

**KYRGYZ REPUBLIC WATER RESOURCES
AND LAND RECLAMATION DEPARTMENT**

**PROJECT IMPLEMENTATION UNIT (PIU) “NATIONAL WATER
RESOURCES MANAGEMENT-1” PROJECT**

**“TRAINING, ADVISORY AND INNOVATION CENTER”
PUBLIC FUND**

Final report

**“ESTABLISHMENT AND EXPLOITATION OF DEMONSTRATION PLOTS
AND PROVISION OF TRAININGS”**



Bishkek 2016

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INTRODUCTION

Within “National Water Resources Improvement” project, there are planned activities to improve intrafarm water resources management at a grassroots level to support initiatives undertaken under the project at the inter-farm level and river basins level. For these purposes, there is considered establishment of demonstration plots with improved irrigation techniques for the most successfully functioning Water Users Associations (WUAs).

Experience shows that the majority of farmers, who have come into agriculture from other areas of activity, do not have sufficient knowledge to irrigate agricultural crops. They often do not observe recommended rates and timing of irrigation, select parameters of irrigation technique improperly, do not keep water metering on field, do not use water-saving irrigation techniques, new irrigation technologies - all this taken together leads to land degradation and lowering crop yields.

To solve the above problems of farmers there is necessary information about water-saving technologies, methods and effective use of technologies reducing irrigation water losses.

PROJECT MAIN GOALS ARE:

- Establishment of demonstration plots for dissemination of more effective methods of water resources management at irrigated field level;
- Demonstration of water-saving irrigation methods, depending on regional natural climatic conditions and kind of crop and as well as soil type and surface slope;
- Training on use of effective methods of sustainable water resources management at irrigated field level and advanced water-saving irrigation methods;
- Development of the manual on water resources improved management at irrigated field level taking into account applicable measures;
- Dissemination of sustainable water resources management effective methods at irrigated field level and advanced techniques of surface and drip irrigation by copying from other farmers;
- Increase of economic efficiency of irrigated agriculture and crop production.

1. ESTABLISHMENT OF DEMONSTRATION PLOTS FOR WATER-SAVING IRRIGATION TECHNOLOGY

According to TR, there were established total 25 DP (demonstration plot) in the republic, there were adopted on 18 DP various water-saving technologies of surface irrigation (at least 1 ha each DP), 2 DP drip irrigation for horticultural crops (at least 1 ha each), 5 DP drip irrigation for vegetable crops (0.2 ha each).

Table 1 provides information about demonstration plots (where? and how many?). Surface irrigation water-saving technologies were chosen depending on natural climatic conditions of a region and kind of crops.

Table 2 provides information about various water-saving irrigation technologies applied in all regions of the country. The use of any technology depends on specific conditions of PD - soil, relief and kind of crop.

Using water-saving irrigation technologies in their field, farmers use effectively and economically the irrigation water, on field water is distributed evenly, irrigation rate is observed, soil fertility is maintained and productivity increases. Description of some water-saving irrigation technologies is given below.

Currently farmers use the following **water-saving irrigation** methods:

- Short furrow irrigation;
- Furrow irrigation;
- Watering with variable jet;
- Furrow watering of rice;
- Contour irrigation;
- Drip irrigation;
- Irrigation water metering method.

Short furrow irrigation

Many farmers use long furrows (from 200 to 700 m) to save their time. In long furrow irrigation in the beginning of furrow overwatering takes place, and at the end of furrow under watering. Therefore, short furrows irrigation is proposed to farmers.

To perform this technology on a plot to be watered there are cut short optimum furrows. Furrows length depends on drainage properties of soil and slope of the area.

The following table provides the data using which you can select the length of furrow and water flow in each furrow.

For example, field soil is sandy, slope is 0.02, and water permeability of soil is 18 cm/hour. Using the table there is determined the furrow length and water flow in each furrow. Water flow in each furrow will be - 0.2 l/sec., and furrow length – 65-70 m.

When applying "short furrow" method:

- watering is performed quickly and efficiently;
- uniform soil moisture and uniform plant growth are achieved along irrigation furrows;
- watering time and irrigation water are considerably economized.

This irrigation technology requires little physical efforts and time, at the same time the watering of soil along the length of furrows will be uniform.

This technology can be applied to all types of soils and crops. On sandy or rocky soils, this technology gives a good effect.

**Optimal length of furrows and irrigation spray,
depending on field slope and water permeability of soil**

Soils	Slope	Water permeability of soil for first hour of watering, cm/hour	Water flow in furrow, l/sec	Furrow length, m
Sandy and rocky	0,05 – 0,03	15-20	0,10 – 0,18	50 – 60
	0,03 – 0,02		0,18 – 0,25	60 – 70
	0,02 – 0,01		0,25 – 0,40	70 – 80
	0,01 – 0,006		0,40 – 0,55	80 – 100
	0,006 – 0,004		0,55 – 0,70	110 – 120
	0,004 – 0,002		0,70 – 1,4	100 – 120
Medium-textured loam	0,05 – 0,03	15-10	0,05 – 0,10	110 – 120
	0,03 – 0,02		0,10 – 0,15	120 – 130
	0,02 – 0,01		0,15 – 0,27	150 – 160
	0,01 – 0,006		0,27 – 0,40	160 – 180
	0,006 – 0,004		0,40 – 0,55	160 – 180
	0,004 – 0,002		0,55 – 1,20	120 – 130
Clay loam	0,05 – 0,03	10-5	0,02 – 0,03	100 – 110
	0,03 – 0,02		0,03 – 0,05	110 – 120
	0,02 – 0,01		0,05 – 0,18	120 – 170
	0,01 – 0,006		0,18 – 0,30	170 – 200
	0,006 – 0,004		0,30 – 0,40	200 – 210
	0,004 – 0,002		0,40 – 1,1	150 – 160

Second furrow irrigation

Currently one promising direction is the furrow irrigation technology. Before watering conventional irrigation furrows are cut on a field. During irrigation, water is supplied to every second furrow and first furrows remain dry. Water supply by furrows can be alternated, i.e. in the first irrigation, water is supplied to furrows 1-3-5-7, and in the second irrigation to furrows 2-4-6-8. This method is very easy to use.

At using this method:

- irrigation water is saved from 20 to 30%;
- weeds development is hampered;
- almost all crops can be watered, except cereals and perennial grasses.

At using this method, there will be required more water flow in comparison with each furrow irrigation.

When moistened pass between rows is too wide, there will be a dry area between furrows and the crop may be provided with insufficient water.

This method should not be applied to highly permeable soils (sandy, flinty, rocky and others).

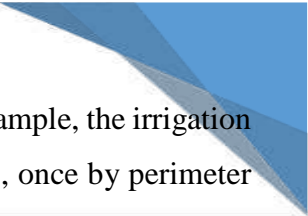
This method should not be used on steep slopes areas.

Alternate stream irrigation

Alternate stream irrigation means at the beginning of irrigation, there is supplied the highest (permitted) water flow in a furrow (e.g., $q = 0,30 \text{ l/s}$), and then, after a stream of water achieved $\frac{3}{4}$ portion of furrow or to the end of irrigation furrow, irrigation stream volume is reduced to the amount of resulting process drains, which in average is equal to discharge = 30 ... 35% of head water intake.



Irrigation of cotton and winter wheat by every second furrow method



It means that the head water intake should be reduced to 0.09 l/s, in this example, the irrigation stream will be $q = 0.30 - 0.09 = 0.21$ l/s. In this mode of water supply to furrow, once by perimeter mainly loose topsoil is moistened due to the rapid run of increased irrigation stream without managing to develop a process of erosion (soil erosion), which will come immediately after the complete saturation of 0-20 cm of soil layer.

Advantages of alternate stream irrigation:

- water flow is reduced at the end of field and saves water;
- reduction of water losses for drain;
- decrease of nutrients leaching;
- increase in productivity by maintaining optimal levels of air regime;
- uniform distribution of water along furrow;
- used for all types of soils and crops.

Furrow irrigation of rice

Rice refers to the types of crops that consume a lot of irrigation water. Rice is irrigated by irrigation checks. Irrigation checks are filled with water, and during the season, water level in irrigation checks does not fall. Seasonal water consumption of rice per 1 ha reaches 25000-40000m³. At that consumption rate of rice, there is shortage of irrigation water for other crops, which leads to various conflicts between farmers.

Many farmers, who are engaged in cultivation of rice in some areas of the country, use the method “furrow irrigation rice”. Ordinary wheat sowing technology is used for sowing rice. Sowing is done manually or with the help of a drill. Rice sowing rate – 120-150 kg/ha. Inter row width can be within 50-70cm, it depends on soil permeability. Watering is carried out by furrows. Number of irrigations – 15-20 times during the growing season, depending on climatic conditions.

Benefits of applying the method “Furrow watering of rice”:

- Saving of irrigation water 2-3 times;
- Do not destroy the soil structure;
- There is no land waterlogging;
- There is no need for special planning furrows;
- Possibility to harvest yields with conventional combine.

Requirement to using this method:

- Continuous monitoring of soil moisture before watering;
- Special variety is required;
- One should determine watering terms in time;
- Inter-irrigation period should not exceed 4-6 days.

Table1 – Information of demoplots in the republic

№	Name of demoplots	Number on oblasts							Total
		Batken	Jalal-Abad	Issyk-Kul	Naryn	Osh	Talas	Chui	
1	Water-saving technologies	2	3	3	3	5	4	5	25
2	Of them, drip irrigation for gardens (not less 1 ha)	1		1					2
3	Dripirrigation for vegetables (by 0,2 ha)		1		1	1	1	1	5

Table 2- Recommended kinds of various water-saving surface irrigation technologies by oblasts

№	Water-saving irrigation technology	Oblast						
		Batken	Jalal-Abad	Issyk-Kul	Naryn	Osh	Talas	Chui
1	Short furrow irrigation	+++	+++	+++	+++	+++	+++	+++
2	Furrow irrigation	+	+++	-	-	+++	++	++
3	Impulse irrigation	+++	+++	+++	+++	+++	++	++
4	Use of water-metering devices	+++	+++	+++	+++	+++	+++	+++
5	Contour irrigation (used on slopes)	+++	+++	+++	+++	++	+++	+++
6	Normalized water supply with tubes, siphons	+++	+++	+++	+++	+++	+++	+++
7	Sherbet suu	+++	+++	+++	+++	+++	+++	+++
8	Drip irrigation for gardens	+++	++	+++	++	++	++	++
9	Drip irrigation for vegetables	++	+++	++	++	+++	+++	+++

Note: +++ - can be used everywhere, ++ - used partially, + - used in some places, - - not used.

2. INSTALLATION OF NECESSARY EQUIPMENT ON DEMONSTRATION PLOT

There were established total 25 DP in the republic, on 7 demoplots of which – installation of drip irrigation systems, and on the remaining 18 plots–adoption of various water saving irrigation technology.

On July 6, 2016 according to the contract between PIU and ASC “Kaplia Plus” there started procurement of equipment and materials for drip irrigation systems for DP. At the request of demo farmers, primarily DISs were installed on DP according to the schedule (**table 3**).

Drip irrigation is method of soil moisturizing in root zone of plants by means of a layer of continuous portioned (drip) water supply by a special dripper. The system (DIS) consists of a

reservoir (tank), filter, faucet, and main distribution pipe, irrigation pipe, and dripper. Irrigation water using special drippers or microtubes is supplied lossless to each plant.

