

The End User of Water and the Extension Service for Farmers

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Depending on vectors of the agrarian policy, reforms in the agrarian sector have specified the different economic environment for developing agriculture in Central Asian countries. For example, in Kyrgyzstan, the agricultural lands have been completely transferred for private use in the form of small plots under the absolute self-determination of directions in agricultural activity. In Uzbekistan, private farms were established based on the long-term land leasing with the state order on crops and fixed prices on agricultural output specified by the state. In Tajikistan, the collective farms are mainly kept and only some private farms are being established; and although there is not the formal state order on crops, at the same time, farmers cannot manage their plots and output at own discretion.

However, in spite of different ways selected for reforms, all three republics face the similar problem due to the reforms implemented. Prior to reforms, all large collective farms were managed by a chairman and specialists (agronomist, irrigator, economist etc.) with higher education in agriculture. All farm operations were implemented under their direction; and common agricultural workers only executed their instructions. Now, each peasant himself manages all processes on small areas; and the key problem is the lack of necessary knowledge within the required norms (soil treatment, fertilizer application, pest control, irrigation methods and land reclamation practice etc.). Moreover, peasants face problems related to legal and economic aspects. All this adversely affects crop productivity and profitability. The governments keep track, somehow or other, these problems; but decisions made for their solving are not yet effective. At the same time, under solving the existing problems each country proceeds from own economic and political conditions and interests.

Monitoring conducted in the frame of the project over territories belonging to three republics in the Fergana Valley has shown that private farms differ in areas of allocated plots and in crop patterns. In Uzbekistan, private farms having the sown area of ten hectares and more cultivate mainly cotton and winter wheat because the state order in force does not allow farmers to select crops independently. A set of crops is more diverse in Tajikistan and Kyrgyzstan. Small plots allocated to farmers in Kyrgyzstan do not allow them to manage their agricultural production efficiently and gain good profit. There is more complicated situation in Tajikistan where dekhkan farms were created. Here, the members of dekhkan farms have practically no voting right and do not participate in the decision-making process, being only a labor force under subordinating to the director of the dekhkan farm.

In spite of some differences in reforming the agricultural sector, the overall situation of helplessness is typical for farmers in these countries. After receiving their plots but without infrastructure developed for new conditions, farmer faced the need to solve financial, legal, technical and administrative issues but most of them never solved these problems in the past. Under considering the process of restructuring the agricultural sector and establishing the private farms in each country, the community of problems, on the one hand, and specific differences, on the other hand, become obvious and understandable.

In 2002, some shortcomings in agricultural activity in private farms were revealed in the course of monitoring at the demonstration sites that was conducted in the framework of the IWRM-Fergana Project. The low efficiency of irrigation water and land use was marked practically in all farms under studying in the region. Total losses of irrigation water on the field (deep percolation and surface releases) reach 55% of irrigation water supply at a field border and exceed the normative values 1.5 to 2 times. Water productivity in some farms amounts to 0.14 to 0.19 kg/m³.

Our field survey of the irrigation and agricultural practice has shown that the key factors of decrease in land productivity, apart from the lack of inputs and machinery, are low professional skill and non-normative use of all resources, although farmers in the territories belonging to three republics in the Fergana Valley did

not mention the low level of agricultural knowledge. The fact is that the farmers, even those who worked long time in former collective farms and state farms and participated in different farm works, including water applications, have carried out only instructions of an agronomist, irrigator or skilled foreman. At present, a farmer himself should solve all issues because he does not have “consultants” as before. A less skilled farmer tries to make his job in the manner employed by his more skilled neighbor or asks an advice of the elders. However, as our study has shown, most of farmers make considerable mistakes in the process of cultivating crops. Most of farmers cannot correctly specify the terms for water applications or select the correct technological pattern for irrigation resulting in difficulties with water distribution over their fields and overwetting of some sites and insufficient wetting of others; at the same time practically all farmers use the overrated water application norms. Most of farmers do not have technical knowledge on natural factors and specific land conditions within their farms that needed to be accounted under planning water applications. Apart from the irrigation practice, most of problems are related to the lack of any knowledge on norms and terms of fertilizer applications, pest and crop disease control. Phosphate fertilizers are not practically applied in Tajikistan and Kyrgyzstan in spite of an insufficient content of phosphates in soils. Application of nitrogen and potash fertilizers is not timely and does not meet the required norms. Based on analysis of collected data it is necessary to note that private farms, lacking any state support, have a lot of problems of technical and organizational nature. Key problems faced by farmers in the process of their agricultural activity are similar to problems that are revealed at the demonstration sites. First of all, it is necessary to note the following problems:

