G.F. Solodkiy | Russian |
| 17. | Report - Assist the three pilot WUAs in reclamation, drainage, ground water and salinity problems resolving | 2.2 | 2007 | D. Ziganshina | Russian |
| 18. | Typification of existing irrigated lands of WUA's farms along SFC and KhBC according to land drainability | 2.2.1 | 2007 | Kh.E. Yakubov, P.D. Umarov | Russian |

| № | Title | Task | Date | Responsible | Language |
|-----|--|-----------|------|---|----------|
| 19. | Guidelines on the Plan of reclamation measures for short-term and long-term periods in WUAs established along SFC | 2.2.1.2 | 2007 | Kh.E. Yakubov, P.D. Umarov | Russian |
| 20. | Guidelines on safe collector-drainage water use (CDW) for irrigation | 2.2.3 | 2007 | Kh.E. Yakubov, P.D. Umarov | Russian |
| 21. | Report - Estimate feasibility of procedures of alternative water allocation system and its management within WUA | 2.3 | 2007 | A. Alimjanov | Russian |
| 22. | Report - Chapter GIS | 2.3a5 | 2007 | S.G. Jereljeva | Russian |
| 23. | Report - Chapter GIS | 2.4 | 2007 | G.F. Solodkiy, S.G. Jereljeva | Russian |
| 24. | Yearly report on "Advanced technologies adoption below the WUA level " | | 2005 | Sh.Sh. Mukhamejanov, S.A. Nerozin | Russian |
| 25. | Yearly report on "Advanced technologies adoption below the WUA level " | | 2006 | Sh.Sh. Mukhamejanov | Russian |
| 26. | Yearly report on "Advanced technologies adoption for increasing water productivity" in 2007 | | 2007 | Sh.Sh. Mukhamejanov | Russian |
| 27. | Yearly report on "Transboundary Small Rivers" component | 5.1 - 5.3 | 2007 | Yu.Kh. Rysbekov | Russian |
| 28. | IMT Concept for Kyrgyz Pilot Canal | 1.2 | 2005 | M.Yakubov, H.Manthrithilake, I.Abdullaev | English |
| 29. | Discussion paper on Management Transfer Concept for Kyrgyzstan Pilot Canal | 1.2 | 2005 | H. Manthrithilake | English |
| 30. | Performance indicators for irrigation canal system managers or water user associations (WUA) | 1.7 | 2005 | H. Manthrithilake | English |
| 31. | The 2004 Follow-up Survey Report | 2.6 | 2005 | M. Yakubov | English |
| 32. | Report on the achievements and constraints faced in the project IWRM-Ferghana | 1.3 | 2006 | Gunchinmaa Tumur | English |
| 33. | Water Allocation: Review of Alternatives and Further Steps | 1.5a | 2006 | I. Abdullaev | English |
| 34. | Brief Report on position 1.8 | 1.8 | 2006 | H.Manthrithilake, A.Tashmatov | Russian |
| 35. | Brochure on importance of establishing WUGs for the maintenance of WUAs sustainability and water management improvement | 2.4 | 2006 | J.Kazbekov, I.Abdullaev, H.Manthrithilake, K.Jumabaev | Russian |
| 36. | Repeated survey of three pilot WUAs of Ferghana Valley | 2.6a | 2006 | M. Yakubov | Russian |
| 37. | Peculiarities of Irrigation of wheat | 3.1 | 2006 | A.Karimov | Russian |
| 38. | Scheduling inter-irrigation period | 3.1 | 2006 | A.Karimov | Russian |
| 39. | Water harvesting, additional and deficit irrigation | 3.1 | 2006 | A.Karimov | Russian |
| 40. | Importance of climate and weather conditions forecast in irrigation scheduling for farmers | 3.1 | 2006 | J.Kazbekov | Russian |
| 41. | Proceedings of the workshop for consensus building amongst the key stakeholders within a new institutional set-up of water management | 1.1b | 2007 | N. Nizamedinkhodjayeva O. Anarbekov K. Jumaboiev | English |
| 42. | Learning from lower Colorado river experience in water allocation: Lessons to improve water resources allocation on pilot canals of Ferghana Valley | 1.5 | 2007 | A.Karimov | Russian |
| 43. | Cases of alternative water allocation procedures from international experience. Alternative water allocation in Kyrgyzstan: Learning from lower Colorado river basin and New South Wales practices | 1.5 | 2007 | A.Karimov | English |
| 44. | Methodology for CWC and UWU self-assessment | 1.7 | 2007 | N. Nizamedinkhodjayeva | English |
| 45. | Methodology for assessment of the Canal Management Organization's performance by the Union of Water Users | 1.7 | 2007 | N. Nizamedinkhodjayeva | English |
| 46. | Business plan write-up guide for WUAs | 2.1a | 2007 | O. Anarbekov | Russian |
| 47. | Tentative business plan of "Japalak" WUA for 2008-2012 | 2.1b | 2007 | O. Anarbekov | Russian |
| 48. | Asset management Guidelines for WUAs (Draft) | 2.1c | 2007 | O. Anarbekov | English |
| 49. | Recommendation for salt affected and water logged land remediation at Japalak farm | 2.2 | 2007 | A.Karimov | English |
| 50. | The 2007 Follow-up Survey of 3 pilot Water User Associations in the Ferghana Valley | 2.6 | 2007 | T. Gunchinmaa | English |
| 51. | Methodology for WUA assessment through user perception survey | 2.6 | 2007 | Gunchinmaa Tumur | English |
| 52. | Proposal for User-based Evaluation of WUAs Irrigation Performance | 2.6 | 2007 | M. Yakubov | English |
| 53. | Report on the Regional Knowledge Fair on Integrated Water Resources Management in Central Asia | 4.2 | 2007 | J.Kazbekov, O.Anarbekov, K.Jumabaev et al. | English |
| 54. | Technical Note № 2, 2007 | 4.3 | 2007 | H.Manthrithilake, A.Tashmatov | Russian |
| 55. | Technical Note № 1, 2006 | 4.3 | 2007 | H.Manthrithilake, A.Tashmatov | Russian |