Drip irrigation system can be used in the following conditions:

- in areas with irrigation water deficit;
- on slope, uneven and foothill lands;
- on highly permeable soils (rocky, sandy, gravelly, etc.);
- inlands where other irrigation methods are not applicable and ineffective.

Drip irrigation system can be applied to apricot, apple, peach, cherry, vineyard, tomato, pepper, cucumber, strawberries, watermelon, melon and other high-yielding crops, as well as in greenhouses for vegetables.

Drip irrigation has the following advantages:

- compared with furrow irrigation saving of water increases in 4-10 times;
- crop yields compared with furrow irrigation increase in 1.5-2 times;
- crops maturation acceleration;
- prevents topsoil washing, salinization and waterlogging of soil;
- with a small flow of water one can irrigate large areas;
- does not require land planning and heavy expenses;
- possibility of fertilization with irrigation water.








Certificates for details of drip irrigation systems are in **Annex 1**.

The following materials were purchased, delivered and installed for 25 DP according to specifications (**table 4, 5, 6**).

Table3 - Schedule of installation of drip irrigation systems for 2016

№	Oblast	Rayon	Village council	Crop	Area, ha	Installation date
1	Batken	Batken	Kara-Bulak	Apricot	1	28-30.07
2	Jalal-Abad	Nookan	Shaidan	Vegetables	0,3	16-17.07
3	Issyk-Kul	Jety-Oguz	Kyzyl-Suu	Apple	1	22-24.07.
4	Naryn	Naryn	Jan-Bulak	Vegetables	0,2	12-13.07.
5	Osh	Kara-Suu	Toloikon	Vegetables	0,2	9-10.07
6	Talas	Talas	Berdike Batyr	Vegetables	0,2	15-17.07.
7	Chui	Moskva	Chapaiev	Vegetables	0,2	6.07.2016

Table 4 - Specifics of materials for drip irrigation system for garden, plot area 1 ha, plot size - width – 100m, length – 100m, planting scheme – 4*4m.

№	Detail name	Unit of measure	Q-ty for 1 plot	Q-ty for 2 plots	Esquisse	Specifics
1	Water tank	pcs.	1	2		Material - plastic or iron volume - 5000 liter, with a hole for mounting of pipe sleeve with diameter 63 mm.
2	Pump supplying water to tank	pcs.	1	2		Electric or petrol pump for supplying water to tank, pressure -10 m, flow rate – 2-3 cubic meters per hour, 220 volt
3	Iron connector for connection to the tank to connect to filter, diameter 63 mm	pcs.	1	2		Iron, length 10-15 cm, external thread on both sides, with two packing nuts, diameter 63 mm
4	Ball valve diameter 63 mm	pcs.	2	4		Material PVC or iron, internal thread, with unilateral or bilateral handle, hinge, diameter 63 mm
5	Fine water filter, mesh, diameter 63 mm, water capacity not less than 5m3/hour	pcs.	1	2		Filter mesh or cassette, plastic casing, removable grid, external thread diameter of inlet and outlet - 63 mm, water capacity - not less than 5m3 / hour
6	“Female” elbow to connect to filter, diameter 63 mm	pcs.	1	2		Material – PVC, pressure to 5 Atm., compact design, rapid removal from pipe line and quick replacement of sealing ring without additional
7	T-socket, size 63*63*63 mm	pcs.	1	2		









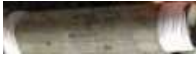








8	Elbow(corner), size 63*63 mm	pcs.	2	4		tools, heat and cold-resistant, diameter 63 mm
9	Plug, diameter 63 mm	pcs.	2	4		
10	Polyethylene pipe 63 mm	m	100	200		Material - polyethylene, external diameter - 63 mm, wall thickness - 2-3 mm, water pressure to 5 Atm.
11	Polyethylene pipe 20 mm	m	2500	5000		Material - polyethylene, external diameter - 20 mm, wall thickness - 2-3 mm, water pressure to 5 Atm.
12	Water regulating faucets in irrigation pipe	pcs.	30	60		Material - PVC, with bilateral handle, diameter 20 mm, one side with thread with size 3/4
13	Dripper	pcs.	1500	3000		Adjustable dripper at a rate 2-100 l/h
14	Plug 20 mm	pcs.	30	60		Material – PVC, diameter 20 mm, pressure to 5 ATM
15	Clamp 63 to 20 mm	pcs.	30	60		Material - plastic, diameter 63 to 20 mm

Table 5 - Specifics of materials for drip irrigation system for vegetables, plot area 0.02 ha, plot size - width – 40m, length – 50m, planting scheme – 0.70*0.3m.

№	Detail name	Unit of measure	Q-ty for 1 plot	Q-ty for 5 plots	Esquisse	Specifics
1	Water tank	pcs.	1	5	 	Material - plastic or iron volume - 3000 liter, with a hole for mounting of pipe sleeve with diameter 63 mm with cap.

2	Pump supplying water to tank	pcs.	1	5		Electric or petrol pump for supplying water to tank, pressure -10 m, flow rate – 2-3 cubic meters per hour, 220 volt
3	Iron connector for connection to the tank to connect to filter, diameter 63 mm	pcs.	1	5		Iron, length 10-15 cm, external thread on both sides, with two packing nuts, diameter 63 mm
4	Ball valve diameter 63 mm	pcs.	1	5		Material PVC or iron, internal thread, with unilateral or bilateral handle, hinge, diameter 63 mm
5	Fine water filter, mesh, diameter 63 mm, water capacity not less than 5m3/hour	pcs.	1	5		Filter mesh or cassette, plastic casing, removable grid, external thread diameter of inlet and outlet - 63 mm, water capacity - not less than 5m3 / hour
6	“Female” elbow to connect to filter, diameter 63 mm	pcs.	1	5		Material – PVC, pressure to 5 Atm., compact design, rapid removal from pipe line and quick replacement of sealing ring without additional tools, heat and cold-resistant, diameter 63 mm
7	T-socket, size 63*63*63 mm	pcs.	1	5		
8	Elbow(corner), size 63*63 mm	pcs.	2	10		
9	Plug, diameter 63 mm	pcs.	2	10		
10	Polyethylene pipe 63 mm	m	40	200		Material - polyethylene, external diameter - 63 mm, wall thickness - 2-3 mm, water pressure to 5 Atm.
11	Flexible plastic irrigation tape	m	3000	15000		Material-polyethylene, pressure - 0.3-1 Atm, outer diameter 16 mm, wall thickness –not less 6 mm, distance between drippers - 20cm / 30cm / 40cm, dripper flow rate - 2.0-4.0 l/h.




12	Water regulating faucets in irrigation pipe	pcs.	60	300		Material - PVC, with bilateral handle, with elastic sealing and locking screw to secure irrigation pipe, diameter 16 mm
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Table 6 - Specifics of materials for demoplots

№	Detail name	Unit of measure	Q-ty for 1 plot	Q-ty for 5 plots	Esquisse	Specifics
1	Cippoletti weir	pcs.	2	50		Material-iron, wall thickness not less 3 mm, weir type – BЧ-50, shape - trapezoidal, threshold width - 50 cm, notch height - 25 cm, water capacity up to 80 l/sec
2	Thomson weir	pcs.	4	100		Material-iron, wall thickness not less 3 mm, weir type – BT-20, shape -triangular, notch height 20 cm, water capacity 20 liters/sec
3	Tube for uniform water supply to furrow	m	50	900		Polyethylene pipe, diameter 20 mm, wall thickness: 2 mm
4	Film for controlling water to furrow	m	10	180		Polyethylene film, transparent, width – 1-1.5 m



DIS on demoplot, Moskva rayon



Naryn rayon



Talas rayon

3. CONDUCTION OF TRAINING FOR FARMERS

There were conducted trainings for members and staff of WUA on water saving technologies and methods, as well as improved agronomy in the sphere of irrigation on 25 pilot demonstration plots.

Advisors have prepared training program (**Annex 2**) to conduct trainings, and handouts (booklets) were distributed to each group of participants, banners on water saving technologies and drip irrigation were handed out for each demoplot.

25 trainings were conducted with participation of 534 farmers (451 of them - men, 83 - women). The list of participants and photos from the training were provided in previous reports.

Information about the conducted trainings is in **Table 7**.

Opinion of training participants:

- received a lot of information about water-saving irrigation technologies;
- they can use drip irrigation in their fields;
- know how to use a soil moisture meter and determine the time of irrigation;
- learn about different agronomic activities, methods of controlling pests and diseases;
- can determine water flow through the various weirs.

Recommendations of participants:

- conduct trainings before the start vegetative irrigation;
- increase the number of demoplots;
- conduct 2-3 day training;
- spend more time to agro-technical issues.

4. ORGANIZATION OF TRAINING TOUR FOR OFFICIALS OF NEIGHBORING WUAs

Local advisors and WUA organized training tour for staff of neighboring WUAs and WUA SD. They told about their experiences on the project, about water-saving irrigation methods, agronomic activities and results of new water-saving irrigation technique.

514 farmers including 69 women participated at 25 seminars. List of participants of the training tour and photos are in previous reports. Thereby, local advisors shared their knowledge with neighboring farmers, members of WUA and WUA SD.

Information of trainings is in **Table 8**.

As a result of analysis of trainings to pilot members and neighboring WUAs we have found the following:

1. Strong points:

- Trainings are conducted in Kyrgyz and Russian languages;
- Specialists have theoretical and practical skills to conduct trainings
- Trainings are theoretical and practical;
- Trainings cover the basic techniques of water-saving technologies and the entire process of cultivation technology of crops;
- Farmers have great interest in trainings.

2. Weak points:

- Training conducted after sowing crops with delay from the process;
- WUA leaders do not always provide 100% attendance of their members of WUA for the planned trainings.

3. Opportunities:

- Provide training in a timely manner in accordance with plans - training schedules, observing the entire process of cultivation technology of crops;
- Conduct additional trainings at the request of farmers;
- During training to provide services on other topics of interest.

4. Risk:

- Failure to use of the acquired knowledge on water-saving irrigation technology on their plots by some members of WUA leads to the loss of irrigation water and soil erosion.

5. ORGANIZATION AND CONDUCTION OF FIELD DAYS

In September on each demoplot, there were conducted field days to show innovative irrigation technology used on a demoplot. The field day program is in **Annex 3**. Field days on demonstration plots on the topics: “Ways and methods of irrigation water metering in channels, water metering by weirs (Thomson Chipoletti, Satarkulov, etc.), irrigation regime (rates, timing and duration of irrigation) of crops” were carried out on all 25 demofields. There were invited neighboring farmers, WUA members, representatives of local authorities and mass media. 701 people participated, including 109 women. Photos and list of participants of the field day are in the report of 3rd tranche. Participants saw firsthand the results of water saving irrigation technologies and disseminate further this information among other farmers.

Information about the conducted field days are provided in **Table 9**.

