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## **End of Phase Report (EPR) of Water Productivity Improvement at Plot Level (WPI-PL) Project**

Structure/ Chapter	Content / Form / Key Questions		
1. Basic Information	<b>Countries Involved:</b> Kyrgyz Republic, Tajikistan and Uzbekistan	<b>Water Productivity Improvement at Plot Level</b>	
	No SAP : 7F-xxxxx.xx		
	Domain SDC: (e.g. RC, CEE, HA, GC)	<b>Sector / strategic domains (HA) according SAP:</b>	
	Domain of intervention / component of Cooperation Strategy:		
	<b>Enhancing water productivity, crop yields and yield stability at plot level through improved on-farm water management</b>		
	Start of Project 1st : 1st April, 2008	Scheduled duration: 11 months (28th February,2009)	
	Start of the current phase: 1 <sup>st</sup> March, 2009	End of the current phase:31 <sup>st</sup> December, 2011	
	<b>SDC budget in Swiss Francs for the current phase according to Credit Proposal:</b> 2,407,085		
	<b>Accumulated SDC budget in Swiss Francs of previous phases:</b> 600,000		
	Information on partners and/or other donors contribution (calculated in Swiss Francs): NONE.		
	<b>Implementing Organisation(s)</b> : Scientific Information Center of Interstate Commission on Water Coordination (SIC-ICWC)and International Water Management Institute (IWMI)		
	<b>Main National Partners</b> : Kyrgyz Water Committee, Ministry of Melioration and Water Resources of Tadjikistan and Ministry of Agriculture and Water Resources of Uzbekistan	<b>Main International Partners:</b> None	
	<b>Sources of information for the EPR:</b> Project Log-frame, Project document, Yearly Plan of Operation and Project Annual Progress report		
	Written by (Name of Author(s) / Organisation): Dr. Shukhrat Muhammedjanov (SIC-ICWC) and Dr. Mohan Reddy Junna (IWMI)		
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## 2 Outcomes achieved (max.2 pages)

### 2.1. Description of intended and unintended effects (outcomes/ if possible impact):

The Water Productivity Improvement at Plot Level Project (WPI-PL) contributed to enhanced water productivity, crop yields and yield stability at plot level through improved on-farm water management. The project strengthened the capacity (in terms of knowledge generation and dissemination) of the different actors in the agricultural innovation system through strategic partnerships for dissemination of sound and adapted extension messages relating to water productivity improvement at plot level to farmers. The project developed strategic alliances with national partners in the three countries that are interested in generating, translating and disseminating agro-technical and hydro-technical knowledge and experience from the IWRM and other development projects. Project activities followed the different steps of the innovation cycle for developing and disseminating relevant technologies, by constantly improving and adapting technologies and extension materials according to the systematically collected feedback from the end-users, the farmers.

Over the past period, from 2008 to 2011, the WPI-PL project has achieved apparent successes. Based on the elaboration of IWRM-Fergana project, the WPI-PL project was able to identify the main ways of solving the problems hindering improvement of land and water productivity at field level. In all three countries, the project has established a mechanism for operative assessment of the situation in irrigated agriculture and transfer of innovative solutions through the relationship of different institutions. The project was successful in attracting the interest of water users to apply these innovations, which laid the basis for the economic benefit of water users. Due to the efforts of the project, a basis was created for the design and development of the mechanism of interaction between the water users and the WUA, attracting the WUA key specialists as consultants. The system based on continuous monitoring makes the use of specialists efficient not only to farmers, by eliminating their shortcomings and mistakes through the consultations, but also for the WUA by adjusting the water supply schedules.

In general all involved actors understand their role in innovation cycle very well. During meetings and discussions with all participants of the innovation cycle all actors in three countries pointed out positive impact of the approach.

Through implementing of innovation cycle project partners have prepared questionnaire and assessed needs of farmers and thematically prioritized and transferred to research institutes. Generalizing all the information received from our partners, we can draw a general conclusion that the majority of the needs and requirements of farmers at the moment comply with previously identified issues. Needs of farmers at field level can mainly be summarized as follows: water distribution issues among water users is random; each water user uses irrigation water in his/her sole discretion, without control, without any discipline, agreement and order. Organizations planning water supply devoided the ability to control time and the amount of supplied water; water users are unable to receive water on timely manner and in required amount, this is especially affecting water users located downstream not only within the channel, but also within offtakes.

