

«Dissemination of advanced water productivity improvement technologies»

3.1 Prepare manuals/tutorials for extension service’s agents and trainers on know-how principles of land and water productivity improvement and water demand estimation on the basis of Phase II results

a) Summarizing methodology and know-how on water and land productivity, developing dissemination tools, their accommodation to specific field passports, irrigation schedules, etc.:

- *Preparing manuals for trainers and professionals;*

Based on the recommendations developed in the second phase on the use of irrigation water and application of cultural operations and the existing research experience of various institutions, the project has prepared manuals for extension services’ staff. Most manuals on IWRM-Fergana project experience were developed and presented in 2005. Those include: “Recommendations for selection of technological irrigation scheme”, “What is crop irrigation regime”, “Manual for calculation and selection of cotton and winter wheat irrigation depths and technique elements, based on results of IWRM-Fergana project”, “Manual for selection of water meter type, construction and operation requirements”.

In 2006, manuals on extension services for farmers were developed. Those manuals contain methods of advisory work with farmers on the basis of both visual estimation and farm surveys and 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 on the basis of climatic information (daily evaporation) and of water accounting.

In 2007, the manual “Methods of work with water-user groups on small plots on example of Sokolok canal (Kyrgyzstan)” was developed.

- *Preparing bulletins for farmers and their dissemination through extension services.*

On the basis of recommendations and manuals for rational irrigation water use and cultural operations developed for technicians and trainers, the regional and oblast project executors have prepared and developed bulletins for farmers.

Dissemination of bulletins through existing extension services and local water organizations

Table 1

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, 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 embraced in Fergana province, 10 WUAs and 399 farmers - Andijhan province, and 8 WUAs and 132 farmers - Sogd province. In total, 3264 bulletins were disseminated (Table2)

Dissemination of bulletins among farms through training

Table 2

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
		Omadi Zilol	69	276
		Zilol suv faizi	50	200
		Polvontosh Bakhor	49	196
Sogd	Dj.Rasulov	Madaniyat	33	132
		Zarafshan	33	132
		Tajikabad	33	132
		Samatov D/H	33	132
Total be January 1, 2008			816	3264

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

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

a) 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 showed that on some plots of the irrigated zone (especially in the Uzbek part of Fergana valley) land conditions changed greatly, 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 regime and watering depths based on changed conditions.

As a result of work on correction of irrigation regime, maps with different combinations of soils and irrigated land conditions were produced. By using these maps, first option of watering depths was estimated and submitted to operating services for approbation.

By processing mathematical expression, more disciplined approach to water use estimation was found.

In 2007, the obtained preliminary results were corrected according to indicators.

b) Regulatory and normative documents for the establishment of extension services.

On the basis of project activities done at farm level, major obstacles for farmer’s activities and influencing on agricultural productivity were identified in the three states of Fergana valley (Kyrgyzstan, Uzbekistan, and Tajikistan). Those obstacles were analyzed and respective proposals for governing bodies were prepared through the project NCSGs.

The following brochures were prepared: “Farms in the Republic of Uzbekistan: rights and responsibilities” and “Law of the Republic of Uzbekistan on farms. Issue 1”. The brochures were disseminated among trainers of polygons in Andijan and Fergana provinces to work with farmers and among 10 WUAs in Fergana province in SFC zone for guidance and assistance to farmers. Brochure “Law of the Kyrgyz Republic on peasant farms” was prepared for multiplication and submission to RAS consultants in Osh province, as well as regulatory information about principles of agricultural cooperative establishment and activities “Agricultural cooperatives in the Kyrgyz Republic”.

3.2 Pilot testing of suggested methods for application of know-how on land and water productivity improvement, as well as manuals and tutorials in WUAs and Basin organizations

a) creating 3...5 demonstration plots for know-how application.

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

a) -1 Irrigation water use on demonstration plots

The analysis of data on irrigation water use in the demonstration plots allows speaking about sustainability of the recommended approaches developed under the project over the period 2002-2004. The monitoring conducted in the last years shows that the unit water delivery is practically within the values obtained as a result of project irrigation measures. Some drops or lifts in water delivery indicate that farmers began to pay attention to influencing factors such as weather conditions during a year and land state and to consider them when planning watering events.