Table 7 – Information of trainings conducted in pilot WUAs

№	Oblast	Rayon	WUA	Village council	Date of conduction	Full name of trainer	Total q-ty of participants	Q-ty of women
1	Batken	Batken	Kosh-Kol	Kara-Bulak	18.08	Nazarov	21	
2		Kadamjay	Kara-Dobo	Masaliev	20.08	Ryskulov	23	2
3	Jalal-Abad	Suzak	Tushum-Suu	Taigaraev	26.08	Ozgonov	23	
4		Bazar-Korgon	Kenesh-Suu	Kenesh	24.08	Ozgonov	20	8
5		Nooken	Shaidan-Kara-Ungur	Shaidan	22.08	Ozgonov	23	7
6	Issyk-Kul	Ak-Suu	Orlinoe Jaiylma Shapak	Otradnoe	17.08	Minbaev	23	5
7		Zety-Oguz	Shatyly	Kyzyl-Suu Saruu	11.08	Minbaev	25	1
8		Issyk-Kul	Suuchu	Sadyrake	10.08	Tezekbaeva	20	4
9	Naryn	Kochkor	Orton	Kum-Dobo	24.08	Zhunosov	20	3
10		Naryn	Kyzyl-Zoo-Dostuk	Jan-Bulak	17.08	Zhunosov	20	4
11		At-Bashy	Orto-Keltebek	Kara-Koiun	27.08	Zhunosov	20	-
12	Osh	Karasuu	Jany-Aryk	Toloikon	16.08.	Zholdoshev	23	9
13		Karasuu	Maz-Aikal	Otuz-Adyr	18.08	Zholdoshev	20	
14		Aravan	Sokhi-Darie	Chek-Abad	20.08	Madrakhimov	22	
15		Uzgen	Altyn-Kol-Bakmal	Don-Bulak	23.08	Toktorbaev	20	
16		Nookat	Abshyr-Tany	Kara-Jon	25.08	Madrakhimov	21	12
17	Talas	Talas	Bolkuldok-Suu	Kozuchak v.	08.08	Asanbaeva	22	0
18		Bakay-Ata	Kurama-Tor	Boo-Terek	17.08	Andakulov	24	2

			Kyzyl Bakyr					
19		Kara-Buura	Mol-Bulak	Chymgent	10.08	Asanbaeva	20	4
20		Manas	Dyikan	Maiskiy	12.08	Asanbaeva	21	1
21	Chui	Kemin	Eldik Ak-Tilek	Chym-Korgon	04.08	Beishenaliev	20	0
22		Sokuluk	Novaia-Zemlia Sovkhoznyi	At-Bashy v/c Frunze v.	08.08	Umetbaev	21	1
23		Jaiyl	March 2001	Kyzyl-Dyikan v.	06.08	Mambetov	22	2
24		Moskva	Narboto Suu	Chapaevv/c	02.08	Umetbaev	21	2
25		Ysyk-Ata	Jaiylma Lux	Luxemburg	10.08	Zhaiylmyshev	21	16



Photo: Trainings conducted in pilot WUAs Southern Region

Table 8 - Information of trainings conducted in neighboring WUAs

№	Oblast	Rayon	WUA	Village council	Date of conduction	Full name of trainer	Total q-ty of participants	Q-ty of women
1	Batken	Batken	Bazar-Bashy-Batken	Batken	19.08	Nazarov	20	
2		Kadamjay	Kozho-Kaiyr	Markaz	21.08	Ryskulov	23	
3	Jalal-Abad	Suzak	Tash-Bulak-Suu	Tash-Bulak	27.08	Ozgonov	18	
4		Bazar-Korgon	Murat-Murap	Maasy	23.08	Ozgonov	21	
5		Nooken	Aral-Sai	Aral-Sai	25.08	Ozgonov	21	
6	Issyk-Kul	Ak-Suu	Jaiylma-Shapak	Otradnoe v.	28.08	Minbaev	20	5
7		Zety-Oguz	Saruu-Juuku	Saruu v.	13.08	Minbaev	23	6
8		Issyk-Kul	-	Chon-Oruktu v.	17.08	Tezekbaeva	20	7
9	Naryn	Kochkor	Orton	Ak-Jar c.	25.08	Zhunusov	24	10
10		Naryn	K-Zoo-Dostuk	Dostuk v.	18.08	Zhunusov	20	6
11		At-Bashy	Orto-Keltebek	Kara-Koiun v.		Zhunusov	20	8
12	Osh	Karasuu	Ene-Sai	Otuz-Adyr	19.08	Zholdoshov	20	
13		Karasuu	Muian	Shark	17.08.	Zholdoshov	20	
14		Aravan	Sokhil	Anarov	22.08	Madrakhimov	20	
15		Uzgen	Tushtuk-Altyn-Bulak	Myrza-Ake	24.08	Toktorbaev	20	
16		Nookat	Moltur-Suu	Onekibel	26.08	Madrakhimov	18	
17	Talas	Talas	Kok-Oi	Kok-Oi v.	18.08	Asanbaeva	20	5
18		Bakay-Ata	Kyzyl Bakyr-Suu	Boo-Terek v.	18.08	Andakulov	21	2

19		Kara-Buura	Kok-Salma	Cholponbai v.	11.08	Asanbaeva	20	0
20		Manas	Bereke	Uch-Korgon v.	20.08	Asanbaeva	20	3
21	Chui	Kemin	Ak-Tilek	Kyzyl-Oktiabr v.	05.08	Beishenaliev	21	1
22		Sokuluk	Sovkhoznyi	Frunze v.	09.08	Umetbaev	20	0
23		Jaiyl	-	Poltavka	10.08	Mambetov	21	3
24		Moskva	Kyz-Molo	Tselinny v.	05.08	Umetbaev	23	4
25		Ysyk-Ata	Oi-Talgy	Internatsional v.	17.08	Zhaiylmyshev	20	9



Photo: Trainings conducted in neighboring WUAs Northern region

Table 9 – Information of farmers field days on 25 established demonstration plots

№	Oblast	Rayon	WUA	Area (ra)	Crops	Irrigation / Water saving Technologies	Farmers field days		
							Dates	Total q-ty of farmers	q-ty of women farmers
1	Batken	Batken	Kosh-Kol	1.0	Gardens	Drip irrigation	8.09	32	2
2		Kadamjay	Kara-Dobo	0.75	Onion	Short furrows	15.09	30	
3	Jalal-Abad	Suzak	Tushum-Suu	1.3	Corn	Short furrows	20.09	30	8
4		Bazar-Korgon	Kenesh-Suu	0.8	Cotton	Short furrows	16.09	30	8
5		Nooken	Shaidan-Kara-Ungur	0.3	Cucumber (0.1) Tomato (0.2)	Drip irrigation	14.09	33	4
6	Issyk-Kul	Ak-Suu	Orlinoe	1	Barley	Short furrows	15.09	30	6
7		Jety-Oguz	Shatyly	1	Orchard	Drip irrigation	14.09	30	8
8		Issyk-Kul	Suuchu	1	Potato	Short furrows	15.09	28	13
9	Naryn	Kochkor	Orton	1	Potato	2nd furrow irrigation	13.09	18	12
10		Naryn	Kyzyl-Zoo-Dostuk	0.20	Vegetables	Drip irrigation	16.09	23	7
11		At-Bashy	Orto-Keltebek	1	Barley	2nd furrow irrigation	09.09	26	4
12	Osh	Kara-Suu	Jany-Aryk	1.0	Gourd field	Drip irrigation	14.09	31	
13		Kara-Suu	Maz-Aikal	0.90	Corn, vegetables	Short furrows	17.09	30	7
14		Aravan	Sokhi-Darie	0.3	Rice	Furrow irrigation	8.09	32	

15		Uzgen	Altyn-Kol-Bakmal	1.04	Corn, grasses, vegetables	Short furrows	15.09	30	5
16		Nookat	Abshyr-Tany	1.0	Corn	Short furrows	15.09	30	7
17	Talas	Talas	Bolkuldok-Suu	0.2	Vegetables	Drip irrigation	08.09	30	3
18		Bakay-Ata	Kurama-Tor	1.0	Bean	2nd furrow irrigation	05.09	31	1
19		Kara-Buura	Mol-Bulak	1.0	Bean	Short furrows	14.09	30	4
20		Manas	Dyikan	1.0	Corn	2nd furrow irrigation	15.09	30	0
21		Kemin	Eldik	1.0	Corn	2nd furrow irrigation	27.09	30	1
22	Chui	Sokuluk	Novaia-Zemlia	2.0	Sugar beetle	2nd furrow irrigation	16.09	25	2
23		Jaiyl	March- 2001	1.3	Sugar beetle	Short furrows	08.09	30	5
24		Moskva	Narboto-Suu	0.20	Vegetables	Drip irrigation	14.09	27	3
25		Ysyk-Ata	JaiylmaLux	1.0	Corn	2nd furrow irrigation	15.09	25	1



Photo: Field days

6. HANDOUTS, BOOKLETS AND BANNERS

During training for farmers there were prepared handouts –booklets on drip irrigation, water metering methods and water-saving irrigation techniques in Russian and Kyrgyz languages, handouts on agronomy in Kyrgyz and Russian languages.

To disseminate information on water-saving technology among farmers during field days and training booklets on 3 topics were prepared and published (**Annex 4**).

25 banners were published for use in demonstration plots.

Table 10 – Information of published booklets

№	Topic	Language	Copies, pcs.
1	Water-saving irrigation methods of crops	Russian	150 pcs.
2	Water-saving irrigation methods of crops	Kyrgyz	150 pcs.
3	Drip irrigation – saving water and increase of yields	Russian	200 pcs.
4	Drip irrigation – saving water and increase of yields	Kyrgyz	200 pcs.
5	Irrigation water metering methods on fields	Russian	150 pcs.
6	Irrigation water metering methods on fields	Kyrgyz	150 pcs.
TOTAL			1000 pcs.

Table 11 – Information of banners

№	Topic	Language	Copies
1	Drip irrigation – modern water-saving irrigation technology	Russian	2
2	Drip irrigation – modern water-saving irrigation technology	Kyrgyz	5
3	Water-saving and irrigation water metering methods	Russian	6
4	Water-saving and irrigation water metering methods	Kyrgyz	12
TOTAL			25 pcs.

7. REGIONAL REPUBLICAN SEMINAR

There were organized regional seminars in seven oblasts with participation of 267 people, including 37 women at the end of growing season. Program of regional seminars is in **Annex 5**.

The main objective of seminars is presentation of materials on results of training and demonstration work on plots.

The seminars were attended by representatives of regional and rayon agricultural organizations, WRBA, representatives of local government, representatives of oblast, rayon SD, and representatives of WUAs in villages, farmers.

The seminar was organized and conducted on earlier prepared program. There were invited representatives from the regional agrarian sector of the Regional Representative of the Kyrgyz Republic.

Representatives of oblast Agrarian Sector of the Kyrgyz Republic Regional Representative Office were invited to the seminar.

TAIC trainers prepared a presentation on the activities under NWM project and results on demonstration plots, also there was given detailed information about used water-saving methods on demonstration plots under the project and their advantages, which benefit in preservation of soil cover and water saving.

Local consultants presented the irrigation water metering methods via water measuring devices of Satarkulov, Chipoletti, Thomson, and showed the working principles of soil moisture tester.

Videos on drip irrigation were provided at the seminar and handouts were distributed to participants.

In general, participants received a lot of information and positive emotions from the seminar, the participants wished success to NWM project and made recommendations.