Based on needs of farmers 19 recommendations and technologies were identified that can be used for wide dissemination among farmers.

A Strategic action to implement the innovation cycle in each country is based on the interaction of four key actors in this process. However, the approaches to ensure sustainable mechanisms for the successful implementation of the innovation cycle are different and depend on prevailing conditions in the agricultural and water sector in each state. In Tajikistan, and Kyrgyzstan, the general organization of the task implementation of the project has been brought to the following: disseminating organizations organize a system of water accounting at the demonstration fields, and for all interested farmers. Based on the water measuring devices constructed on their lands the training of farmers were conducted not only on water measuring, but on calculations and record keeping on water received from the WUA or Rayvodhoz. Information Center ensures supplies necessary for training and in collaboration with the Institute prepares forms for record keeping. Provincial Project Manager, at the same time as the representative of BISA, provides the legitimacy and implementation, by the WUA and District Water Management Organization, of water accounting system with farmers and payment for the volume of water received as well as approval and legal registration of all documentation related to water measuring and payment. Organization of a system of water accounting for farmers is the first step in the overall strategy. The second step is the continuous actions of the disseminators and all other project participants in working with farmers consisting of increasing farmers' knowledge on all issues related to irrigation and the use of water received. Further, based on the resulted trust of the farmers to the representatives of the project, the deepening of their knowledge through consulting and training based on their requests is carried out. The only difference between these two countries is the impact mechanism at farm level. In Kyrgyzstan, all of the above is carried out through the interaction of WUA and the offtake leaders on the tertiary canals taking into account very small size of parcels; in Tajikistan - through WUA and dekhkan farm chairmen. In Uzbekistan, everything is based on the work of two key WUA specialists: agronomist and hydrotechnician. This system provides for the organizational work not only to create a system of consultation and dissemination of knowledge and technologies at the WUA for farmers, but also to improve the structure of WUA and its performance. Both structures form an integral unit and a working system at the WUA, one unit is closely linked with another and therefore the success of the two structures depends on the effectiveness of their mutual and coherent work.

The knowledge and technologies dissemination system is based on training of trainers and farmers as well as preparation and distribution of the materials in a form of bulletins and brochures. Monthly agro-ameliorative bulletins and recommendations in the national languages are extended among farmers. Demonstration fields have been selected and equipped.

Farmers in all three countries emphasized the importance of the project in providing consultations, training and distribution of materials, their usefulness and multifaceted character, since crop cultivation is a complex process.

Farmers also stressed the importance and urgency of some issues and topics discussed with them; those were needs of the time and were characterized by seasonality. The outcome analysis showed that advisory work carried out with farmers does bring good results. If at the beginning of the project the interest of farmers to water issues were only about 10-15% , then by 2010, after the project started, farmers' interest in water issues ranged from 60 to 70%, 20-25% of the issues are on farming techniques, and 5% relates to the legal and economic issues. In the water issues, farmers' greatest interest are often the irrigation regime, water measuring and technological irrigation scheme.

In Uzbekistan and Tajikistan, farmers support the involvement of experienced and recognized agronomists in the WUA staff. In Tajikistan, farmers realized that in order to increase profitability it is necessary to introduce volumetric water charges for irrigation water used and 25 farms announced the installation of the WFM; farmers began to trust the recommended agro- and hydro-technologies and trainers' advices. In Kyrgyzstan, the partners note the high interest of farmers in the mechanism of management of irrigation water within small areas and payment based on the volumetric water used. As a result of this method implementation, farmers started to pay more attention to the duration of irrigation, the technological irrigation scheme, the possibility of reducing water consumption, irrigation period and the number of irrigations. Independent consultant survey results indicated that all farmers in project area reported that water productivity increased in intervention zones.