- irrigated water supply does not meet the established norms;
- ill-founded terms of water applications;
- incorrectly selected technological schemes of water applications (too long furrows and often water application along the full length of a field);
- incorrect selecting the sorts of fertilizers and rates of their application; and
- lack of knowledge on pest control and preventing crop diseases.

Based on assessment and analyzing of data collected in the process of monitoring, the project consulting team has prepared the recommendations on improving the land and water productivity. Since 2003, the project executors attempted to manage the agricultural production based on these recommendations. As a result of the project activity and impacts on all components of the agricultural production, the situation was changed. In 2003 and 2004, overall productivity at the demonstration sites has increased ranging from 0.29 to 1.4 kg/m³ over farms. During these years the increase in overall productivity amounted to 21 to 135% in comparing with 2002, including reducing irrigation water consumption by 16 to 83% and the rise of crop yield by 11 to 72%. Analyzing the actual use of irrigation water shows that most of farms have the real possibilities for improving the efficiency of water use. Increase in the efficiency can be provided without considerable investments into interventions at the field level and planning water distribution at the level of private farms. At that, development of the simplified and understandable methods of planning and use of irrigation water at the field level, as well as dissemination of learnt experience among other private farms are very important.

It is necessary to note that a lack of farmers’ knowledge on correct planning of water use results in considerable lowering the level of their land productivity. To improve water and land resources use at the farm level through disseminating the project experience and introduction of existing advanced technologies, development of the extension service and the training of local consultants are needed.

The experience learnt at demonstration sites in the frame of the IWRM-Fergana Project shows that there are great opportunities for improving irrigation water use and productivity. It is obviously that the training of farmers may result in the considerable improvement of agricultural production. In 2005 and subsequent years, the project activity was aimed at improving farmers' knowledge and introducing the advanced technologies facilitating water saving and increase in land and water productivity. Dissemination of the project experience among farmers was organized through the training and consultation process, as well as by means of conducting the advanced courses for specialist of water agencies and extension services that are servicing private farms. Liaison with the local organizations and extension services, activity of which is aimed at supporting farmers, was established in each province of the Fergana Valley. However, most of extension services render services to farmers only in case of their request. Activity related to consulting services is conducted by organizations having the consulting specialization and by non-specialized state organizations.

In Kyrgyzstan, where the process of reforming is more advanced than in other countries in the region, consulting services for farmers are rendered through the non-governmental organizations financed by the World Bank and the EBRD with partial payment of these services by the government and farmers themselves. In Tajikistan, most of extension services are rendered through the non-governmental organizations financed by international donors. In Uzbekistan, in spite of lack of the institutional framework for rendering rural consulting services, local authorities and organizations under the Ministry of Agriculture and Water Resources monitor timely and proper execution of land treatment and irrigation by farmers.

Regarding above issues, the IWRM-Fergana Project (the Project) established the co-operation with the Rural Extension Service (RES) and the Agricultural Training and Consulting Center (TES Center in Osh). In Tajikistan, the Project cooperates with the NGO "Development Process Supporting Agency NAU" (DPSA-NAU) that during seven years is rendering the agricultural consulting services to local farmers, as well as with the CECI¹ Project funded by the Canadian Government. In Uzbekistan, the decision was made to initiate training activity at the field demonstration sites under the umbrella of the MAWR and to establish the specialized unit in the frame of BISA with functions of the extension service for private farmers.