Recommendations of participants:

1. Conduct training in winter, when WUA members are free from agricultural operations, and separately on water-saving irrigation techniques and advanced technologies of crop cultivation;
 2. Conduct field days during growing season with practical demonstrations of irrigation water metering and agro-technical measures, i.e. applying fertilizers and plant protection products;
 3. Increase the number of field days in each rayon to involve more farmers and gardeners;
 4. Create hydro-modular maps of locations to know where and in what state water resources are.
- Make a water management plan;

5. Conduct an inventory of instruments in WUA, where and in what state the instruments are, which were used in the process of water supply and other purposes;

6. Draw farmers' attention not to only problems of irrigation and seed production, which are important aspects in obtaining good yields;

7. Organize demonstration plots at first in one rayon in all WUAs, and next year in other rayons, but other participants – such a proposal is not approved, having stated that it is better to conduct several demonstrations, but in each rayon;

8. Reduce areas under demoplotsfor DIS in gardens to 0.02-0.05 ha and locate them in zones of Naryn oblast (Kochkor and At-Bashy rayons);

9. Increase the number of field days in each rayon to involve more farmers and gardeners;

10. Establish demonstration plots in all rayons of the oblast;

11. Invite representatives of all WUAs of the rayon and representatives rayon ADA to trainings and field days.



Seminar in Batken

Issyk-Kul oblast





Talas oblast



Osh oblast

On November 10, 2016 in Bishkek, there was conducted national seminar under NWM project “**Establishment and operation of demonstration plots and provision of training**”. Experts of OSD, RSD, RWM, local government, Institute of Irrigation, representatives of oblast and rayon SD, representatives of WUA in villages and farmers participated in the seminar.

The seminar was organized and conducted on the prepared program. Seminar program is in **Annex 6**. In total, 46 people, including 13 women participated in the seminar.

TAIC PF Director Karasartov Sh. opened the seminar.

Presentation was conducted in the following format:


- NWM project component coordinator K. Zhaanbaev and TAIC PF director Sh. Karasartov presented the general information on aims, tasks and results of NWM project;
- TAIC PF expert K. Abdraimov provided the presentation on Southern oblasts;
- TAIC PF trainer G. Asanbaeva provided the presentation on outcomes and training results in Talas oblast;
- Demonstration farmer Karymzhy Kulov from Jety-Oguz rayon also provided his presentation;
- TAIC PF trainer T. Umetbaev presented how trainings took place in Moskva and Sokuluk rayon;
- TAIC PF specialist Zh. Eshperov provided the presentation in the northern region.

In his presentation, he outlined the main goals, objectives and results achieved by the northern region of the republic under NWM project phase-1 for 2016.

Videos on water-saving technologies and drip irrigation were provided at the seminar. Handouts were distributed to the seminar participants.

Recommendations of the seminar participants:

- ✚ Conduct two trainings in winter:

- 
1. Water-saving technologies and irrigation water metering methods;
 2. Advanced technologies of crops cultivation.

✚ To conduct two field days based on vegetative irrigation of:

1. Practical demonstration of water-saving technology and irrigation water metering method;
2. Practical demonstration of organic fertilizers application and crop protection products at watering.

✚ Conduct experiments on all demonstration plots. For example, application of the preparation Kyrgyz-Humate, rotted manure, organic-mineral fertilizers, etc.

✚ Conduct comparative analysis of demonstration plots with control plots. (Yields, profits and savings of irrigation water, etc.).

✚ If the project will be next year, it should cover all rayons of the republic.

✚ For effective implementation of the project, there is necessary close co-operation with representatives of local WUA and LG of rayon RSD, oblast OSD and rayon, oblast ADA of each region.

Recommendations:

During the season of 2016, TAIC PF conducted training and field days activities to NWM project beneficiaries. We should note the considerable interest of WUA members to trainings, in particular members of pilot WUAs. Farmers attended with great pleasure all scheduled training sessions that often reflected in the interim reports.

We consider that it is necessary to take into account the following recommendations to prevent errors and omissions in further trainings:

- Training should start from the early February, all the more in the Southern region, spring-field works begin much earlier than in the North. In addition, at sowing winter crops in autumn, they provide certain consultations.

- Organizations, responsible for mobilizing WUA members, at creation and mobilization should take into account places of residence of these associations' members.

- Organization in regions should mobilize most interested in trainings farmers, who will be aware of importance of the activities and how much money will be spent even for one farmer.

- If possible, it is necessary to divide the number of trainings on water-saving irrigation and agricultural crop cultivation technologies. In addition, it is necessary to conduct field days twice. The first on water-saving irrigation technologies. The second on advanced technologies of agricultural crop cultivation. Moreover, it is also necessary to take into account the age of trainees, in our case, it

ranges from 25 to 60 years, and therefore the percentage of assimilation of knowledge is below with aging.

- Develop a tangible work plan separately on each demonstration topic, i.e. demo farmer shall have a clear idea of what works and when to perform to obtain certain results.
- Carry out systematic metering of irrigation water on demonstration plots, which is an important economic parameter.
- Revise the financing of some topics of demonstration to conduct demonstration successfully.
- Pay special attention to processing and marketing of farm products.
- Pay attention to preliminary preparation of ditches, canals before the start of irrigation.
- Apply organic-mineral fertilizers and plant protection products to increase the yields of agricultural crops on demonstration plots.
- Organize regular and planned working meetings of organizations involved in the project activities for effective work on training of beneficiaries under NWM project.



Table 12 –Number of participants of oblast seminars under NWM project

№	Oblast	Place of conduction	Date of conduction	Q-ty of participants, person	
				Total	Include. women
1.	Issyk-Kul	Karakul c.	14.10.2016	44	13
2.	Naryn	Naryn c.	12.10.2016	31	3
3.	Chui	Bishkek c.	21.10.2016	28	8
4.	Talas	Talas c.	18.10.2016	40	7
5.	Batken	Batken c.	19.10.2016	43	4
6.	Osh	Osh c.	20.10.2016	40	1
7.	Jalal-Abad	Jalal-Abad c.	21.10.2016	41	1
	TOTAL			267	37

8. ECONOMIC CALCULATION OF VARIOUS WATER-SAVING IRRIGATION TECHNOLOGY ON DEMONSTRATION PLOTS

Local advisors and demo farmers held accounting of all events on DP to calculate economic effectiveness of new technologies from the beginning of growing season: sowing date, harvesting, weeding, water metering, quantity of irrigations, agricultural machinery, costs of fertilizer, fuel, labor costs, yield, gross output, price, profit. These data were compared with data in conventional irrigation techniques, such as furrow irrigation.

Table 13 shows the calculations of water consumption and irrigation rates on demoplots.

As the table shows, using short furrows for spring wheat farmer N. Mambetaliev of Ak-Suu rayon saved 6,000 m³ of water.

Farmer K. Kulov from Shatyly, Jeti-Oguz rayon consumed 1800 m³ of water using drip irrigation instead of 4000 m³ at ordinary irrigation.

Farmer N. Zhuk - when watering potato by irrigation through alternated furrows the rate was 2000 m³, and at furrow irrigation it made 2800 m³ per 1 ha, water savings - 800 m³.

Detailed data on water consumption are in the **Table 13**.

The following **table 14** provides detailed economic calculations for all plots and comments to each.

The advantages of drip irrigation in the opinion of farmers who used the technology of drip irrigation on their plots are:

- Increased productivity;
- Water saving;
- Rapid growth and maturation of crops;
- Fertile layer of soil is not washed off;
- Less weeds between rows.
- Semi-automation of watering.
- Reduction of costs of irrigators.
- Reduction of the pump work.
- Possibility of water fertilization, that is saving mineral fertilizers.
- Increased crop yields.

Disadvantages of drip irrigation:

- High cost of the system;
- Inconvenience in conducting agricultural activities (manual cultivation, weeding);
- Filter clogged at using not clean water for irrigation (sediment).

Table 13 - Water consumption and irrigation rates of crops on demonstration plots for 2016

№	Oblast	Rayon	WUA	Full name of farmer	Area, ha	Crop	Water-saving technology	Water volume m ³		Irrigation rate m ³ /ha	
								Water-saving	Traditional	Water-saving	Traditional
1	Issyk-Kul	Ak-Suu	Orlinoe	N. Mambetaliev	1	Spring wheat	Short furrows	2000	2400	2400	3000
2		Jety-Oguz	Shatyly	K. Kulov	1	Garden	Drip irrigation	800	2000	1800	4000
3		Issyk-Kul	Suuchu	N. Zhuk	1	Potato	Alternated furrow	1800	2000	2000	2800
4	Naryn	Kochkor	Orton	Beishenkulov	1	Potato	Alternated furrow	2000	2400	2000	2800
5		Naryn	Kyzyl-Zoo	T. Mambetaliev	0.20	Vegetables	Drip irrigation	640	960	3200	6000
6		At-Bashy	Orto-Kel	Kadyrov	1	Spring barley	Short furrows	1000	1200	1800	2400
7	Chui	Kemin	Eldik	B. Medetov	1	Corn	Alternated furrow	3000	3600	3600	5000
8		Ysyk-Ata	Jaiylma-Lux	R. Jalpiev	1	Corn	Alternated furrow	2800	3200	3600	5000
9		Sokuluk	Novaia-Zemlia	S. Altykeev	2	Sugar beetle	Short furrows	3000	3500	3600	5000
10		Moskva	Narboto-Suu	O. Jeenaliev	0.20	Vegetables	Drip irrigation	520	800	2800	4800
11		Jaiyl	March-2001	I. Zyrkin	1	Sugar beetle	Short furrows	3200	3600	3600	5000
12	Talas	Bakay-Ata	Kurama-Tor	D. Akmatov	1	Bean	Alternated furrow	3240	4100	3600	5000

13		Talas	Bolkuldok-Suu	A. Kokoev	0.20	Vegetables	Drip irrigation	480	840	3200	6000
14		Kara-Buura	Mol-Bulak	K. Saljanov	1	Bean	Short furrows	2800	3200	3600	5000
15		Manas	Dyikan	K. Naizabekov	1	Corn	Alternated furrow	3300	3600	3600	5000
16	Batken	Batken	Kosh-Kol	O. Toksonov	1	Gardens	Drip irrigation	6500	80	6500	80
17		Kadamjay	Kara-Dobo	A. Aliev	0.75	Onion	Short furrows	5500	7650	11000	10200
18	Jalal-Abad	Suzak	Tushum-Suu	Sh. Murzakanov	1.3	Corn	Short furrows	7250	8476	7250	6520
19		Bazar-Korgon	Kenesh-Suu	A. Narmatov	0.8	Cotton	Short furrows	4160	6400	8320	8000
20		Nookan	Shaidan-Kara-Ungur	O. Jambilov	0.1	Cucumber	Drip irrigation	535	96	5350	960
					0.2	Tomato		642	272	6420	1360
21	Osh	Karasu	Jany-Aryk	M. Bakirov	0.35	Cucumber	Drip irrigation	560	300	5600	860
22		Karasu	Maz-Aikal	A. Omurzakov	0.9	Corn	Short furrows	2259	6147	7530	6830
23		Aravan	Sokhi-Darie	M. Ismanov	0.3	Rice	Rice alternated furrow	14490	5580	48300	18598
24		Uzgen	Altyn-Kol-Bakmal	B. Kamalov	1.04	Corn	Short furrows	1468	6550	7340	6300
25		Nookat	Abshyr-Tany	R. Djoroev	1	Corn	Short furrows	3774	4824	7548	4824

Table 14 – Economic calculations on demoplots**Economic analysis**

“Orlinoe” WUA. Otradnoe v., Ak-Suu rayon, Issyk-Kul oblast

Demo farmer: Mambetaliev Nurlan.