Within the framework of the scientific part of the project, the partners additionally looked for their research, design and advisory materials available and in other organizations. In Kyrgyzstan, Kyrgyz Research Institute for Irrigation sought and selected materials that met farmers needs in the field of irrigation water use. The collected material helped to develop additional 10 recommendations. In Tajikistan, Tajikgiprovodkhoz, taking into account farmers needs and demands, prepared 14 additional materials with the use of its own resources and passed them to SOF in the form of brochures meant for distribution. In Uzbekistan, in SANIIRI archives they found more than 50 materials on efficient use of irrigation water, irrigation techniques and their parameters.

An analysis of national reports shows that national partners agree on one opinion that climatic conditions in recent years have had a significant impact on the crops and significantly hampered the necessary measures implemented on farms. These years are characterized with high humidity, heavy rainfall and low air temperatures during spring. The Project organized system of knowledge and technology transfer is becoming increasingly important. Due to the advice and the application of the proposed recommendations farms have not only managed to save water and land productivity, but also to improve this figure. If at the beginning of the project water productivity of farms in the range was 0,3-0,4 kg / m<sup>3</sup>, then in 2010 this figure on the project objects amounted to an average of 0.8 kg / m<sup>3</sup> in Uzbekistan, 0,7 kg / m<sup>3</sup> for Tajikistan and for Kyrgyzstan in the range 0,8-0,9 kg / m<sup>3</sup>.

Based on partnerships of various structures of the water and agricultural sectors, a system of innovations included the organization of works based on farmers needs assessment, search and development of the technologies, training of trainers and technology transfer to farmers. The results of two years of the project in this cycle demonstrate the validity of the chosen system proposed by the project document. The only possible way to perform the innovation cycle is the close interaction of various structures: research institutes, information centers, disseminators represented by operational services and NGOs, and farmers as consumers of innovation and success indicators for the entire system of innovation and partnership. The project formed the system of identifying and assessing the needs and problems of farmers, developing solutions to these problems and processing of those; mechanisms of knowledge transfer to farmers and their effective interaction with all actors of the innovation cycle are being worked through.

Results of the project attracted interest of farmers outside the project area as well as WUA specialists. In Uzbekistan, in addition to training sessions organized for farmers located in the project area, regional implementers, at the request of local administrations of the districts provided trainings and dissemination of recommendations for farmers outside the project area. In Kyrgyzstan, the recommendations developed under the project have been adapted in Chui region, located in area with similar to Osh soil and climatic conditions. Other projects also express their interest in the project. Projects specialists of RESP2, SEP, USAID and GTZ visited the WPI-PL project demonstration fields, where they were presented with all the developments and approaches. Recommendations on the efficient use of irrigation water and agricultural issues that have been developed under the project and monitoring forms for demonstration plots and neighboring farmers were given to project RESP II, which operates in 7 regions of Uzbekistan, and the SEP project which operates in three regions of Kyrgyzstan.

The monitoring results clearly indicated that WPI-PL project has vital impact at plot level. Changes occurred in terms of measuring water, irrigation water saved, and farmers report on higher yields, conflicts related water allocation decreased and neighbour farmers indirectly profit from the project, since they also report on few conflicts.

c) An approximate analysis of costs/benefits of achieved outcomes: are the inputs reasonable in relation to the results achieved?

Minimal farmers' profit received under the project for three years for cotton makes within 690\$/ha, average profit before the project implementation makes 419\$/ha, for wheat 456\$/ha and 201\$/ha respectively. Difference between these values gives estimated benefit created by the project at the farm level equal approximately in monetary expression per ha for cotton 690\$/ha-419\$/ha=271\$/ha, for wheat 456\$/ha-201\$/ha=255\$/ha, the sum of these values multiplied by the total project coverage area 13,147 ha gives estimated benefit created by the project at the farm level equal approximately 6,934,000\$ minus the amount allocated for the project implementation, and net benefit of the project is equal approximately for three states 4,815,000\$

## 2.2 Transversal themes (Gender and one additional transversal theme):

WPI-PL project team has not separated equality of men and women in intervention zones. Project conducted training equally for men and women.

Insignificant shift appeared to be in minds, firstly, of men regarding a social status of women. And this is the brake in the future. The actual situation is that women's activity is rising and the number of women-farmers is increasing.