In 2006 and 2007, the training seminars to disseminate the experience learnt in the frame of project activity were held in all provinces. In addition, the operational manuals covering various project topics, forms for entering collected data into the database, and booklets with the detailed description of all necessary land treatment and irrigation methods were prepared and distributed among the local consultants. Field training workshops for farmers were held by trainers of demonstration fields (polygons) in Andijan and Fergana provinces in Uzbekistan, by trainers of the CECI Project and DPSA-NAU in Tajikistan, and by trainers of the RES in Kyrgyzstan.

At the same time, the promising results were achieved on demonstration fields of the Project in each province. Farmers, on whose plots the demonstration fields were established under supervision of field trainers and local project specialists, used irrigated water according to the recommended norms and received crop yields considerably higher than an average crop yields in neighboring private farms. Water productivity amounted to 0.46 kg/m³ on average, reaching 0.8 kg/m³ in some private farms.

Trainers of the extension services, using the operational manuals and booklets, made the presentations for farmers that covered methods of water metering and accounting and effective technologies of irrigation water use on the fields. Joint activity of local project specialists and trainers of the extension services promoted the farmers' awareness regarding the value of proposed technologies for improving their land productivity and profitability.

Since 2005 until 2007, the following handbooks have been prepared and distributed among local consultants and trainers: "Selection of a technological scheme for irrigations"; "What is the irrigation

¹ CECI – the Committee on Economic Cooperation and Integration

schedule?"; "Specifying the irrigation rate and method for cotton and winter wheat based on the IWRM-Fergana Project's findings"; "Selection of water measuring devices & guidelines on their construction, operation and maintenance"; as well as "The consultative assistance to farmers", comprising the procedures for consulting services based on a visual assessment, questionnaires and surveying private farms. Special forms were drawn up for collecting necessary information, which is used to identify the problems of private farms and to formulate recommendations to farmers. Practical guidelines on water use in private farms, comprising data on daily evaporation and the water metering and accounting methods, was drawn up for specialists and farmers enabling them to schedule irrigations with specifying date and the rate of each water application. In 2007, the handbook "Methodology of work with water user groups having small plots (Case Study of the Sokolok Canal)" was drawn up in Kyrgyzstan.

In 2006 and 2007, the training seminars were held in each province covered by the Project for training trainers and local consultants on topics related to efficient use of irrigation water and the methods for improving its productivity (Table 4.8). 20 trainers of the DPSA-NAU² and 10 trainers and local consultants of the CECI Project were trained in **Soghd Province and** among them **8 field trainers** of the DPSA-NAU who work directly with farmers on the demonstration sites and **5 regional trainers** of the DPSA-NAU who works with field trainers and local specialists. Other 8 participants of the training seminar are specialists-consultants who are employees of the central office developing new technologies and assessing the situation in private farms and at the demonstration sites. Activity of the DPSA-NAU covers five administrative districts: Kanibadam, Spitamen, Matchin, Asht and Zafarabad. Demonstration sites, private farms or the associations of dekhkan farms where trainers of this agency are working were established in each district. The agency cooperates with 76 private farms and the associations of dekhkan farms that encompass the irrigated area of 8,564 ha. Apart from participation in the training courses, the specialists of this agency together with specialists of the IWRM-Fergana Project advised farmers.

² DPSA-NAU is the Developing Process Supporting Agency NAU (Tajikistan)

**Table 4.8. Coverage of Private Farms by the IWRM-Fergana Project
through Training the Trainers**

Name of Province and Consulting Service	Number of trainers and farmers participated in training	Number of private farms serviced by trainers	Area coverage		Total
			Through trainers and farmers	Through Khokimiats & WMO	
Soghd Province					
DPSA-NAU & CECI Project	20	76	8,564		8,564
Private farms	264	264	3,000		3,000
Fergana Province					
BISA & WUA “Akbarabad”	16	240	2,400	3000	5,400
Private farms	605	605	32,457		32,457
Andijan Province					
BISA & “Bulakboshi”	14	210	2,100	3000	5,100
Private farms	800	800	30,218		30,218
Osh Province					
RES	7	200	2,000		2,000
Total	1,726	2,395	80,739	6000	86,739

40 trainers representing the BISA were trained in **Fergana and Andijan provinces**. Each trainer is assigned to one administrative district and serves one pilot site and 15 private farms located around the pilot site. As a whole, trainers serve 1400 private farms in the Fergana and Andijan provinces.