Control plot. Farmer: Z. Osmonov

Crop: Spring wheat

№	Name	Unit of measure	Water-saving method Short furrow irrigation			Traditional method Free-flow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	kg	200	25	5000	200	25	5000
3	Fertilizers	kg	100	18	1800	100	18	1050
4	Pesticides			-	1250			-
5	Equipment and fuel costs	liter	100	30	3000	100	30	3000
6	Hand labor	day	5	500	2500	5	500	2500
7	Payment for irrigation water	som	1	250	250	1	250	250
8	Transport costs	travel	2	600	1200	2	600	1200
9	Taxes and social charges	som			746			746
10	Total costs (amount 2..9)	som			15746			13746
11	Productivity	c/ha	1	40	40 centner	1	30	30 centner
12	Gross yield	kg	4000	10-00	40000	3000	10-00	30000
13	Profit	som			24254			16254
14	Difference in profit	som			+8000 som			
15	Irrigation water volume for whole period m³	m ³			2000			2400
16	Irrigation water saving	m ³			400			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **8000 SOM**, and saving of irrigation water made **400 m³** per ha.

Economic analysis

“Shatyly” WUA. Jety-Oguz rayon, Issyk-Kul oblast

Demo farmer: Kulov Karymzhy.

Control plot. Farmer: M. Cholponbaev

Crop: Young orchard

№	Name	Unit of measure	Water-saving method Drip irrigation			Traditional method Irrigation with a hose		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate							
3	Fertilizers	kg	100	24	2400	100	24	1500
4	Pesticides	liter	3	250	750	2	250	500
5	Equipment and fuel costs				2500			2500
6	Hand labor	day	7	400	2800	7	400	2800
7	Payment for irrigation water	ha	1x3	300	900	1x5	300	1500
8	Transport costs	travel	1	500	500	1	500	500
9	Taxes and social charges				336			336
10	Total costs (amount 2..9)				10186			8636
11	Productivity	c/ha	1	5	5	1	4	4
12	Gross yield	kg	500	20-00	10000	400	20-00	8000
13	Profit	som			-186			-636
14	Difference in profit	som			-			-
15	Irrigation water volume for whole period m³	m³			800			2000
16	Irrigation water saving	m³			1200			

It is seen from the table that profit from both the demonstration plot and control plot is not obtained, due to the fact that the orchard is young (3 years). And saving of irrigation water made **800 m³** per ha.

Economic analysis

WUA «Suuchu». Grogorievka v., Issyk-Kul rayon, Issyk-Kul oblast

Demo farmer: Zhuk Natalia Borisovna.

Control plot. Farmer: K. Ibraev

Crop: Potato

№	Name	Unit of measure	Water-saving method Short furrows irrigation			Traditional method Long furrows irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate							
3	Fertilizers	kg	200	25	5000	200	25	5000
4	Pesticides	liter	3	250	750	3	250	750
5	Equipment and fuel costs				20645			22640
6	Hand labor	day	16	500	8000	15	500	7500
7	Payment for irrigation water	ha	1x3	216	650	1x3	216	650
8	Transport costs	travel	5	500	2500	5	500	2500
9	Taxes and social charges	som			560			560
10	Total costs (amount 2..9)	som			38105			39600
11	Productivity	c/ha	1	250	250			
12	Gross yield	kg	25000	4,5	112500	22400	4,5	100800
13	Profit	som			64395			51200
14	Difference in profit	som			+13195			
15	Irrigation water volume for whole period m³	m ³			1800			2000
16	Irrigation water saving	m ³			200			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **13195** SOM, and saving of irrigation water made **1800 m³** per ha.

Economic analysis

WUA «Orton». Kum-Dobo v., Kochkor rayon, Naryn oblast

Demo farmer: Beishenkulov Kushbek.

Control plot. Farmer: A. Jamangulov

Crop: Potato

№	Name	Unit of measure	Water-saving method 2nd furrow irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price som	Total amount som	Q-ty	Unit price som	Total amount som
1	Area	ha	1			1		
2	Seeding rate							
3	Fertilizers	kg	200	22	4400	200	22	4400
4	Pesticides	liter	2	250	500	2	250	500
5	Equipment and fuel costs				14110			13200
6	Hand labor				6500			6500
7	Payment for irrigation water	ha	1x3	170	510	1x3	170	510
8	Transport costs	travel	2	600	1200	2	400	800
9	Taxes and social charges	som			430			430
10	Total costs (amount 2..9)	som			27650			26340
11	Productivity	c/ha	1	230	230	1	210	210
12	Gross yield	som	23000	5-00	115000	1	5-00	105000
13	Profit	som			87350			78660
14	Difference in profit	som			+8690			
15	Irrigation water volume for whole period m³	m ³			2000			2400
16	Irrigation water saving	m ³			400			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **8690** SOM, and saving of irrigation water made **400 m³** per ha.

Economic analysis

WUA «Kyzyl-Zoo-Dostuk». Naryn rayon, Naryn oblast

Demo farmer: Mambetaliev Taalaibek.

Control plot. Farmer: A. Musaev

Crop: Vegetables

№	Name	Unit of measure	Water-saving method Drip irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price som	Total amount som	Q-ty	Unit price som	Total amount som
1	Area	ha	0,20					
2	Seeding rate	pack	1	1500	1500	1	1500	1500
3	Fertilizers	kg	50	22	1100			-
4	Pesticides	liter	1	250	250			-
5	Equipment and fuel costs				2220			2934
6	Hand labor	day	3	180	720	4	200	800
7	Payment for irrigation water	ha	0,20x5	238	238	0,20x5	238	238
8	Transport costs	travel	2	500	1000	2	500	1000
9	Taxes and social charges	som			78			78
10	Total costs (amount 2..9)	som			7100			6550
11	Productivity	c/ha	0,20	325	65	0,20	250	50
12	Gross yield	kg	6500	10-00	65000	5000	10-00	50000
13	Profit	som			57900			43300
14	Difference in profit	som			+14600			
15	Irrigation water volume for whole period m³	m ³			640			960
16	Irrigation water saving	m ³			320			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **3200 SOM**, and saving of irrigation water made **320 m³** per **0.20 ha**.

Economic analysis

WUA «Orto-Keltebek». Kyzyl-Tuu v., At-Bashy rayon, Naryn oblast

Demo farmer: Kadyrov Melis.

Control plot. Farmer: E. Asanov

Crop: Springbarley

№	Name	Unit of measure	Water-saving method Short furrow irrigation			Traditional method Free-flow irrigation		
			Q-ty	Unit price som	Total amount som	Q-ty	Unit price som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	kg	220	24	5280	220	24	5280
3	Fertilizers				750			-
4	Pesticides				250			-
5	Equipment and fuel costs				1088			1038
6	Hand labor				-			-
7	Payment for irrigation water				250			250
8	Transport costs	travel	1	400	400	1	400	400
9	Taxes and social charges				382			382
10	Total costs (amount 2..9)				8500			7350
11	Productivity	c/ha	1	33	33	1	25	25
12	Gross yield	som	3300	6-00	19800	2500	6-00	15000
13	Profit	som			11300			7650
14	Difference in profit				+3650			
15	Irrigation water volume for whole period m³	m ³			1000			1200
16	Irrigation water saving	m ³			200			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **3650 SOM**, and saving of irrigation water made **200 m³** per ha

Economic analysis

WUA «Eldik». Chym-Korgon v., Kemin rayon, Chui oblast

Demo farmer: Medetov Beishen.

Control plot. Farmer: A. Abikov

Crop: Corn

№	Name	Unit of measure	Water-saving method 2nd furrow irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	kg	25	50	1250	25	50	1250
3	Fertilizers	kg	500	24	10000	300	24	7200
4	Pesticides	liter	3	250	750	3	250	750
5	Equipment and fuel costs				9002			9002
6	Hand labor	day	2	600	1200	2	600	1200
7	Payment for irrigation water	ha	1x3	330	990	1x3	330	990
8	Transport costs	travel	3	500	1500	3	500	1500
9	Taxes and social charges	som			708			708
10	Total costs (amount 2..9)	som			25400			22600
11	Productivity	c/ha	1	72	72	1	65	65
12	Gross yield	kg	7200	10	72000	6500	10-00	65000
13	Profit	som			46600			42400
14	Difference in profit	som			+4200			
15	Irrigation water volume for whole period m³	m ³			3000			3600
16	Irrigation water saving	m ³			600			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **4200** SOM, and saving of irrigation water made **600 m³** per ha.

Economic analysis

WUA "Novaia Zemlia". Sokuluk rayon, Chui oblast

Demo farmer: Altykeev Sultan.

Control plot. Farmer: T. Suerkulov

Crop: Sugar beetle

№	Name	Unit of measure	Water-saving method Short furrow irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	pack	1	6300	6300	1	6300	6300
3	Fertilizers	kg	600	22	13200	500	22	11000
4	Pesticides	liter	4	300	1200	4	300	1200
5	Equipment and fuel costs				82828			56728
6	Hand labor	day	1x20	600	12000	1x20	600	12000
7	Payment for irrigation water	ha	1x5	230	1150	1x5	230	1150
8	Transport costs	travel	5	5000	25000	4	4000	16000
9	Taxes and social charges	som			822			822
10	Total costs (amount 2..9)	som			142500			105200
11	Productivity	c/ha	1	1090	1090	1	825	825
12	Gross yield	kg	109000	3.4	327000	82500	3,4	280500
13	Profit	som			184500			175300
14	Difference in profit	som			+9200			
15	Irrigation water volume for whole period m³	m ³			3000			3500
16	Irrigation water saving	m ³			500			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **9200 SOM**, and saving of irrigation water made **500 m³** per ha.

Economic analysis

WUA «Narboto-Suu». Moskva rayon, Chui oblast

Demo farmer: O. Zheenaliev

Control plot. Farmer: S .Ismanov

Crop: Vegetables

№	Name	Unit of measure	Water-saving method Drip irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	0,20			0,20		
2	Seeding rate	pack	1	1500	1500	1	1500	1500
3	Fertilizers	kg	50	24	12000	50	24	12000
4	Pesticides	liter	1	250	250	1	250	250
5	Equipment and fuel costs				15500			14800
6	Hand labor	day	1x5	400	2000	1x5	400	2000
7	Payment for irrigation water	ha	0,20x6	232	278	0,20x10	232	464
8	Transport costs	travel	2	500	1000	2	500	1000
9	Taxes and social charges	som			784			784
10	Total costs (amount 2..9)	som			32812			32798
11	Productivity	ha	0,20	320	64	0,20	265	53
12	Gross yield	kg	6400	15-00	96000	5300	15-00	79500
13	Profit	som			63188			46702
14	Difference in profit	som			+16486			
15	Irrigation water volume for whole period m³	m ³			520			800
16	Irrigation water saving	m ³			280			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **16486** SOM, and saving of irrigation water made **280 m³** per **0.20** ha.