The project renders feasible help to women-farmers who showed most activity in gaining knowledge in comparison with men. For Central Asian region, woman's leadership is not typical, to date the existing situation made women to apply more efforts meanwhile bearing the full brunt of housekeeping and trying to solve successfully issues which were of men's prerogative. Taking into account this statement, the project is resolving this contradiction between dictates of the time and mental considerations by supporting active women, conducting trainings, increasing educational level of women, their professional and juridical knowledge.

## 3 Outputs and performance, partners and context (1 to max. 1.5 pages)

### 3.1 Summary of main outputs / outreach

The project identified and systemized farms' problems and needs related to water productivity improvement at plot level. Technologies were developed taking into account farms' problems and needs at plot level. Approaches and mechanisms for water management at plot level were identified and worked out, training and dissemination materials were elaborated, effective target technologies intended to improve water and land productivity at plot level were transferred and adapted. Organization of water accounting systems developed and proposed mechanisms for effective water management at plot level.

WPI-PL project has covered 713 farmers in 816 ha in Kyrgyzstan, 96 farmers in 4547 ha, in Tajikistan and 155 farmers in 7784 ha, in Uzbekistan. Project prepared training materials broadly disseminated in the form of guideline, brochure, article, poster and etc. The outputs of the project are being scaled up. All the extension materials of WPI-PL project are being used currently in the project area of RESP-2 project. In addition, the WPI-PL project partners in Uzbekistan are involved in capacity building of disseminators in the RESP-2 project area.

In Kyrgyzstan the WPI-PL technologies have the biggest outreach because of the complementing project of Helvetas: 16 partners (8 NGOs and 8 WUAs) of SEP Project (Efficient Use of Water) are using WPI project materials in their activities at the moment in the Southern regions of Kyrgyzstan. The project has reached up to now approximately 10'000 farmers. Also the government supported WUA Support Units use materials of WPI when training other WUAs who are not involved in activities of the project. These two 'distribution channels' allow a wide dissemination of WPI project ideas, knowledge and technologies outside of the project area.

As the information center and disseminators in Tajikistan are NGOs who are specialized in agriculture, they are broadly using materials of WPI-PL for the trainings of other farmers under other project mandates. By this they contribute to the development of the agricultural sector of Tajikistan.

### 3.2 Efficiency (In terms of budget)

*Total funds for the implementation project in its current phase II consist of 2,118,915.38 USD including 288,873 USD for Kyrgyz Republic, 307,436.33 USD for Tajikistan, 383,516.05 USD for Uzbekistan, 589,074 USD for SIC, ICWC and 550,016 USD for IWMI. All planned funds have been used according to the project plan of activities.*

### 3.3 Contributions (of stakeholders)

*Actual contributions of participating countries vs. planned contributions consisted of following: Kyrgyz Republic – 110,200 USD/60,000 USD; Tajikistan – 125,729 USD /55,000 USD; Uzbekistan – 360,000 USD /200,000 USD, Actual contributions of IWMI and SIC vs. planned contributions consists of following accordingly: 180,000 USD /165,000 USD and 136,500 USD/120,000 USD.*

WPI-PL project stakeholders are contributing significantly to achieve project results. All partners research institutions, information centres, disseminators and farmers actively involved in dissemination knowledge to maximum extend to other projects and farmers.

In terms of contributions by all those involved in the project, water users have contributed 22% of all costs against 78% provided by the project. This suggests that water users are willing and able to take collective action and jointly bear the costs of solving their water distribution issues in their respective canals.