Table 6.2 List of publications that needs further improvement and recommended for wider dissemination during Phase 4

| № | Title | Language | Needs improvement | Recommended for Phase 4 |
|-----|---|--|-------------------|-------------------------|
| 1. | IMT Concept for Main Canals | Russian, English | | ✓ |
| 2. | How to Establish WUA? | English, Russian, Tajik, Kyrgyz, Uzbek | | ✓ |
| 3. | Social Mobilization and Intuitional Development Approach and Strategy | English, Russian, Tajik, Kyrgyz, Uzbek | | ✓ |
| 4. | Performance indicators for irrigation canal system managers or water user associations (WUA) | English | | ✓ |
| 5. | Guideline on IWRM for WUAs jointly with MAWR of Uzbekistan | Uzbek | | ✓ |
| 6. | Water Allocation: Review of Alternatives and Further Steps | Russian | ✓ | |
| 7. | Brochure on importance of establishing WUGs for the maintenance of WUAs sustainability and water management improvement | Russian, Tajik, Kyrgyz, Uzbek | | ✓ |
| 8. | Peculiarities of Irrigation of wheat | Russian | | ✓ |
| 9. | Scheduling inter-irrigation period | | | ✓ |
| 10. | Water harvesting, additional and deficit irrigation | | | ✓ |
| 11. | Weather and irrigation scheduling for farmers | Russian, Tajik, Kyrgyz, Uzbek | | ✓ |
| 12. | Cases of alternative water allocation procedures from international experience. Alternative water allocation in Kyrgyzstan: Learning from lower Colorado river basin and New South Wales practices | English, Russian | | |
| 13. | Methodology for CWC and UWU self-assessment | | ✓ | |
| 14. | Business planning guide for WUAs | English, Russian | | ✓ |
| 15. | Business planning guide for Canals | English, Russian | | ✓ |
| 16. | Asset management Guidelines for WUAs (Draft) | Russian | ✓ | |
| 17. | Methodology for WUA assessment through user perception survey | English, Russian | | ✓ |
| 18. | Proposal for User-based Evaluation of WUAs Irrigation Performance | English | ✓ | |
| 19. | Technical Note № 1: Application of IWRM Principles | Russian | | ✓ |
| 20. | Technical Note № 2: Capacity Building for IWRM Implementation | Russian | | ✓ |
| 21. | Technical Note № 3: IWRM Principles | Russian | | ✓ |
| 22. | Technical Note № 4: Public Participation in the Governance | Russian | ✓ | |
| 23. | CD collection of IWRM Ferghana project materials | English, Russian, Tajik, Kyrgyz, Uzbek | | ✓ |
| 24. | 5 Module Training of WUA which comprises of Crop Water Requirements, Water Use Planning, Water Distribution amongst users, Water measurement/accounting & Assessment of Water Management Performance of WUA. | Russian | | ✓ |
| 25. | The concept of pilot canals joint activity control authority | Russian, English | | ✓ |
| 26. | Guidelines on water accounting for hydrometers of main canals | Russian | | ✓ |
| 27. | Guideline on calculating and analysing water allocation indices | Russian | | ✓ |
| 28. | Recommendations on preventing and adjudication of disputes and conflict situations | Russian | | ✓ |
| 29. | Recommendations on perfection of the acting legislation taking into account the transition experience to water use management in big canals on the basis of hydrographical principle and public participation principle | Russian | | ✓ |
| 30. | Guidelines on operation of canals | Russian | | ✓ |
| 31. | Development and adaptation of models and programs on water allocation management in pilot canals in critical situations (drought, flood) | Russian | | ✓ |
| 32. | Alternative system of water allocation. Elaboration of the alternative system procedure of daily water allocation among pilot WUAs | Russian | | ✓ |

| № | Title | Language | Needs improvement | Recommended for Phase 4 |
|-----|--|----------|-------------------|-------------------------|
| 33. | Guideline on drawing up business-plan for WUAs | Russian | | ✓ |
| 34. | Guidelines on the Plan of reclamation measures for short-term and long-term periods in WUAs established along SFC | Russian | | ✓ |
| 35. | Guidelines on safe collector-drainage water use (CDW) for irrigation | Russian | | ✓ |
| 36. | Guidelines on MIS tools use for drawing up and correction of water use plans and calculation of water distribution indicators at a pilot canal level for users (project) | Russian | ✓ | ✓ |

Table 6.4 WUA development inventory for Tajikistan

| Name of WUA / Large farm / Primary water user | District | Province | Hydrographic or administrative | SMID on WUA establishment | | | | | SMID in not dismantled farms | | | | | Reorganization into the hydrographic WUAs | | | | WUA Strengthening | | | | | | | | | | | |
|---|-----------|----------|--------------------------------|--------------------------------|---------------------------|------------------------|-----------------------|---|--|-----------------------------------|---------------------------------------|---|--------------------------|---|---|--|---|---------------------------|-----------------------|--------------------|--|------------------------------------|---|---|---|--|--|--|------------------------------------|
| | | | | Formation of initiative groups | Meetings with water users | Registration documents | WUA Assembly Meetings | Assistance in registration in the justice departments | Trainings and awareness on IWRM principles | Facilitation and creation of WUGs | Water distribution by IWRM principles | Involvement and participation in canal governance | Hydrographic composition | SMID among key stakeholders on reorganization | Assistance in conducting General Assembly | Renewal of WUA bylaws and resigning of contracts | Organizational strengthening basic documentations | Business plan development | Training on 5 modules | Development of WUP | Simple, user friendly water distribution schedules | Facilitation of self propelled WUG | Involvement of WUGs into WUA governance | Involving of WUA Councils in canal governance | Monthly informal network of WUA leaders "GAP" | Formalization of WUG and contracts signed with WUA on behalf of water user | Support WUG initiatives on hydropests construction | Facilitating collective action "Hashars" | Links with local rural authorities |
| 1 WUA Madanyat | Rasulov | Sogd | H | + | + | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 2 WUA Tochikobod | Rasulov | Sogd | H | + | + | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 3 WUA Turdiboev | Rasulov | Sogd | H | + | + | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 4 WUA Zarafshan | Rasulov | Sogd | H | + | + | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 5 WUA Kosimov | Gafurov | Sogd | H | + | + | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 6 WUA Gulyakondoz | Rasulov | Sogd | H | + | + | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 7 WUA Nurafshon | Rasulov | Sogd | H | + | + | - | + | + | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 8 WUA Guliston | Gafurov | Sogd | H | + | + | - | + | - | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 9 P/c Samadov | Rasulov | Sogd | A | + | + | - | + | - | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 10 P/c Khojabakirgan | Gafurov | Sogd | A | + | + | - | + | - | + | + | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 11 P/c Bobokalonov | Gafurov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 12 P/c Digma | Rasulov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 13 P/c Leningrad | Rasulov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 14 P/c Azizov | Gafurov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 15 P/c Rasulov | Gafurov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 16 P/c Nabiev | Gafurov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 17 Farm Bogvar | Gafurov | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 18 WUA Ravot | Kanibadam | Sogd | A | - | + | - | - | - | + | - | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | + | - |

Table 6.6 *List of grey and project reports produced along IWRM FV project*

| No | Title | Task | Date | Responsible | Language |
|-----|--|------------------|------|---|----------|
| 1. | IMT Concept for Aravan-Akbura Canal | 1.2 | 2005 | M.Yakubov, H.Manthrithilake, I.Abdullaev | Russian |
| 2. | Report on the Seminar to discuss IMT Options for Pilot Aravan-Akbura Canal (AAC) in Osh, Kyrgyzstan | 1.2 | 2005 | H. Manthrithilake, J.Kazbekov, M. Yakubov | English |
| 3. | Water Allocation: Review of Alternatives and Further Steps | 1.5 | 2005 | I. Abdullaev | English |
| 4. | Water management principles - planning of changes for 3 rd Phase | 2.3 | 2005 | I. Abdullaev | English |
| 5. | Report from training seminars on establishment and progress of IWMI field teams in Kyrgyzstan, Uzbekistan and Tajikistan | 2.4 | 2005 | I. Abdullaev, M.Yakubov, K.Jumabaev, O.Anarbekov, J.Kazbekov | Russian |
| 6. | Progress Report on Component 2. WUAs allocating water by IWRM guidelines | 2.4 | 2005 | J. Kazbekov O. Anarbekov | English |
| 7. | Report on below WUA level activities | 3.1 | 2005 | I. Abdullaev, K. Jumaboev | English |
| 8. | Report on stakeholders inventory in the zone of pilot canals | 1.1b | 2006 | M.Yakubov | Russian |
| 9. | Model Business plan of Aravan-Akbura canal control office | 1.4 | 2006 | O.Anarbekov | Russian |
| 10. | Draft Business plan write-up guide for the main canal control office | 1.4 | 2006 | O.Anarbekov | Russian |
| 11. | Water Allocation: Review of Alternatives and Further Steps | 1.5a | 2006 | I. Abdullaev | Russian |
| 12. | Draft guide for developing business plans of WUAs | 2.1 | 2006 | O.Anarbekov | Russian |
| 13. | Recommendation for salt affected and water logged land remediation at Japalak farm | 2.2 | 2006 | A.Karimov | English |
| 14. | Report on implementation of indicators of efficiency of WUAs activity | 2.3 | 2006 | I.Abdullaev, K.Jumabaev, J.Kazbekov | Russian |
| 15. | Report on progress of WUAs along SFC, HBC, AAC (position 2.4) | 2.4 | 2006 | J.Kazbekov, K.Jumabaev, O.Anarbekov | Russian |
| 16. | Report on conducting of training on water management at the level of WUA and preparation of water use plan in Jetysai and Turkestan areas of South-kazakhstan oblast | 2.5 | 2006 | I.Abdullaev, M.Yakubov, K.Jumabaev, J.Kazbekov | Russian |
| 17. | Public awareness activity of IWRM FV project (Phase III) | 1.1 | 2007 | K.Mosin | English |
| 18. | Business plan write-up guide for the main canal control office | 1.4 | 2007 | O. Anarbekov | Russian |
| 19. | Model of AAC Business plan for 2008-2010 | 1.4a | 2007 | O.Anarbekov | Russian |
| 20. | Back to office report on conducted workshop introduction of IWRM principles into the education curriculum | 1.8 | 2007 | K. Jumaboev O. Anarbekov | English |
| 21. | Promotion of saline and waterlogged land melioration and drainage | 2.2 | 2007 | A.Karimov | Russian |
| 22. | Assist pilot WUAs in addressing reclamation, drainage, groundwater and salinity issues | 2.2 | 2007 | A.Karimov | English |
| 23. | Back to office report - April 2007 | 2.4 | 2007 | T. Gunchinmaa K. Jumaboev J. Kazbekov | English |
| 24. | Report on Water User Group support activities along IWRM Ferghana Project | 2.4 | 2007 | J. Kazbekov H. Manthrithilake O. Anarbekov K. Jumaboev | English |
| 25. | Report on conducted study in the basins of TSR of Shahimardansay and Hodjibakirgnsay | 5.1 | 2007 | B.Mirzaev | Russian |
| 26. | Shakhimardan and Khodjabakirgan Transboundary Small Rivers: Nature of Disputes over Irrigation Water as perceived by stakeholders | 5.1a | 2007 | N. Nizamedinkhodjayeva, B.Mirzaev | English |
| 27. | Elaborating the proposals on alteration to draft UWU Chapter for joint water management | 1.3.1- 3.3 | 2005 | N.N. Mirzaev | Russian |
| 28. | Water allocation monitoring and assessment | 1.7.16 - 1.7.18 | 2005 | N.N. Mirzaev | Russian |
| 29. | Report - Elaborating "Contract about transferring authority" project | 1.3.5 | 2005 | N.N. Mirzaev | Russian |
| 30. | Report - " Organization of trainings on planning water allocation and water management in pilot canals | 1.5.c.13 | 2005 | N.N. Mirzaev | Russian |
| 31. | Report - "About water accounting reliability and accuracy in pilot canals" | 1.7.1- 1.7.6 | 2005 | N.N. Mirzaev | Russian |
| 32. | Report - "Guideline on calculating and analysing water allocation indices" (project) | 1.7.13, 1.7.14 | 2005 | N.N. Mirzaev | Russian |
| 33. | Report - "Plan of operations #2: Perfection of management structure of SFMC Authority" (project) | 1.1.a.8, 1.1.a.9 | 2005 | N.N. Mirzaev | Russian |
| 34. | Report - "Dissemination of understanding a new organization structure during the transition period with wide stakeholders involving | 1.2 | 2005 | N.N. Mirzaev | Russian |
| 35. | Report - "Preparation of material for trainings, organization of trainings on increasing water allocation reliability and accuracy" | 1.7.11 | 2005 | N.N. Mirzaev | Russian |
| 36. | Contract between Osh BWOA of DWR, MLRWR&PI of the Kyrgyz Republic and AAC Union of Water Users | 1.1.c.4.1 | 2006 | N.N. Mirzaev | Russian |