Economic analysis

WUA «March-2001». Kyzyl-Dyikan v/c, Jaiyl rayon, Chui oblast

Demo farmer: Zykrin Ivan.

Control plot. Farmer: M. Satybaldiev

Crop: Sugar beetle

№	Name	Unit of measure	Water-saving method Short furrow irrigation			Traditional method Long furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	pack	1	6300	6300	1	6300	6300
3	Fertilizers	kg	600	24	14400	500	24	12000
4	Pesticides	liter	4	250	1000	4	250	1000
5	Equipment and fuel costs				36782			39782
6	Hand labor	day	1x20	600	12000	1x20	600	12000
7	Payment for irrigation water	ha	1x5	232	1160	1x5	232	1160
8	Transport costs	travel	5	4000	20000	4	4000	16000
9	Taxes and social charges	som			658			658
10	Total costs (amount 2..9)	som			92300			88900
11	Productivity	c/ha	1	975	975	1	860	860
12	Gross yield	kg	97500	3,4	331500	86000	3,4	292400
13	Profit	som			239200			203500
14	Difference in profit	som			+35700			
15	Irrigation water volume for whole period m³	m ³			3200			3600
16	Irrigation water saving	m ³			400			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **35700** SOM, and saving of irrigation water made **400 m³** per ha.

Economic analysis

WUA «Jaiylma-Lux». Luxemburg v., Ysyk-Ata rayon, Chui oblast

Demo farmer: R. Jalpiev

Control plot. Farmer: K. Baiserkeev

Crop: Corn

№	Name	Unit of measure	Water-saving method 2nd furrow irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	kg	25	50	1250	25	50	1250
3	Fertilizers	kg	400	22	8800	400	22	8800
4	Pesticides	liter	3	330	990	3	330	990
5	Equipment and fuel costs				15705			13055
6	Hand labor	day	1x5	600	3000	1x5	600	3000
7	Payment for irrigation water	ha	1x3	235	705	1x3	235	705
8	Transport costs	travel	2	600	1200	2	600	1200
9	Taxes and social charges	som			800			800
10	Total costs (amount 2..9)	som			32450			29800
11	Productivity	c/ha			750			690
12	Gross yield	kg	7500	10	75000	6900	10-00	69000
13	Profit	som			42550			39200
14	Difference in profit	som			+3350			
15	Irrigation water volume for whole period m³	m ³			2800			3200
16	Irrigation water saving	m ³			400			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **3350 SOM**, and saving of irrigation water made **400 m³** per ha.

Economic analysis

WUA «Bolkuldok-Suu». Kozuchak v., Talas rayon, Talas oblast

Demo farmer: A. Kokoev

Control plot. Farmer: M. Karagulov

Crop: Vegetables

№	Name	Unit of measure	Water-saving method Drip irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	0,20			0,20		
2	Seeding rate	pack	1	1500	1500	1	1500	1500
3	Fertilizers	kg	50	24	1200	40	24	960
4	Pesticides	liter	2	250	500	2	250	500
5	Equipment and fuel costs				15500			14600
6	Hand labor	day	3x10	600	18000	3x10	600	18000
7	Payment for irrigation water	ha	0,20x5	268	268	0,20x5	268	268
8	Transport costs	travel	4	500	2000	4	500	2000
9	Taxes and social charges				594			594
10	Total costs (amount 2..9)	som			39562			38422
11	Productivity	c/ha	0,20	450	90	0,20	410	82
12	Gross yield	kg	9000	15	135000	8200	15-00	123000
13	Profit	som			95438			84578
14	Difference in profit	som			+10860			
15	Irrigation water volume for whole period m³	m ³			480			840
16	Irrigation water saving	m ³			360			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **10860** SOM, and saving of irrigation water made **360 m³** per **0.20** ha.

Economic analysis

WUA «Mol-Bulak». Chymgent v/c, Kara-Buurun rayon, Talas oblast

Demo farmer: K. Salzhonov

Control plot. Farmer: M. Saparbekov

Crop: Bean

№	Name	Unit of measure	Water-saving method Short furrow irrigation			Traditional method Long furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	kg	80	40	3200	80	40	3200
3	Fertilizers	kg	200	24	4800	150	24	3600
4	Pesticides	liter	2	250	500	2	250	500
5	Equipment and fuel costs				12598			11248
6	Hand labor	day	5x5	200	5000	5x5	200	5000
7	Payment for irrigation water	ha	1x4	238	952	1x4	238	952
8	Transport costs	travel	2	500	1000	2	500	1000
9	Taxes and social charges	som			700			700
10	Total costs (amount 2..9)	som			28750			26200
11	Productivity	c/ha	1	14,5	14,5	1	12,5	12,5
12	Gross yield	kg	1450	50	72500	1250	50-00	62500
13	Profit	som			43750			36300
14	Difference in profit	som			+7450			
15	Irrigation water volume for whole period m³	m ³			2800			3200
16	Irrigation water saving	m ³			400			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **7450 SOM**, and saving of irrigation water made **400 m³** per ha.

Economic analysis

WUA «Kurama-Tor». Boo-Terek v., Bakay-Ata rayon, Talas oblast

Demo farmer: D. Akmatov

Control plot. Farmer: K. Akmatov

Crop: Bean

№	Name	Unit of measure	Water-saving method 2nd furrow irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1					
2	Seeding rate	kg	80	50	4000	80	50	4000
3	Fertilizers	kg	100	22	2200	80	22	1760
4	Pesticides	liter	2	250	500	2	250	500
5	Equipment and fuel costs				15119			15809
6	Hand labor	day	2x5	200	2000	2x5	200	2600
7	Payment for irrigation water	ha			540			540
8	Transport costs	travel	2	600	1200	2	600	1200
9	Taxes and social charges	som			636			636
10	Total costs (amount 2..9)	som			26195			27045
11	Productivity	c/ha	1	14	14	1	13,5	13,5
12	Gross yield	kg	1400	50	70000	1350	50	67500
13	Profit	som			43805			40455
14	Difference in profit	som			+3350			
15	Irrigation water volume for whole period m³	m ³			3240			4100
16	Irrigation water saving	m ³			860			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **3350** SOM, and saving of irrigation water made **860 m³** per ha.

Economic analysis

WUA «Dyikan». May v/c, Manas rayon, Talas oblast

Demo farmer: K. Naizabekov

Control plot. Farmer: S. Bazarkulov

Crop: Corn

№	Name	Unit of measure	Water-saving method 2nd furrow irrigation			Traditional method Furrow irrigation		
			Q-ty	Unit price, som	Total amount som	Q-ty	Unit price, som	Total amount som
1	Area	ha	1			1		
2	Seeding rate	kg	25	50	1250	25	50	1250
3	Fertilizers	kg	200	22	4400	150	24	3600
4	Pesticides	liter	3	250	750	3	250	750
5	Equipment and fuel costs				8638			9438
6	Hand labor	day	1x10	300	3000	1x10	300	3000
7	Payment for irrigation water	ha	1x4	100	400	1x5	120	600
8	Transport costs	travel	2	600	1200	2	600	1200
9	Taxes and social charges	som			662			662
10	Total costs (amount 2..9)	som			20300			20500
11	Productivity	c/ha	1	42,8	42,8	1	42	42
12	Gross yield	som	4280	13	55640	4200	13	54600
13	Profit	som			35340			34100
14	Difference in profit	som			+1240			
15	Irrigation water volume for whole period m³	m ³			3300			3600
16	Irrigation water saving	m ³			300 m3			

It is seen from the table that profit from the demonstration plot in comparison with the control plot is more for **1240 SOM**, and saving of irrigation water made **300 m³** per ha.

Economic analysis

WUA «Maz-Aikal». Otuz-Adyr v/c, Karasuu rayon, Osh oblast

Demo farmer: A.Omurzakov

Control plot. Farmer: A. Kurbanov

Crop: Corn

№	Indicators	Irrigation by furrows	At water-saving irrigation (short furrows)
1	Area, ha	0,3	0,9
2	Planting date	20.04.2016	20.04.2016
3	Irrigation date	10.05.2016	10.05.2016
4	Last irrigation date	15.08.2016	15.08.2016
5	Water volume for 1 irrigation, m ³	1255	1229
6	Number of irrigation, times	6	5
7	Water volume for whole period, m ³	2259	6147
8	Irrigation rate, m ³ /ha	7530	6830
9	Costs for irrigation water, som/ha	1100	1100
10	Human labor costs for irrigation, men*hour	20	16
11	Human labor costs, som/ha	8000	6400
12	Production costs (seedlings, plowing, planting, and other works), som	35400	37500
13	General production costs	44500	45000
14	Productivity, c/ha	61	65
15	Gross collection, kg	6100	6500
16	Price, som/kg	12	12
17	Gross income, som	73200	78000
18	Costs, som	44500	45000
19	Profit, som	28700	33000
20	Difference in profit, som		4300
21	Water saving, m³		700

Economic analysis

WUA «Abshyr-Tany». Kok-Jar v/c, Nookat rayon, Osh oblast

Demo farmer: R. Djoroev

Control plot. Farmer: A. Djoroev

Crop: Corn

№	Indicators	Irrigation by furrows	At water-saving irrigation (short furrows)
1	Area, ha	0,5	1
2	Planting date	01.04.2016	01.04.2016
3	Irrigation date	08.04.2016	10.04.2016
4	Last irrigation date	14.08.2016	12.08.2016
5	Water volume for 1 irrigation, m ³	629	804
6	Number of irrigation, times	6	6
7	Water volume for whole period, m ³	3774	4824
8	Irrigation rate, m ³ /ha	7548	4824
9	Costs for irrigation water, som/ha	1100	1100
10	Human labor costs for irrigation, men*hour	16	16
11	Human labor costs, som/ha	6400	6400
12	Production costs (seedlings, plowing, planting, and other works), som	36400	40700
13	General production costs	43900	48200
14	Productivity, c/ha	62	75
15	Gross collection, kg	6200	7500
16	Price, som/kg	15	15
17	Gross income, som/ha	93000	112500
18	Total costs, som/ha	43900	48200
19	Profit, som/ha	49100	64300
20	Difference in profit, som/ha		15200
21	Water saving m³/ha		2724

Economic analysis

WUA «Altyn-Kol-Bakmal». Don-Bulak v/c, Uzgen rayon, Osh oblast

Demo farmer: B. Kamalov

Control plot. Farmer: R. Kamalov

Crop: Corn

№	Indicators	Irrigation by furrows	At water-saving irrigation (short furrows)
1	Area, ha	0,2	1,04
2	Planting date	15.04.2016	15.04.2016
3	Irrigation date	15.05.2016	15.05.2016
4	Last irrigation date	20.08.2016	20.08.2016
5	Water volume for 1 irrigation, m ³	245	1091
6	Number of irrigation, times	6	6
7	Water volume for whole period, m ³	1468	6550
8	Irrigation rate, m ³ /ha	7340	6300
9	Costs for irrigation water, som/ha	1000	1000
10	Human labor costs for irrigation, men*hour	21	21
11	Human labor costs, som/ha	8500	8500
12	Production costs (seedlings, plowing, planting, and other works), som	35000	36000
13	General production costs	44500	45500
14	Productivity, c/ha	65	66
15	Gross collection, kg	6500	6600
16	Price, som/kg	12	12
17	Gross income, som/ha	78000	79200
18	Total costs, som/ha	44500	45500
19	Profit, som/ha	33500	33700
20	Difference in profit, som		200
21	Water saving, m³/ha		1040