Since November 2007, large-scale activity related to training farmers was conducted by local project specialists in command areas of the pilot canals in Soghd, Fergana and Andijan provinces. Altogether, the

project specialists have served 264 farmers in Soghd Province, 605 farmers in Fergana Province and 800 farmers in Andijan Province. The project encompasses: 5 administrative districts and 26 WUAs with the total area of private farms more than 30,000 ha in Andijan Province; 4 administrative districts and 19 WUAs with the total area of private farms more than 32,000 ha in Fergana Province; and 2 administrative districts and 4 WUAs with the total area of private farms more than 3000 ha in Soghd Province.

7 district consultants representing the RES assigned to seven administrative districts and **10 trainers and specialists** of the TES Center were trained in **Osh Province**. These consultants are engaged in the introduction of new crop varieties and the advanced agricultural technologies at the demonstration sites in each administrative district. They also conduct field training and seminars at the demonstration sites for the neighboring farmers (**up to 20 to 30 farmers**). As a whole, the RES serves about **200 private farms**. Provincial consultants of the RES together with specialists of the IWRM-Fergana Project conduct the field seminars for farmers on the demonstration fields that were established by them.

In Uzbekistan (Andijan and Fergana provinces), apart from activity on the demonstration fields, the trainers are monitoring neighboring private farms. Knowledge acquired at the training courses is the basis for helping farmers to improve their land productivity. In Osh Province, based on knowledge acquired at the training courses and the prepared manuals, the RES consultants provide to farmers the technical assistance related to introducing the water-metering methods and advanced water application technique. *It is necessary to note that if the technique of water applications was learnt quite well by the RES's consultants, planning of water use (scheduling of water applications and specifying of water requirements) remain the topical problem for them.*

Based on the recommendations and manuals developed for specialists and trainers of the extension services with respect to effective use of irrigation water and land treatment, the regional and provincial project executors have prepared and disseminated the booklets for farmers. These booklets were prepared prior to the beginning of each agricultural operation and handed over to farmers through consultants or trainers of the extension services. The booklets were published in local languages; and all their recommendations were presented in the simple manner understandable for farmers. In 2005, the practice of preparing and disseminating the booklets was introduced by the provincial project consultants in selected 20-30 private farms in each province. Farmers have shown interest in booklets, not only those who do not have sufficient experience in agricultural practice but also the quite experienced farmers. Disseminating the project experience through the booklets allowed covering a lot of farmers during short time without inviting them to visit the special training courses.

In 2005, after analyzing the experience of disseminating the booklets, the regional project group together with provincial executors made a decision to extend the coverage of private farms through the dissemination of booklets by trainers of the extension services since 2006. Especially effective dissemination of booklets took place in the Uzbek part of the project area where apart from dissemination through trainers of the demonstration fields, the provincial executors provided the dissemination of booklets among farmers through the Khakimiats³ in the course of monthly meetings in Kuva, Tashlak, and Akhunbabaev districts in Fergana Province. In addition, the monthly dissemination of booklets among farmers in Kuva District was organized through agronomists assigned by the Khokimiat (Table 4.9).

³ Khokimiat is the administrative body (local authorities) of district, city or province.

Table 4.9. Dissemination of Booklets through Existing Extension Services, Local Authorities and Water Management Organizations

Name of province and consulting service	Number of private farms that received booklets	Number of booklets distributed among farmers
Soghd Province		
DPSA-NAU	76	380
CECI Project	72	360
Fergana Province		
BISA & WUA “Akbarabad”	350	1750
Khokimiat	600	3000
Andijan Province		
BISA & “Bulakboshi”	420	2100
Total	1518	7590

Disseminating booklets among farmers was also conducted at the training seminars in the Water User Associations located in the command areas of the pilot canals (the SFC in Uzbekistan and KBC in Tajikistan), see the table below.