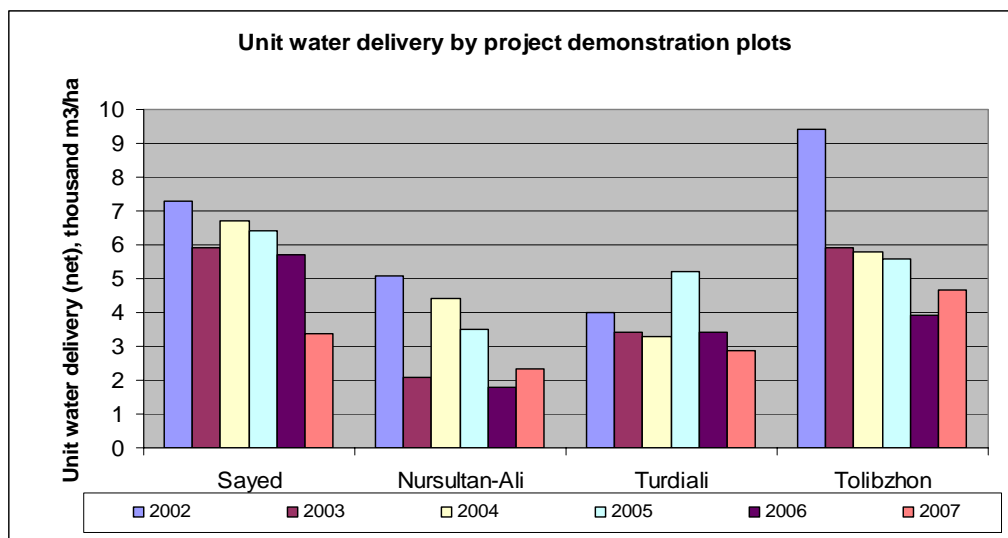


Fig. 1 Dynamics of unit water delivery by project demonstration plot

a) -2 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 obtained through cultural operation developed by the project.

Evaluation of water productivity on project demonstration plots

Table 3

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	2,40	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	2,90	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	4,70	3,7	3,6	3,7	4,2	3,9	4,1	0,4	0,61	0,71	0,75	1,0	0,87

An impact of agricultural production management and water use efficiency in demonstration fields over the period 2002-2007 may be traced from the diagram below.

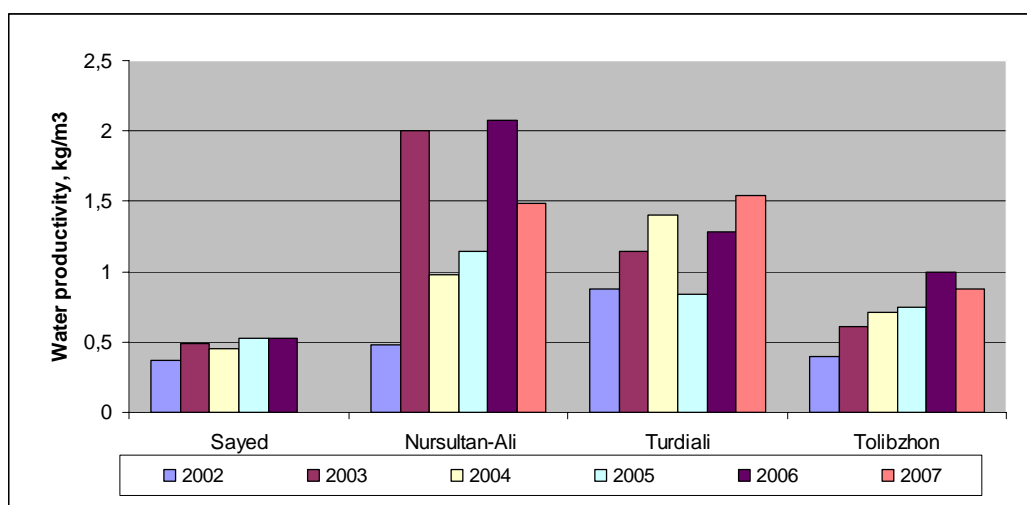


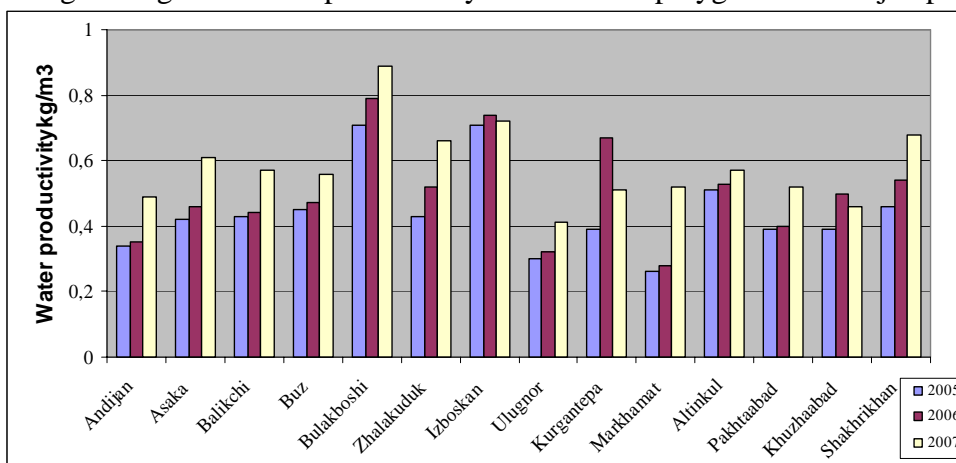
Fig. 2 Water productivity in project demonstration plots

a) -3 Evaluation of irrigation water productivity and efficiency in rayon polygons (2005-2007).