Economic analysis

WUA «Sokhi-Darie». Chek-Abad v/c, Aravan rayon, Osh oblast

Demo farmer: M. Ismanov

Control plot. Farmer: S. Ismanov

Crop: Rice

№	Indicators	Check irrigation	Furrow irrigation
1	Area, ha	0,3	0,3
2	Planting date	14.06.2016	20.06.2016
3	Irrigation date	14.06.2016	22.06.2016
4	Last irrigation date	03.10.2016	02.10.2016
5	Water volume for 1 irrigation, m ³		1091
6	Number of irrigation, times		31
7	Water volume for whole period, m ³	14490	5579
8	Irrigation rate, m ³ /ha	48300	18598
9	Costs for irrigation water, som/ha	1300	1300
10	Human labor costs for irrigation, men*hour	24	4
11	Human labor costs, som/ha	12000	2000
12	Production costs (seedlings, plowing, planting, and other works), som/ha	39250	35690
13	General production costs	52550	38990
14	Productivity, c/ha	42	45
15	Gross collection, kg	4200	4500
16	Price, som/kg	40	40
17	Gross income, som/ha	168000	180000
18	Total costs, som/ha	52550	38990
19	Profit, som/ha	115450	141010
20	Difference in profit, som/ha		25560
21	Water saving, m ³ /ha		29702

Economic analysis

WUA "Jany-Aryk". Toloikon v/c, Karasuu rayon, Osh oblast

Demo farmer: M. Bakirov

Control plot. Farmer: M. Bakirov

Crop: Cucumber

№	Indicators	Irrigation by furrows	Drip irrigation
1	Area, ha	0,1	0,35
2	Planting date	15.07.2016	15.07.2016
3	Irrigation date	15.07.2016	15.07.2016
4	Last irrigation date	05.10.2016	05.10.2016
5	Water volume for 1 irrigation, m ³	56	12
6	Number of irrigation, times	10	25
7	Water volume for whole period, m ³	560	300
8	Irrigation rate, m ³ /ha	5600	860
9	Costs for irrigation water, som/ha	800	800
10	Human labor costs for irrigation, men*hour	20	6
11	Human labor costs, som/ha	8000	2400
12	Production costs (seedlings, plowing, planting, and other works), som	40000	40000
13	System value, som		102706
14	Amortization 30%		33892
15	Other costs		2000
16	General production costs	48800	79092
17	Productivity, c/ha	250	420
18	Gross collection, kg	25000	42000
19	Price, som/kg	20	20
20	Gross income, som/ha	500000	840000
21	Total costs, som/ha	48800	79092
22	Profit, som/ha	451200	760908
23	Difference in profit, som/ha		309708
24	Water saving, m ³		4740

Economic analysis

WUA «Kara-Dobo». Masaliev v/c, Kadamjay rayon, Batken oblast

Demo farmer: A. Aliev

Control plot. Farmer: A. Aliev

Crop: Onion

№	Indicators	Irrigation by furrows	At water-saving irrigation (short furrows)
1	Area, ha	0,5	0,75
2	Planting date	20.03.2016	20.03.2016
3	Irrigation date	20.04.2016	20.04.2016
4	Last irrigation date	15.08.2016	15.08.2016
5	Water volume for 1 irrigation, m ³	500	695
6	Number of irrigation, times	11	11
7	Water volume for whole period, m ³	5500	7650
8	Irrigation rate, m ³ /ha	11000	10200
9	Costs for irrigation water, som/ha	4000	4000
10	Human labor costs for irrigation, men*hour	30	30
11	Human labor costs, som/ha	120000	120000
12	Production costs (seedlings, plowing, planting, and other works), som	55000	55000
13	General production costs	179000	179000
14	Productivity, c/ha	300	360
15	Gross collection, kg	30000	36000
16	Price, som/kg	11	11
17	Gross income, som	330000	396000
18	Total costs, som	179000	179000
19	Profit, som	151000	217000
20	Difference in profit, som		66000
21	Water saving m³		800

Economic analysis

WUA «Kosh-Kol». Kara-Bak v/c, Batken rayon, Batken oblast

Demo farmer: O. Toksonov

Control plot. Farmer: A. Muratov

Crop: Apricot transplant

№	Indicators	Irrigation by furrows	Drip irrigation
1	Area, ha	1	1
2	Planting date	10.03.2016	10.03.2016
3	Irrigation date	20.06.2016	15.07.2016
4	Last irrigation date	15.10.2016	15.10.2016
5	Water volume for 1 irrigation, m ³	1300	5
6	Number of irrigation, times	5	16
7	Water volume for whole period, m ³	6500	80
8	Irrigation rate, m ³ /ha	6500	80
9	Costs for irrigation water, som/ha	817	817
10	Human labor costs for irrigation, men*hour	25	16
11	Human labor costs, som/ha	10000	6400
12	Production costs (seedlings, plowing, planting, and other works), som	15000	15000
13	System value, som		105518
14	Other costs		3000
15	General production costs	25817	130735
16	Transplants root-taking, %	95	98
17	Productivity, c/ha		
18	Gross collection, kg		
19	Price, som/kg		
20	Gross income, som		
21	Total costs, som	25800	130718
22	Profit, som		
23	Water saving m ³		6420

Economic analysis

WUA «Shaidan Kara-Unkur». Shaidan v/c, Nookan rayon, Jalal-Abad oblast

Demo farmer: O. Jambilov

Control plot. Farmer: O. Jambilov

Crop: Tomato

№	Indicators	Irrigation by furrows	Drip irrigation
1	Area, ha	0,1	0,2
2	Planting date	15.04.2016	15.04.2016
3	Irrigation date	15.05.2016	15.05.2016
4	Last irrigation date	20.08.2016	20.08.2016
5	Water volume for 1 irrigation, m ³	64	18
6	Number of irrigation, times	10	15
7	Water volume for whole period, m ³	642	270
8	Irrigation rate, m ³ /ha	6420	1350
9	Costs for irrigation water, som/ha	1130	1130
10	Human labor costs for irrigation, men*hour	20	15
11	Human labor costs, som/ha	8000	8000
12	Production costs (seedlings, plowing, planting, and other works), som/ha	15000	15000
13	System value, som		120155
14	Amortization 30%		39650
15	Pump work time for season, hour		15
16	Electricity costs for season, kilowatt		15
17	Electricity costs for season, som		10,5
18	General production costs	24130	63790,5
19	Productivity, c/ha	300	330
20	Gross collection, kg	30000	33000
21	Price, som/kg	15	15
22	Gross income, som/ha	450000	495000
23	Totalcostssom/ha	24130	63790
24	Profit, som/ha	425870	431210
25	Difference in profit, som		5340
26	Water saving, m³		5070

Economic analysis

WUA «Kenesh-Suu». Kenesh v/c, Bazar-Korgon rayon, Jalal-Abad oblast

Demo farmer: A. Narmatov

Control plot. Farmer: A. Narmatov

Crop: Cotton

№	Indicators	Irrigation by furrows	At water-saving irrigation (short furrows)
1	Area, ha	0,5	0,8
2	Planting date	20.04.2016	20.04.2016
3	Irrigation date	05.06.2016	05.06.2016
4	Last irrigation date	20.08.2016	20.08.2016
5	Water volume for 1 irrigation, m ³	832	1280
6	Number of irrigation, times	5	5
7	Water volume for whole period, m ³	4160	6400
8	Irrigation rate, m ³ /ha	8320	8000
9	Costs for irrigation water, som/ha	700	700
10	Human labor costs for irrigation, men*hour	30	30
11	Human labor costs, som/ha	12000	12000
12	Production costs (seedlings, plowing, planting, and other works), som	32500	32500
13	General production costs	45200	45200
14	Productivity, c/ha	33	35
15	Gross collection, kg	3300	3500
16	Price, som/kg	40	40
17	Gross income, som	132000	140000
18	Total costs, som	45200	45200
19	Profit, som	86800	94800
20	Difference in profit, som		8000
21	Water saving, m³		320

Economic analysis

WUA «Tushum-Suu». Taigaraev v/c, Suzak rayon, Jalal-Abad oblast

Demo farmer: Sh. Murzakunov

Control plot. Farmer: Sh. Murzakunov

Crop: Corn

№	Indicators	Irrigation by furrows	At water-saving irrigation (short furrows)
1	Area, ha	1	1,3
2	Planting date	25.04.2016	25.04.2016
3	Irrigation date	15.06.2016	15.06.2016
4	Last irrigation date	25.08.2016	25.08.2016
5	Water volume for 1 irrigation, m ³	1812	2119
6	Number of irrigation, times	4	4
7	Water volume for whole period, m ³	7250	8476
8	Irrigation rate, m ³ /ha	7250	6520
9	Costs for irrigation water, som/ha	1100	1100
10	Human labor costs for irrigation, men*hour	20	20
11	Human labor costs, som/ha	8000	8000
12	Production costs (seedlings, plowing, planting, and other works), som	24500	24500
13	General production costs	33600	33600
14	Productivity, c/ha	60	60
15	Gross collection, kg	6000	6000
16	Price, som/kg	15	15
17	Gross income, som	90000	90000
18	Total costs, som	33600	33600
19	Profit, som	56400	56400
20	Difference in profit, som		
21	Water saving, m³		730

9. PROJECT SUCCESS

1. More than 1500 farmers through training and field days and more than 10000 farmers through the various media received informed about various water-saving irrigation technologies and agricultural techniques on demoplots and their effectiveness.
2. All demo farmers got good skills on using DIS and water measuring devices (weir Chipoletti, Thomson, etc.), gained knowledge on water-saving technologies and are ready to further consult and provide practical assistance to other interested farmers.
3. Demo farmers learned to determine watering time with the help of soil moisture tester.
4. There is active participation and collaboration between local WUA, RSD and OSD;
5. There is great interest of farmers in innovative technologies and desire to increase the number of demoplots in each rayon;

10. PROBLEMS

1. Trainings and workshops were held in very late, which affected the activity and quality of the activities. Equipment and materials for DP were provided late. Therefore, in the future it is necessary to begin work under this project in the early stages before the start of irrigation season.
2. On demoplot in Spartak v. of Moskva rayon, WUA «Narboto-Suu» where drip irrigation system (DIS) was installed on the area of 0.2 hectares (farmland) due to incorrect installation of a stand of timber struts and boards, on which a tank with capacity of 3 m³ was installed, has been completely collapsed unable to bear such load. As a result of fall of the tank and connecting pipes with filter were completely damaged and fell into disrepair. After submission of claims of the WUA chairperson and request to PIU of Water Department, an organization that has installed the equipment had to replace the tank with volume of 1 m³ and connection pipes.
3. On demoplot in Jan-Bulak v. of Naryn rayon WUA «Kyzyl-Zoo Dostuk» after installation of DIS at the same night there was a strong gusty wind, bringing the installed 3 m³ tank down on the ground and completely damaged it. Then, demo farmer of this plot on his own initiative, installed a new reservoir of smaller volume, which was used until the end of irrigation season and is suitable for further use.
4. On demoplot in Kozuchak v. of Talas rayon WUA «Bolkuldok-Suu» during training, the training participants negligently broke off starter cable of water pump engine. During field day at the plot, which was attended by representatives of the project: Olof Verheyen – international WUA specialist, and NWMP-3 component coordinator K. Zhaanbaev, this demo farmer could not start the

water pump engine. As a result, for further irrigations the demo farmer had to rent a water pump from his neighbor that he used until the end of irrigation period.