| № | Title | Task | Date | Responsible | Language |
|-----|--|---|------|--------------|----------|
| 37. | Report - "Perfection of calculation methods for operative water allocation plan on the MIS basis" | 1.5.b.7 | 2006 | N.N. Mirzaev | Russian |
| 38. | Completion of models and programs on calculating water allocation indices | 1.5.b.9 | 2006 | N.N. Mirzaev | Russian |
| 39. | Preparation of the final report on realizing results of "Plans of operations # 1-4". 1.2.2-1.2.3. Regular conducting of meetings of UWU Council 1.2.11. Preparation of yearly reports on UWU work organization during the transition period. Part 1 - SFC; Part 2 - AAC; Part 3 - KhBC | 1.1.a.7, 1.1.a.12, 1.5.d.6, 1.5.d.12 | 2006 | N.N. Mirzaev | Russian |
| 40. | Report - "WaterCalc" program testing | 1.5 | 2007 | N.N. Mirzaev | Russian |
| 41. | Report - GIS department | 1.5 | 2007 | N.N. Mirzaev | Russian |
| 42. | Report on work executing at Pilot Canal operating. GIS department. Andijan province | 1.5 | 2007 | N.N. Mirzaev | Russian |
| 43. | Report "Assessment of the project affect using operating indices, water users' surveys about demand satisfaction, secondary data etc." (1.7.3-1.7.9) | 1.7 | 2007 | N.N. Mirzaev | Russian |
| 44. | Report "Testing models and programs on calculating operative Pilot Canals" Report "Preparation of materials and conducting trainings on planning water allocation in pilot canals for workers of hydrosites" | 1.5.b.11, 1.5.c.12 | 2007 | N.N. Mirzaev | Russian |
| 45. | Report "Co-operating management , management functions and intersectoral interests in single CMO in three selected pilot canals (SFC, AAC, KhBC)" Report "Disseminating the understanding a new organization structure during the transition period with wide involving stakeholders" | 1.1 и 1.2 | 2007 | N.N. Mirzaev | Russian |
| 46. | Report "Defining the hydromodule zoning for each district on the BISA request. Calculating water consumption Calculating water consumption by SFC outlets | 1.5.в.1 | 2007 | N.N. Mirzaev | Russian |
| 47. | Guidelines on the operation of pilot canals | 1.5.b.17 | 2007 | N.N. Mirzaev | Russian |
| 48. | Report "Correction and completion of "WaterCalc" program" | 1.5 | 2008 | N.N. Mirzaev | Russian |
| 49. | Report "Increasing water accounting reliability and accuracy in pilot canals" | 1.5.e | 2008 | N.N. Mirzaev | Russian |
| 50. | Report "Organization of monitoring of water accounting reliability in pilot canals" | 1.5.e.1 | 2008 | N.N. Mirzaev | Russian |
| 51. | Report "Preparation of materials and conducting workshops on planning water allocation in pilot canals for workers of hydrosites" | 1.5.c.12 | 2008 | N.N. Mirzaev | Russian |

Table 6.7 List of publications and other PR materials in the mass media

| № | Title | Type of media | Name of media | Date |
|-----|---|---------------|-----------------------------|------------------------------|
| 1. | Round table meeting in Gulistan: On IWRM Ferghana Project | TV | Uzbek State TV ("Akhborot") | June 17, 2006 |
| 2. | Round table meeting in Gulistan: On IWRM Ferghana Project | Radio | Uzbek Central Radio | June 1, 2006 June 3, 2006 |
| 3. | Round table meeting in Gulistan: On IWRM Ferghana Project | newspaper | Selskaya Pravda | June 3, 2006 |
| 4. | New organizational structure for effective irrigation | newspaper | Leninabadskaya pravda (Rus) | June 10, 2006 |
| 5. | Bright spots of Uzbekistan | web site | Pravda Vostoka (Rus) | July 13, 2006 |
| 6. | Bright spots of Uzbekistan | newspaper | Pravda Vostoka (Rus) | July 13, 2006 |
| 7. | Exhibition of new agro technology | newspaper | Eco (Rus) | August 17, 2006 |
| 8. | What is happening in Japalak WUA? | newspaper | Osh janyrygy (Kyrg) | August 25, 2006 |
| 9. | How to increase crop productivity? | newspaper | Pravda Vostoka (Rus) | September 6, 2006 |
| 10. | How to increase crop productivity? | web site | Pravda Vostoka (Rus) | September 6, 2006 |
| 11. | Farmer instructed on integration of technology for saline soil management | web site | Press-Uz (Eng, Uzb, Rus) | September 11, 2006 |
| 12. | Farmer instructed on integration of technology for saline soil management | web site | UzReporet (Eng, Uzb, Rus) | September 11, 2006 |
| 13. | New technologies for farmers to manage water | magazine | Khumo (Rus) | September 21, 2006 |
| 14. | Why there is lack of water in Uzbekistan | web site | Press-Uz (Eng, Uzb, Rus) | October 5, 2006 |
| 15. | Why there is lack of water in Uzbekistan | newspaper | Pravda Vostoka (Rus) | October 3, 2006 |
| 16. | Why there is lack of water in Uzbekistan | web site | Pravda Vostoka (Rus) | October 3, 2006 |

| № | Title | Type of media | Name of media | Date |
|-----|--|---------------|----------------------------|--------------------------|
| 17. | Training of WUA managers | television | Osh TV (Kyrgyz) | December 22, 2006 |
| 18. | Water resources management | newspaper | Novosti Uzbekistana (Rus) | December 1, 2006 |
| 19. | Water resources management | web site | Novosti Uzbekistana (Rus) | December 1, 2006 |
| 20. | Rehabilitation and fertility improvement on the saline soils | Web site | UZA | April 7, 2007 |
| 21. | Visit IWMI delegation to Uzbekistan | Web site | Krestyanskie vedomosti | April 14, 2007 |
| 22. | Visit IWMI delegation to Uzbekistan | Web site | UzReport | April 4, 2007 |
| 23. | Everyone will get enough water | TV | Ferghana Regional TV | 3 times in June, 2007 |
| 24. | Everyone will get enough water | TV | Keremet Kyrgyz regional TV | 3 times in June, 2007 |
| 25. | Study center | newspaper | Toshlok Tongy | June 15, 2007 |
| 26. | WUA fair | TV | Keremet Kyrgyz regional TV | September 9, 2007 |
| 27. | WUA fair | newspaper | Kuva haety | September 14, 2007 |
| 28. | Everyone will get water | newspaper | Itogi Nedeli | January 25, 2008 |
| 29. | Everyone will get enough water | TV | Ferghana Regional TV | 3 times in January, 2008 |
| 30. | Everyone will get enough water | TV | Keremet Kyrgyz regional TV | 3 times in January, 2008 |
| 31. | Tashkent to host workshop to discuss new phase of IWRM project | Web site | UzReport | February 1, 2008 |
| 32. | IWRM-Ferghana project regional meeting | Radio | Uzbekistan | February 5, 2008 |
| 33. | Farmers take part in water resources management | newspaper | Uzbekistan today | April 10, 2008 |
| 34. | Farmers take part in water resources management | Web site | Uzbekistan today | April 10, 2008 |