### 3.4 Transformations of context

During the project implementation in order to solve problems at farm level, within the frameworks of WPI-PL, some issues which go beyond the mandate of the project were revealed. In order to solve direct problems at farm level, the project had to assess and search solutions at WUA and rayvodkhoz levels. Due to WPI-PL, importance of considering problems at WUA level in bottom-up manner was identified, this practically changed viewpoints of many approaches regarding solution of both farm problems and WUA ones. It was ascertained that for effective

irrigation water management at plot and farm levels and preparation of effective proposals for these levels, it is important to know and assess shortcomings in water management and distribution at WUA level which cause problems at plot level, namely to adjust the fixed normative proposals taking into account created problems at WUA level and upper. The second issue that influenced significantly on changing the project context was equipping farms with hydroposts and construction of drip irrigation system at demonstration plots. These two issues initially were not stipulated in the project document. It should be noted that equipping farms with hydroposts within base WUAs of WPI-PL project allowed the project to change radically attitude and viewpoints of farmers and WUA specialists regarding water use management at both WUA and farm levels. The solution and strategy for more effective organization of water use management and closer interaction of the two levels – WUAs and farms (water users) are built and seen exactly through equipping each water user and organizing a water accounting system at all water delivery points.

To improve water distribution and use management system at WUA and farm level, it was decided to equip all offtakes in farms with water flume meters and regulating structures within the base WUAs covered by WPI-PL and IWRM projects. Within the WPI-PL project frameworks, based on equipping, irrigation water accounting system was organized at the borders of all the farms, which allowed forming the basis for effective water distribution at WUA level. Yet, it enabled to introduce volume-based water accounting. In Uzbekistan, equipping of offtakes within the farms of WUAs is practically completed, out of planned 385 units (hydroposts and regulating structures) 364 units were constructed, the rest quantity will be constructed to the end of the growing season. In Tajikistan, out of planned 124 units (hydroposts and regulating structures) all units were constructed. In Kyrgyzstan, out of planned 173 units (hydroposts and regulating structures) to date 47 units were constructed. Construction of the rest of water flume meters and regulating structures is planned to be completed up to the end of the year. Also, at whole this impacted mitigation of social tension and liquidation of conflicts at farm and WUA levels.

Within WPI-PL project, in order to demonstrate water saving technologies for improved watering management at plot level, SDC initiated construction of drip irrigation system. For construction, the following farms oriented on orchard crops and located in water deficit zone with deteriorated conditions for water delivery were chosen: farm “Akbar Ali Fayz” (10 ha with apricot, cherry, peach) and farm “Progress Shavkat” (5 ha with cherry, peach) within WUA “Khirmoni Aziz” in Fergana district, Fergana oblast; and farm “Damgul Dastasi” (25 ha with vineyard) in Kasansay district, Namangan oblast. The total area of the constructed drip irrigation system is 40 ha.

## 4 Lessons learnt (1 to max. 1.5 pages)

Water productivity can not be achieved only through hydro knowledge it should be complemented with agronomic knowledge. The innovation cycle is a new mechanism, which has not strengthened yet. It should be strengthened further. Moreover following issues were identified as major constraints for improving water productivity on farm level.

- Lack of established links between the levels of water hierarchy (outside IWRM and WPI-PL projects);
- Lack of legal and economic (financial) mechanisms for interaction between WUA and farm, based on economic incentives
- Low-skilled WUA specialists and lack of WUA staffing;
- Lack of sustainable and developed water delivery system (outside IWRM project);
- Low level of farmers’ knowledge.

*During the second phase, WPI-PL project faced with the farms’ problems, which solutions are beyond the project activities (except IWRM-Fergana project area). The project identified issues having an inhibitory effect on achievement of water and land productivity improvement at plot level. It was identified that besides shortcomings and mistakes which are made by farmers and concerning technological aspects, issues connected with incorrect or insignificant organization of a water delivery system from the side of water supplying organizations have considerable impact. WPI-PL project made first steps towards solution of these problems, the project organized equipping all farms with hidroposts within its pilot WUAs, organized a water accounting system on the borderline of each farmer, carried out works on WUA required staffing (agronomists, mirabs for each canals within WUAs). The project had to solve these issues as without resolving the latter the issues of effective irrigation water use at plot level became more problematic.*

The project experience showed that separate activity of different organizations in water and agricultural sectors did not enable to bring their products (services) to end-users (farmers). Innovation cycle established by the project allowed joining these separate organizations into a single communication chain, and thereby their activities and materials were enriched mutually. The system established for interaction of different organizations enabled to link structures separate from each other and initiate development of effective technologies on water productivity and their transfer to users, and above all this interaction system involved farms into the process of innovation system and innovation cycle. Involvement of state structures in this system (Ministries, research institutes, BISAs, regional water management organizations and WUA Support Units) and their closer cooperation with NGOs gives strong reasons for sustainable work of this process. This process will be most sustainable if its basic steps which stipulate development of mechanisms for interaction of these structures and creation of favourable conditions are solved. Success of further activities and sustainability of solutions made by the project will depend on work of the established innovation partnership system which requires its continuous gradual development, strengthening and governmental support as well.