In order to disseminate advanced technologies and accumulated project experience, in 2005, the pilot rayon polygons were established in Fergana and Andijan provinces, Uzbekistan to apply and demonstrate state-of-the-art technological 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 indicates to considerable improvement of these indicators both in most rayon sites and in studies provinces as a whole.

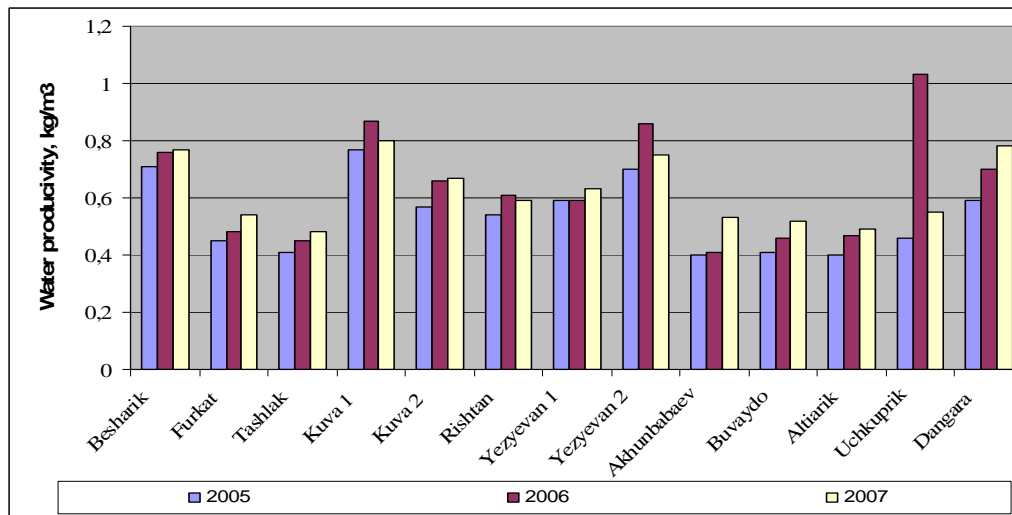
Rayon indicators of water productivity averaged for Andijan province increased by 31% for cotton as compared to the starting year 2005 (i.e. increased from 0.44 kg/m³ to 0.58 kg/m³). As to cereal crops, those indicators of irrigation water productivity and inputs over the period of 2005-2007 increased: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

Fig. 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% of the starting year 2005 (i.e. the following growth over 2005 – 2007: 0.53 kg/m³ – 0.60 kg/m³ – 0.62 kg/m³).

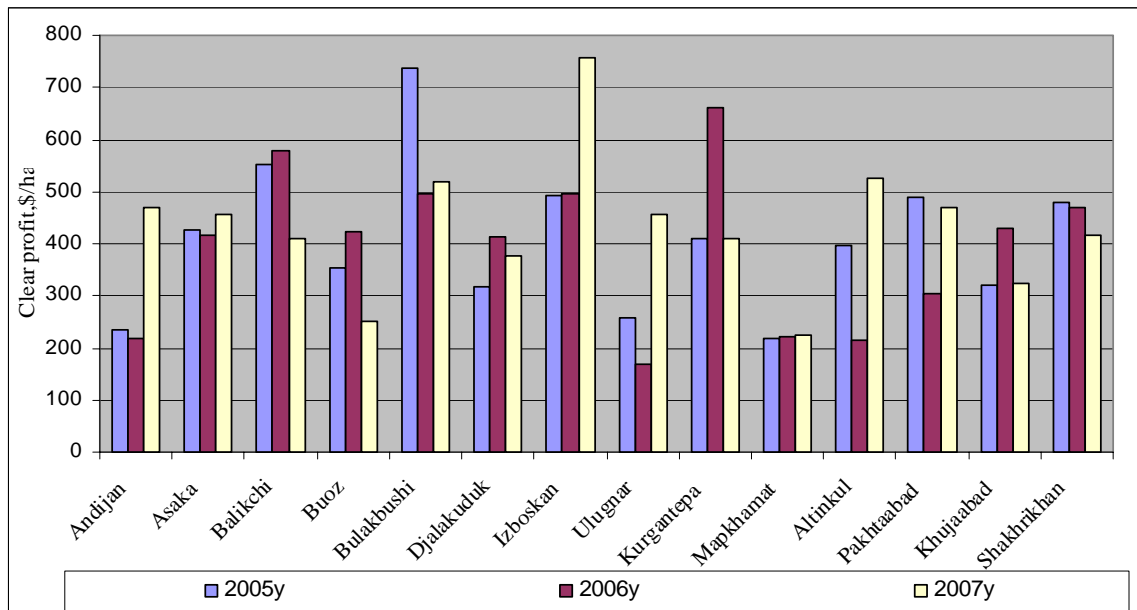
Fig. 4 Irrigation water use productivity for cotton in polygons of Andijan province