Table 6.8 *List of printed and disseminated materials of IWMI (2005-2008)*

| № | Printed and dissemination materials |
|------------------|--|
| Brochures | |
| 1. | Why farmers establish WUG? (Rus, Uzb, Tajik, Kyrg) |
| 2. | Water distribution at WUA level (Rus, Uzb, Kyrg, Tajik) |
| 3. | Assessment of WUA irrigation activities (Rus) |
| 4. | Weather and yield (Rus) |
| 5. | Policy brief 1 (Rus, Eng) |
| 6. | Policy brief 2 (Rus, Eng) |
| 7. | Report on trip of the IWRM-FV Projects Specialists to Turkey |
| 8. | WUA fair report (Eng) |
| 9. | How to establish WUA? (Eng, Rus, Kyrg, Tajik, Uzb) |
| 10. | Social mobilization and Institutional Development Approach and strategy (Eng, Rus) |

| № | Printed and dissemination materials |
|-----------------|-------------------------------------|
| Booklets | |
| 11. | IWMI |
| 12. | IWMI in Central Asia |
| 13. | IWRM - FV project phase III |
| 14. | Canal level activities |
| 15. | WUG level activities |
| 16. | Below WUA level activities |
| 17. | WUA level activities |
| 18. | WUA Isan |
| 19. | WUA Japalak |
| 20. | WUA Joipas |
| 21. | WUA Akbarabad |
| 22. | WUG Nishob |
| 23. | WUA Mashal |
| 24. | WUA Hojibek |
| 25. | WUA Zarafshan |
| 26. | WUA Murza-aji |
| 27. | WUA Omad Zilol |
| 28. | WUAs Togikobod and Madaniat |
| 29. | IWRM and transboundary small rivers |

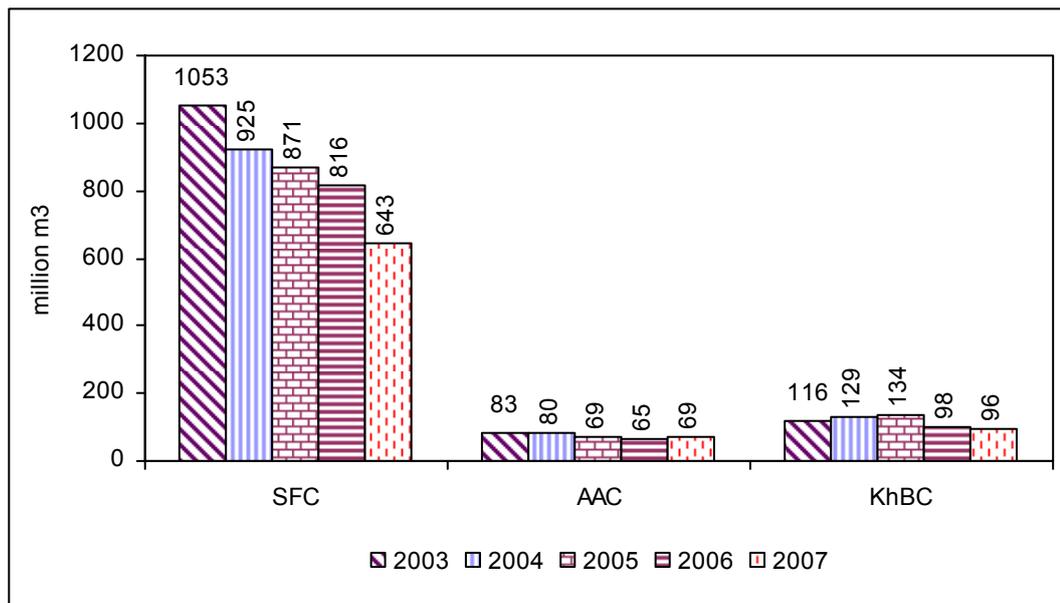
| № | Printed and dissemination materials |
|----------------|-------------------------------------|
| Posters | |
| 30. | IWMI |
| 31. | IWRM - FV project phase III |
| 32. | Canal level activity |
| 33. | WUG level activity |
| 34. | Below WUA level activity |
| 35. | IWRM principles |
| 36. | WUA level activity |
| 37. | WUA Isan |
| 38. | WUA Japalak |
| 39. | WUA Joipas |
| 40. | WUA Akbarabad |
| 41. | WUG Nishob |
| 42. | WUA Mashal |
| 43. | WUA Hojibek |
| 44. | WUA Zarafshan |
| 45. | WUA Murza-aji |
| 46. | WUA Omad Zilol |
| 47. | WUAs Tojikobod and Madaniat |

| № | Printed and dissemination materials |
|----------------------------------|--|
| Other awareness materials | |
| 48. | IWRM-FV calendar 2007 |
| 49. | IWRM-FV calendar 2008 |
| 50. | E-manuals (CD-collection of all projects materials - 2 issues) |
| 51. | Movie on WUA fair in Kyrgyzstan (Eng) |
| 52. | Movie on Success story of WUA Akbarabad |
| 53. | Folder with success stories of pilot WUAs |