These objectives are identified as priority, and the strategy of further project activities is built on basis of the objectives. At the current stage, it is important to direct efforts of the project to development of mechanisms for strengthening interconnection between the two levels – WUAs and farms. Mechanisms should have not only engineering, technical and organizational character, but they should include legal and economic mechanisms. And all these issues (mechanisms) should be interconnected and mutually complementary, and sequent each another.

### **4.3 Replicability and scaling up**

In all the countries of the project zone, government structures represented by Ministries are interested in the project approaches for solution of problems in water and agriculture sectors. Development and completion of the developed specific approaches for each country and mechanisms for working of the innovation cycle will give the ground for their wider and more sustainable application in future by government of each state. However, since the entire process of the innovation cycle is transparent, the innovation cycle is replicable. The outputs of the project are being scaled up. Thus, today in Kyrgyzstan, the Water Resources Department, at the instance of the Chuy and Batken oblasts Administrations, is planning to use the project approaches. Besides, WPI-PL approaches and recommendations are being used through project financed by various donors - Helvetas, OSCE, UNDP/EU, World Bank. In Tajikistan, the project materials and approaches are being used in Khotlon and Kurgantepa oblasts through different local and international organizations (AGRICULTURAL TRAINING AND ADVISORY CENTRE (ATAC), USAID WUASP), and Isfara project in Sogd oblast. In Uzbekistan all the extension materials of WPI-PL project are being used currently in the project area of RESP-2 project. In addition, the Uzbek partners of WPI-PL project are involved in capacity building of disseminators in the RESP-2 project area.

### Logical Framework of the WPI Project

Narrative	Objectively Verifiable Indicators	Sources of Verification	Assumptions	Achievements
<b>Project goal</b>				
Enhancing water productivity, crop yields and yield stability at plot level through improved on-farm respectively on-plot water management, thereby avoiding negative impacts on the environment such as water logging and salinization.	Water productivity, yields and their stability at field level are improved	Report on activity A5.4	Institutional and economic framework conditions allow farmers to implement water productivity enhancing technologies	Report on 5.4 activity submitted in project annual reports and there are significant improvements on water productivity and farmers incomes increased due to WPI-PL project.
<b>Project objective</b>				
To strengthen the capacity (in terms of knowledge, extension material and methods) of the different actors in the agricultural innovation system through strategic alliances for conveying solid and adapted extension messages relating to water productivity improvement at plot level to the farmers.	<ul style="list-style-type: none"> <li>▪ New innovation cycles are implemented on a continuous basis, both to ameliorate already tested innovations (following ER4) and to disseminate further technologies * number of technologies for which adapted extension material is available (min. 40?)</li> <li>▪ Project activities in 3 areas per country</li> <li>▪ Training of trainers (TOT) are performed outside pilot areas * farmers outside project area receive adequate advice on water/irrigation management</li> <li>▪ Project partners feel confident and competent with the hydro-technologies and know how and where to get required information regarding hydro-technologies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Annual reports</li> <li>▪ Survey results (A6.2)</li> <li>▪ Annual reports</li> <li>▪ Survey results (A6.5)</li> </ul>	National extension/ dissemination partners find ways to finance production and dissemination of extension material inside and outside the project areas	Proposed innovation cycle has successfully implemented in three countries. Independent survey conducted by Helvetas consultant according to activity 6.2 and report submitted to SDC. In addition project partners also evaluate project implementation and successful and non-successful actions of the project
<b>Expected Results</b>				
ER1: National partners are identified, structural and personal links are established, and mode of cooperation is established.	<ul style="list-style-type: none"> <li>▪ National Project Implementation Teams are established</li> <li>▪ Modes of cooperation are clarified, locations of project activities and possible additional (local) project partners are identified</li> <li>▪ Local 'councils' ('soviets') for exchange and coordination are established</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minutes of 1st NPITs meeting</li> <li>▪ Minutes of 1st NPITs meeting, YPO</li> <li>▪ Minutes of 1st council meetings</li> </ul>	Suitable project partners can be found and are willing to cooperate in the project	Institutional structure, which consist of research institute, information center, disseminator, farmer has been established in each country.