Table 4.10. Dissemination of Booklets among Farmers at Training Seminars

Province	District	WUA	Number of booklets distributed among farmers
<i>Andijan</i>	Kurgantepa	Sobirjon suv bulogi	204
		Mashrapboy sahovati	
		Khamraboev sahovati	
	Jalakuduk	Amir Timur	340
		Jalakuduk vodiy imkoni	220
		Pakhtakor gidrotech	216
	Kadjiabad	Chinmakhram	344
		Madiyarov	
		Khodjaobkash	272
		Garagura	
<i>Fergana</i>	Kuva	Tolmazr chashmasy	252
		Musajon Ismoilov	216
		Omad Zilol	276
		Zilol suv fayzi	200
		Polvontosh Bakhor	196
<i>Soghd</i>	Rasulov	Madanyat	132
		Zerafshan	132
		Tajikabad	132
		Samatov	132
Total			3,264

The project experience proves that after reforming the agricultural and water sector in Central Asia, there is the pressing need in establishing appropriate extension services that could assist farmers to solve their day-to-day problems related to agricultural production and water use. At the same time, under establishing the extension services, existing condition and opportunities for development of the agrarian and water sector as well as the status of infrastructure should be taken into account.

The strategy for establishing the extension service. Establishing the extension service as a self-contained agency may be inefficient today due to socio-economic and institutional conditions in all three states and the lack of financial support. Therefore, a more effective way is the establishment the extension service based on or in the frame of existing organizations, activity of which is related to the agricultural and water sector and aimed at the assistance to farmers. What organizations can become the base for developing extension services in the rural area today?

Firstly, the **Provincial Water Management Organizations** (PWMOs), which have not lost their key role in agricultural production, are active in all states whose provinces are located in the Fergana Valley. The PWMOs are planning delivering and use of irrigation water for meeting the needs of agricultural production. Their divisions managing the water use process have links with canal administrations and WUAs as primary agricultural water users. The planning of water use by all primary water users is being annually implemented based on analyzing the crop pattern. Just like water users, the PWMO holds its interest in effective use of limited water resources allocated to the province.

Secondly, **Water User Associations** (single nongovernmental organizations that are operating in the close interaction with land and water users) are intensively developing in the region. Principal activity of WUAs consists in distribution of water among water users based on the water use plans taking into consideration the crop pattern. Due to its activity, WUAs possess necessary information regarding water users: an irrigated area, crop pattern and crop yields, planned and actual amounts of water use, and land condition. Economic capability of water users is important for WUAs from the point of view of collecting fees for water services. In this case, the higher production output and incomes the more opportunities of WUAs to pay the canal administration for water delivered. WUAs hold an interest in effective use of water and land resources and also in awareness of each water user regarding the importance of rational use of water and other agricultural inputs enhancing irrigation water productivity. Specialists of WUAs contact with each water user prior to the growing season at the stage of drawing up the water use plan and during the growing season in the process of water distribution. Somehow or other, specialists of WUAs provides specific advices and recommendations to water users concerning water use and enhancing irrigated land productivity. Establishing the extension services with the staff of necessary specialists (agronomist, lawyer, economist etc.) enables to provide comprehensive consultations to water users regarding all matters of agricultural production.

Keeping in mind the above, the establishing of extension services under the umbrella of the provincial WMOs and existing WUAs is the most practical and effective way in all regions of the Fergana Valley under the sovereignty of three states, may be, with some exception for Tajikistan where WUAs were established over a small part of the country. The fact that these organizations already have specialists in the field of hydraulic measurements and water management speaks in favor of the establishing of extension services under their umbrella, because the lack of specialists is the key problem for establishing extension services independently from a type of department or organization. Although some WUAs in Uzbekistan do not have the complete staff of specialists (sometimes a WUA has only the director and book-keeper) the process of staffing and strengthening WUAs is in progress. The establishing of extension services in the frame of WUAs is the most promising in Kyrgyzstan where practically all WUAs were staffed with necessary personnel and have the experience of planning and water distribution among farmers.