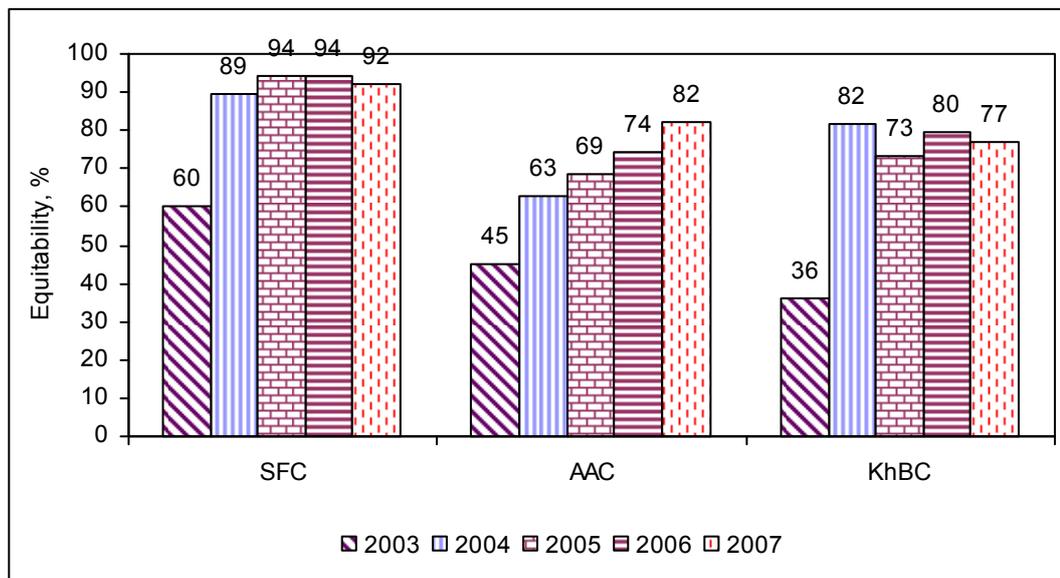
Table 6.9 *List of printed and disseminated materials of SIC (2005-2008)*

| № | Printed and dissemination materials |
|--------------------|---|
| Pilot canal | |
| 1 | Guidelines on calculating and analysing water allocation indices (Rus.) |
| 2 | Guidelines on operating MIS "IWRM-Fergana" program, version 3 (Rus.) |
| 3 | Booklet - "Pilot Canals" activity (Rus.) |
| WUA | |
| 4 | Guideline on drawing up business-plan for Water Users' Association |
| 5 | Manual on planning and executing repair-and-renewal operations in WUA (Rus., Uzb.) |
| 6 | Manual on water accounting in WUA (Rus., Uzb.) |
| 7 | Manual on monitoring water accounting in WUA (Rus., Uzb.) |
| 8 | Manual on reclamation problems resolving in WUA (Rus., Uzb.) |
| 9 | Recommendations on safe use of drainage water for irrigation |
| 10 | Guideline on irrigation water allocation at the WUA level |
| Below WUA | |
| 11 | Recommendations on selecting irrigation technology scheme (Rus., Uzb.) |
| 12 | What is crop irrigation regime (Rus., Uzb.) |
| 13 | Opportunities for increasing land productivity on the basis of agro-reclamation passports of farms. (Rus., Uzb.) |
| 14 | Cotton pest and disease control (Rus., Uzb.) |
| 15 | Manual on selecting the type of water meter, and their construction and operation requirements (Rus., Uzb.) |
| 16 | Agro-reclamation passport (Rus,Engl) |
| 17 | Using mineral fertilizers for cotton in the conditions of the Fergana Valley (Rus., Uzb.) |
| 18 | Guideline on calculating and selecting the rates and elements of irrigation technology for cotton and winter wheat on the results of the IWRM-FV Project (Rus,Engl) |
| 19 | Issue 1, Law of the Republic of Uzbekistan about farms (Rus) |
| 20 | Law of the Republic of Uzbekistan about private farms (Rus) |
| 21 | Peasant farms in the Kirgiz Republic: Rights and Liabilities (Rus) |
| 22 | Agricultural cooperatives in the Kirgiz Republic (Rus) |
| 23 | Private farms in the Republic of Uzbekistan: Rights and obligations. MODEL AGREEMENTS. Issue 1. (Rus) |
| 24 | Private farms in the Republic of Uzbekistan: rights and Liabilities. MODEL AGREEMENTS. Issue 2. (Rus) |
| 25 | Agro-engineering measures and land preparation for irrigation period (Rus) |
| 26 | Main crop water requirements according to growth stage (Rus) |
| 27 | Monthly bulletins were elaborated and submitted to farmers on the following issues: agro-engineering and agro-reclamation measures on disease and pest control (Rus., Uzb.) |
| 28 | Proposals for NCSG in three republics of Fergana Valley (Rus) |
| 29 | Effective irrigation water use mechanism in farms, with little area (Rus) |
| 30 | Monthly bulletins were elaborated and submitted to farmers on the following issues: agro-engineering and agro-reclamation measures on disease and pest control (Uzb.) |