<p>ER2: Partners in the innovation system have commonly revisited/identified the needs of farmers and analyzed them in view of matching them with known approaches and technologies to increase WP in order to select the ones that can be disseminated and others requiring adaptive research.</p>	<ul style="list-style-type: none"> <li>▪ Previously carried out assessments of farmers' needs are analyzed (stratified analysis, focus on water management)</li> <li>▪ Stratified needs assessment focusing on water management at plot level and targeted to identified knowledge gaps is carried out and analyzed ♦ in each project area (3x2)</li> <li>▪ A number of technologies, which correspond to farmers' needs and at the same time can contribute to improving water productivity, are identified to focus on (for dissemination or adaptive research)</li> <li>▪ Farmers' innovations regarding water management at farm/plot level are identified</li> <li>▪ Technologies are selected that can feed directly to extension (ER3&amp;4) and others where adaptive research is required (ER5)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Report on previous needs assessments</li> <li>▪ Report on targeted needs assessment</li> <li>▪ Report on targeted needs assessment, chapter on farmers innovations</li> <li>▪ Available extension material and research reports</li> </ul>	<p>Farmers' needs can somehow be satisfied with advice that is related to improved water management at farm/plot level</p>	<p>Farmers needs assessed through developed questionnaire by project partners and systematically prioritized continuous basis.</p> <p>19 technologies have recommended to farmers for wider application and farmers innovation have been documented for adaptive research such as rice furrow irrigation, water application to the field through magnetic zone and etc.</p>
<p>ER3: A first set of known/researched technologies are translated into a farmer-friendly language, are available for dissemination (e.g. for ToT to national partners, and a well-selected variety of trainers is trained to carry out dissemination to farmers.</p>	<ul style="list-style-type: none"> <li>▪ Extension/training material for selected technologies to improve water productivity at plot level is developed, satisfying farmers' needs under different conditions ♦ number of extension/training materials developed</li> <li>▪ ToTs have been carried out in project areas ♦ min. number of trained trainers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Extension/training material</li> <li>▪</li> <li>▪ Annual reports</li> </ul>	<p>Trainers fulfilling the requested criteria (e.g. experience in extension methodology and agronomy) can be identified in each country</p>	<p>Extension materials in the form of brochures, guideline, bulletins and poster have been prepared and widely disseminated among farmers. List of materials were attached to annual reports of project, which were submitted to SDC</p>
<p>ER4: Satisfaction of farmers with the provided training/advice is evaluated in two pilot areas in each of the three countries.</p>	<ul style="list-style-type: none"> <li>▪ Selected technologies to improve water productivity at farm/plot level have been disseminated by ToTed trainers in pilot areas together with corresponding agro-technical messages ♦ min. number of farmers reached</li> <li>▪ Adoption of technologies and satisfaction of farmers with the advice provided within and outside pilot areas is evaluated ♦ 75% satisfied</li> <li>▪ Success and failures regarding the dissemination are analyzed and technologies, messages, extension approaches, extension material or ToTs adjusted accordingly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Report on surveys (A4.2 &amp; A4.3)</li> <li>▪</li> <li>▪ Report on survey (A4.2 &amp; A4.3)</li> <li>▪</li> <li>▪ Annual reports</li> <li>▪</li> <li>▪ Annual reports</li> </ul>	<p>Dissemination partners make use of the elaborated extension material within and outside the project/pilot areas</p>	<p>Independent survey conducted by Helvetas consultant according to activities and report submitted to SDC.</p>