a) -4 evaluation of costs and profit in rayon polygons of Andijan province

Agro-economic indicators for rayon polygons allow evaluating given agricultural production effectiveness as a whole and analyzing dynamics of its particular elements in terms of prices. Net profit was more than 2 times higher in 9 farms and changed insignificantly in 2 farms. Profit was below starting indicator in 3 farms in 2007.

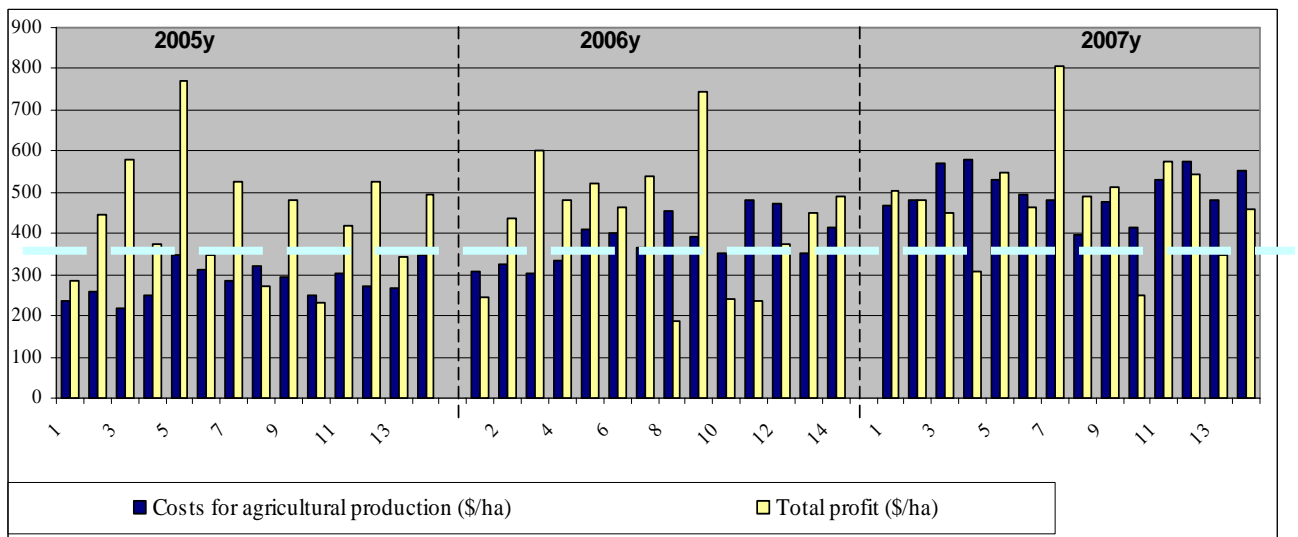
Fig. 5 Evaluation of net profit for cotton in polygons of Andijan province For 2005-2007



Cost ratio for production of growing crops and gained profit is of special interest. If cost and profit variation is analyzed for the last years, it can be see that cotton production costs have been 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 is reduced. Price increase for resources is not in line with purchasing price increase for agricultural production and exceeds considerably that affects total farm profit.

Fig. 6 Evaluation of cost and profit in polygons of Andijan province



b) Train trainers and water managers.

During the period 2006-2008 trainings on effective irrigation water use and methods for land and water productivity improvement were held for polygon trainers in Andijan and Fergana provinces, consultants on agronomy from RAS and TES Centers in Osh province and consultants from AGDP-NAU and CECI in Sogd province in order to up-scale IWRM-Fergana Project experience.

73 persons – from RAS – 7 persons, from TES Center - 6 persons, from ASDP-NAU – 20 persons, from CECI – 10 persons, from BAIS of Andijan province – 14 persons and BAIS of Fergana province – 16 persons were trained through trainings held for trainers and consultants of extension services.

3.3 Establish links with RAS/FOMP and other relevant projects \ national organizations for dissemination and use of guidelines and tutorials.

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

IWRM-Fergana Project coverage of farms through training trainers from extension services

Table 4

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*
Fergana 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, Fergana and Andijan provinces.