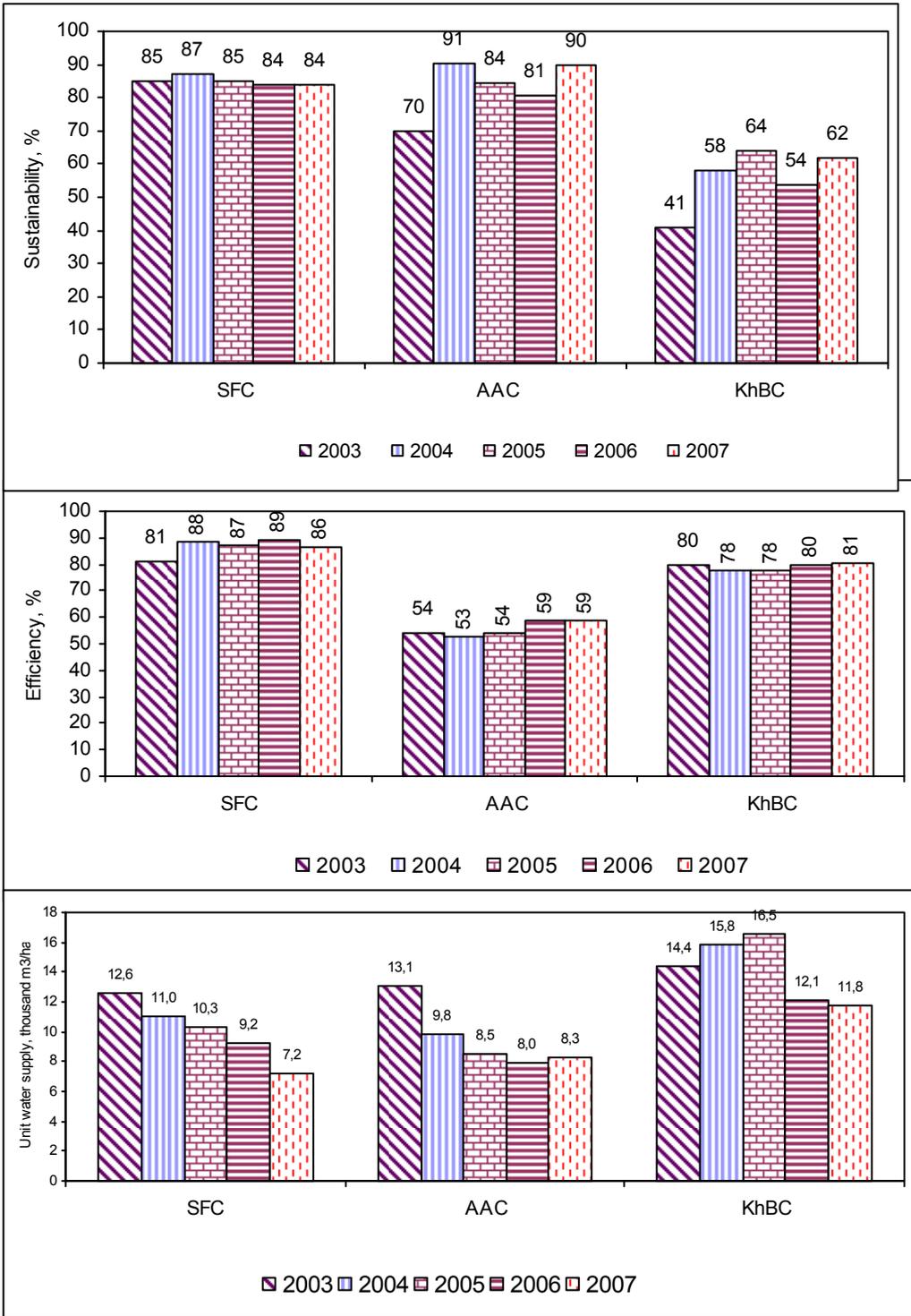
Diagrams for water distribution indicators



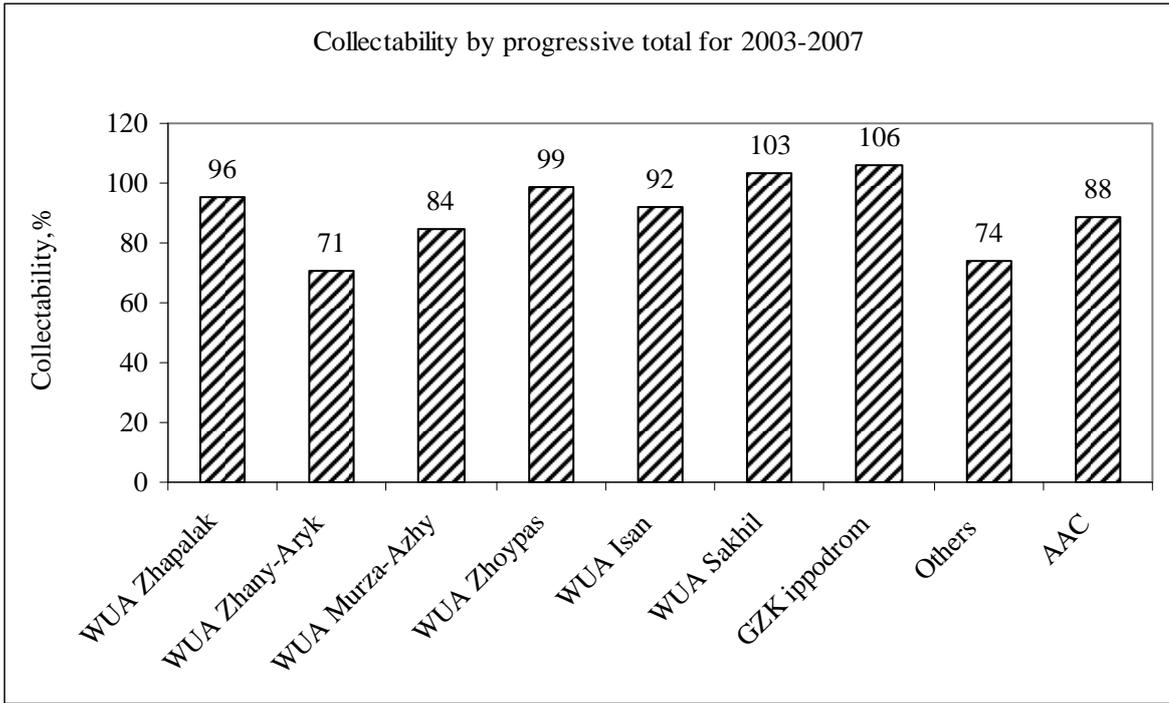
Diag. 1.1 Actual water delivery from Pilot canals to users



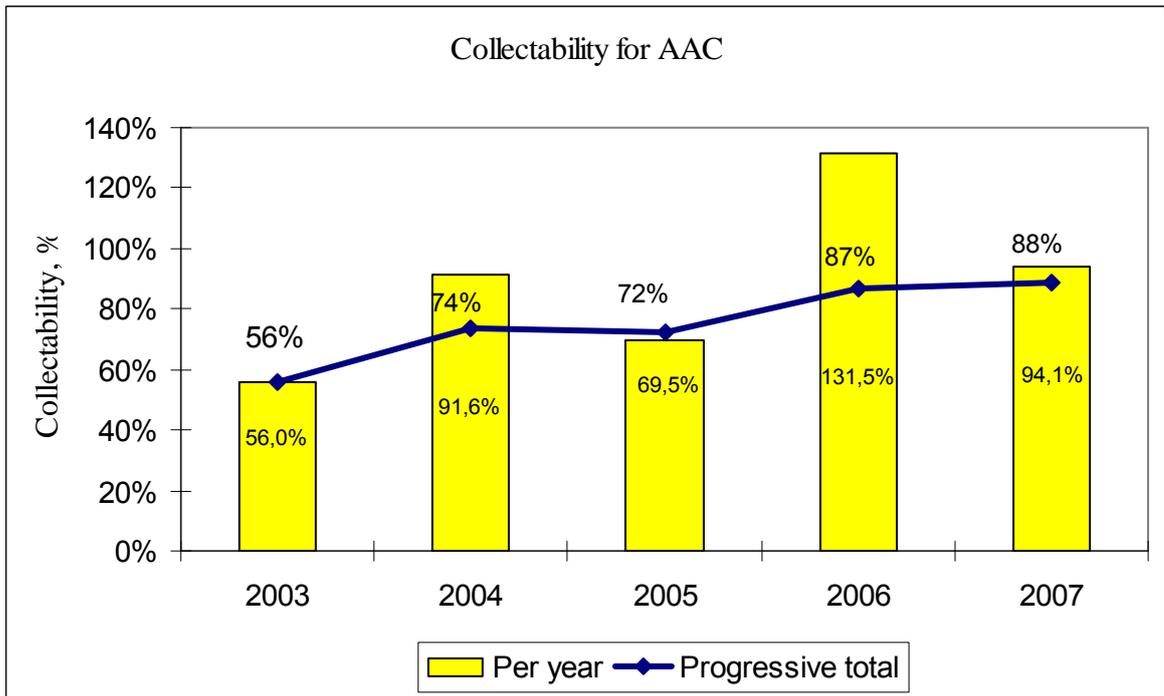
Diag. 1.2 Water supply equitability in % along pilot canals