	<ul style="list-style-type: none"> <li>Further needs of farmers are documented and analyzed, and corresponding technologies related to improving water productivity at farm/plot level are selected for dissemination or adaptive research</li> </ul>			
ER5: Adaptive research to evaluate the suitability of technologies proven successful under different environments is carried out (e.g. on financial viability, labor aspects, gender viability)	<ul style="list-style-type: none"> <li>Technologies are validated for site- and location-specific conditions through desk studies and/or on-farm farmer-managed adaptive research + extension material for 'doubted' technologies is being developed</li> <li>Research institutions know important topics to work on</li> <li>Viability of farmers' innovations in water management at farm/plot level is evaluated and those with potential for wide dissemination are processed and form part of ToTs</li> <li>Impact of the WPI project on water productivity and yields at field level is evaluated + yearly data from min. xx farms within and yy farms outside pilot area</li> </ul>	<ul style="list-style-type: none"> <li>Reports on research projects and additional extension material</li> <li>Communications to research institutions</li> <li>Reports on research regarding farmers' innovations and additional extension material</li> <li>Report on development of yields and water productivity</li> </ul>	Further technologies can be adapted to match the specific conditions in the project areas	Technologies proposed by research institutes in each country thoroughly reviewed and some of the technologies which need adaptive research addressed by project partners. Impact of WPI-PL project on water productivity and yield improvement have been reported to SDC in project annual reports.
ER6: Knowledge on technologies to improve water productivity is anchored within national partners, a system that continuously assesses farmers' needs and elaborates corresponding extension messages is established, and reach of spreading technologies improving water management at farm/plot level is widened.	<ul style="list-style-type: none"> <li>New innovation cycles are implemented on a continuous basis, both to ameliorate already tested innovations (following ER4) and to disseminate further technologies + number of technologies for which adapted extension material is available</li> <li>ToTs are performed outside pilot areas + farmers outside project area receive adequate advice on water/irrigation management</li> <li>Project activities are carried out in 3 areas per country</li> <li>Project partners feel confident and competent with the hydro-technologies and know how and where to get required information regarding hydro-technologies</li> </ul>	<ul style="list-style-type: none"> <li>Annual reports</li> <li>.</li> <li>.</li> <li>Survey results (A6.2)</li> <li>.</li> <li>Annual reports</li> <li>.</li> <li>Survey results (A6.5)</li> </ul>	Innovation cycle encourage actors in the agricultural innovation system to commit themselves further to achieve the project objective	Independent survey conducted by Helvetas consultant according to activity 6.2 and report submitted to SDC. In addition project partners also evaluate project implementation and successful and non-successful actions of the project

## ABBREVIATIONS

WUA	Water Users Association
ADB	Asian Development Bank
BISA	Basin Irrigation System Authority
ER	Expected Results
YPO	Yearly Plan of Operations
WUG	Water Users Group
DH	Dekhan Household
IAC	Irrigation and Agricultural Consulting (Tajikistan)
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
IWRM-Fergana	The Integrated Water Resources Management in Fergana Valley project
IC	Information Centre
S	Stakeholders
KSRII	Kyrgyz Scientific and Research Institute of Irrigation
ICWC	Interstate Commission for Water Coordination
MAWR	Ministry of Agriculture and Water Resources of Uzbekistan
MIWR RT	Ministry of Irrigation and Water Resources of the Republic of Tajikistan
MAWPI KR	Ministry of Agriculture, Water and Processing Industry of the Kyrgyz Republic
MTP	Machinery and Tractor Center
SRI	Scientific Research Institute
NM	National Manager
NPCC	National Project Coordination Committee
PSC	Project Supervisory Committee
CPM	Country Project Manager
SIC	Scientific Information Centre
WUA-SU	WUA Support Unit
SO	Social Organization
FFS	Farmer Field School
PD	Project Document
WPI-PL	Water Productivity Improvement at Plot-Level
WP	Water Productivity
RAS	Rural Advisory Services
SANIIRI	Central Asian Research Institute for Irrigation
CECI	Centre Canadien d'Etude et de Coopération Internationale
SDC	Swiss Agency for Development and Cooperation
CA	Central Asia
ZOKI	Advisory Training and Information Center
RAMWR	Regional Administration on Melioration and Water Resources