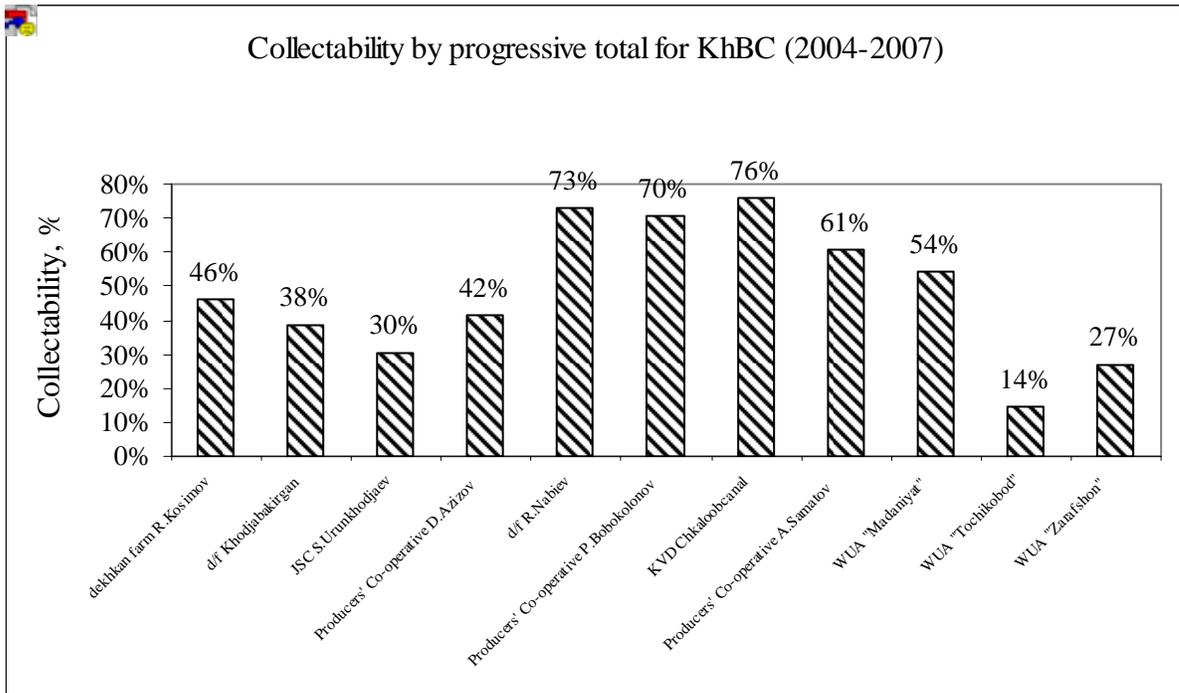
Diag. 1. 3 Sustainability (%), Efficiency (%) and Unit water supply on Pilot canals



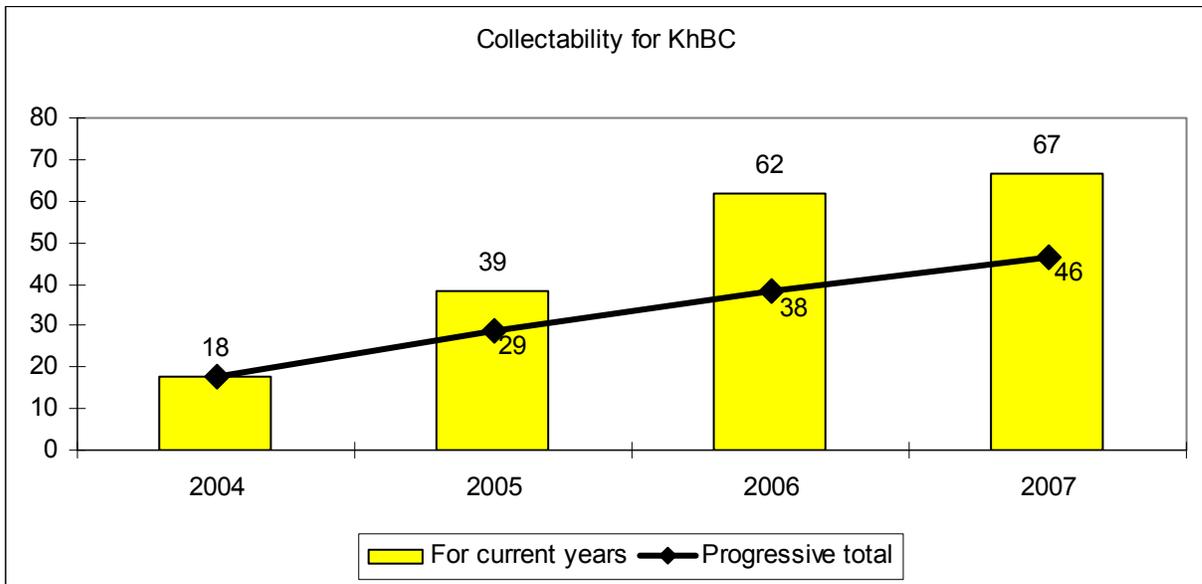
Diag. 2.1 Cumulative ISF collection in WUAs along AAC



Diag. 2.2 Cumulative ISF collection AAC CMO



Diag. 3.1 Cumulative ISF collection of users along KhBC



Diag. 3.2 Cumulative ISF collection of KhBC