5. During trainings and field days due to large amount of precipitation in many regions, there was no irrigation water in the irrigation system. For this reason, demonstration of water measuring devices was performed visually and water flow was calculated arbitrarily.

6. Conducting field days coincided with crop harvesting time (especially in Talas oblast - bean harvesting). For this reason, many farmers took part in these activities with delay for 1-2 hours.

7. In some places during the project activities, there was the lack of population awareness because of poor contact with the local self-government representatives and rayon ADA and with media representatives.

8. Duration of trainings for local advisors were insufficient (2 days).

9. Local authorities did not take active part in mobilization of farmers.

11. RECOMMENDATIONS

1. Theoretical training is desirable to carry out in winter:

- ✚ Water-saving irrigation methods and irrigation water metering;

- ✚ Advanced technology of crop cultivation.

2. Increase the number of field days, taking into account terms of vegetative irrigation:

- ✚ Water-saving irrigation technologies and practical demonstration of water metering methods;

- ✚ Advanced agro-technical activities using organic-mineral fertilizers at irrigations, weeds, plant pests and diseases control measures.

3. Conduct experiments on adoption of advanced technologies of crop cultivation on all demoplots. For example, methods Sherbet-suu, Shirin-suu, use of “Kyrgyz-Humate”, etc.

4. Create a stable group from farmers who have received training, to improve the efficiency of work in this area and involvement of a larger number of participants in further work on adoption of advanced irrigation technologies, agro-techniques of cultivation and DIS.

5. Continue further training in the territory of established demoplots for WUA members and farmers of rayon on adoption of water-saving irrigation technologies and advanced crop cultivation technology.

6. Increase the number of demoplots with optimal area (DIS 0.02-0.10 ha) in the country for more extensive coverage of farmers for the purpose of effective and productive use of irrigation water and adoption of advanced crop cultivation technology.

7. To implement the project more effectively and sustainably, there is necessary close OSDeration with local WUA and local governments, RSD and OSD, and rayon ADAof each region.

8. Equipment shall be purchased before the start of growing season (before April);

9. Conduct ToT for local WUA advisors, experts and RSD (on topics of agronomy, irrigation and establishment of DP).

10. Show only one water-saving technology on each DP;

11. Increase the number of trainings and topics on DP;

12. Demo farmers should also contribute, for example, purchase of drip irrigation pump and tank.

Certificates for drip irrigations systems

SERTİFİKA

TÜV
AUSTRIA

TS EN ISO 9001:2008 Yönetim Sistemi

SENKRON PLASTİK İNŞAAT TEKSTİL SAN. VE TİC. A.Ş.
21. Cad. 1424. Sok. No:6/3 Mega Center
TR-06370 OSTİM / ANKARA

Yukarıda belirtilen kuruluş TÜV AUSTRIA CERT prosedürlerine göre standart şartlarını karşıladığını kanıtlamıştır.

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**Polietilen boru bağlantı parçaları, damlama sulama
Boru ve ek parçaları ve vana kutuları üretimi ve satışı.**

Sertifika Kayıt No: 20 100 65013263

2017-05-14 tarihine kadar geçerlidir,
ilk Belgelendirme 2005-04-12

Belgelendirme Kuruluşu
TÜV AUSTRIA CERT GMBH

Viyana, 2014-05-12

Belgelendirme TÜV AUSTRIA CERT tetkik ve belgelendirme prosedürlerine uygun olarak gerçekleştirilmiştir ve düzenli gözetim denetimlerine tabidir.

TÜV AUSTRIA CERT GMBH Krugerstraße 16 A-1015 Wien www.tuv.at

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КЫРГЫЗСКАЯ РЕСПУБЛИКА



СЕРТИФИКАТ СООТВЕТСТВИЯ

KG 417/OC.БЦИСМ.1.KG.01.11280

411654

Срок действия

с 13 марта 2015 г. по 13 марта 2016 г.

Орган по сертификации Бишкекский центр испытаний, сертификации и метрологии ЦСМ при МЭ Кыргызской Республики № KG 417/OC.БЦИСМ.1 г. Бишкек ул. Панфилова 197 тел. (312) 66-19-70

Продукция (услуги) Емкости цилиндрические из полиэтилена для пищевых продуктов, ТНВЭД 3923309090, серийное производство

Соответствует требованиям: ГОСТ Р 50962-96 Изм. 1 п. 3.8 табл. 1 поз. П.4, КМС 868:2002 п. 4.6

Производитель: ОсОО «Бивтор», Кыргызская Республика, г. Бишкек, 10 мкр., 10-64,

Сертификат выдан: ОсОО «Бивтор», г. Бишкек, 10 мкр., 10-64, ОКПО 24558422, ИНН 02211200710059

На основании: Поток испытаний № 299 от 05.03.2015г. Лаборатории испытаний ТНП и ТУ БЦИСМ № KG17/КЦА ИЛ.025 от 17.05.2013 г. Акта № 102-0161 от 13.03.2015 г. ОС БЦИСМ

Дополнительная информация: Инспекционный контроль осуществляет ОС БЦИСМ

Заявитель (производитель, продавец) несет ответственность за соответствие реализуемой продукции (услуги) требованиям нормативных правовых актов, указанных в настоящем сертификате

Руководитель органа по сертификации

Соороноев Эркин Керимбаевич
инициала, фамилия

подпись

М.П.

Эксперт

Петрухина Наталья Николаевна
инициала, фамилия

подпись



QUALITY MANAGEMENT SYSTEM CERTIFICATE

Universal GmbH
Certification Services

This certificate is granted to the organization,

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VKN: 7610349430

by review of SA1.002370 numbered report for the scope

MANUFACTURE AND SALES OF PLASTIC PIPE

to certify that a quality management system in accordance with
standard's clauses is established and being implemented

DIN EN ISO 9001:2008

Certificate No : QMS 0711 002317

Date of Issue : 2014-07-24

Expiry Date : 2016-07-23

Certificate Period : 3 years (2nd year)



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D-ZM-18058-01-00

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Universal GmbH
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VKN: 7610349430

kuruluşunun,

PLASTİK BORU İMALATI VE SATIŞI

kapsamında, SA1.002370 sayılı rapordaki inceleme ile

DIN EN ISO 9001:2008

standardının şartlarına uyan bir kalite yönetim sistemi
kurduğunu ve uyguladığını onaylamak üzere verilmiştir.

Sertifika No : QMS 0711 002317

Yayın Tarihi : 2014-07-24

Geçerlilik Tarihi : 2016-07-23

Belge Periyodu : 3 yıl (2.yıl)



Deutsche
Akkreditierungsstelle
D-ZM-16058-01-00

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КЫРГЫЗСКАЯ РЕСПУБЛИКА



407556

СЕРТИФИКАТ СООТВЕТСТВИЯ

KG 417/OC БЦИСМ.1.KG.01.09832

Срок действия

с 03 сентября 2014 г по 03 сентября 2015 г.

Орган по сертификации: Бишкекский центр испытаний, сертификации и метрологии ЦСМ при МО Кыргызской Республики № KG-417/OC БЦИСМ.1 г. Бишкек ул. Панфилова-197 тел. (312) 66-19-70

Продукция (услуги): Трубы напорные технические из полиэтилена согласно приложения на листе(их) серийное производство

Соответствует требованиям: ГОСТ 18599-2001 п. 5.2 табл. 1 паз. 1, 5.4.7, КМС 868-2002 п. 4.6

Производитель: ОсОО «Бистор», Кыргызская Республика, г. Бишкек, 10 мкр., 10-64

Сертификат выдан: ОсОО «Бистор», г. Бишкек, 10 мкр., 10-64, ОКПО 24558422, ИНН 02211200710059

На основании: Протокол испытаний № 102-1022 от 02.09.2014г. ОС БЦИСМ № KG17/K14 ОСИ.п. У.019 от 11.09.2013 г. Акта ОС БЦИСМ от 03.09.2014 г.

Дополнительная информация: Инспекционный контроль осуществляет ОС БЦИСМ

Заявитель (производитель, продавец) несет ответственность за соответствие реализуемой продукции (услуги) требованиям нормативных правовых актов, указанных в настоящем сертификате.

Руководитель органа по сертификации: Сооронбаев Эркин Керимбаевич

М.П.

Эксперт: Петрухина Наталья Николаевна

(Signature)
подпись

ПРИЛОЖЕНИЕ № 1

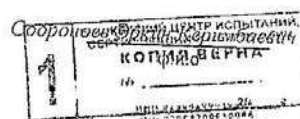
к сертификату соответствия № KG 417/019. KG. 01.09832 бланк № 407556

Перечень конкретной продукции,
на которую распространяется действие сертификата соответствия

№	Код ТН ВЭД	Наименование и обозначение продукции, ее изготовитель	Кол-во, единица измерения
		ОсОО «Бивтор», Кыргызская Республика, г.Бишкек, 10 мкр., 10-64, Трубы напорные технические из полиэтилена	
1	3917221000	SDR17.6 (Д=25мм, 32мм, 40мм, 50мм, 63мм, 75мм, 90мм, 100мм)	
2	3917221000	SDR11 (Д=20мм, 25мм, 32мм, 40мм, 50мм, 63мм, 75мм, 90мм, 110мм)	

Руководитель органа по сертификации

03 сентября 2014 г.


 подпись


Training program
of pilot WUA farmers on NWM project:
**“Establishment and exploitation of demonstration
plots and provision of trainings”**

- **Name:** «Water-saving irrigation technologies of crops, drip irrigation, agro-technical measurements».
- **Goal:** Improvement of knowledge of farmers on efficient use of irrigation water and drip irrigation, agro-technical measurements.
- **Participants:** Local government specialists, farmers, WUA members and specialists, interested people of pilot WUA
- **Trainers:** TAIC PF local advisors.
- **Place of conduction:** Pilot WUA.
- **Duration:** 8 hours
- **Date and time:** from 9.30 a.m. to 5.30 p.m.

Time	Kind of activity	Method	Responsible
9.30-10.00	Registration of participants		Local specialist
10.00-10.10	Opening. Introduction. Goal of project, training program		Moderator, WUA and project representatives
10.10-12.00	Agro-technical measures of various crops (plowing, sowing, selection of varieties, pest and insects control, fertilization, harvesting, etc.)	Presentation, discussion.	Trainer
12.00-12.20	Coffee-break		
12.20-12.30	Main problems in distribution and use of irrigation water in WUA and farms	Interactive method, every participant tells his opinion	Participants
12.30-13.20	Irrigation, irrigation methods. Water-saving irrigation methods of crops: - Furrow irrigation; Short furrow irrigation; Metered water supply to furrow; Impulse irrigation; Contour irrigation and so on.	Presentation, discussion.	Trainer
13.20-13.30	Showing a video on water-saving irrigation technology	Showing a video	Trainer
13.30-14.30	Lunch		
14.30-15.20	Drip irrigation, its effectiveness, conditions of using DIS. For what types of crops drip irrigation is used, cost of the system?	Presentation, discussion.	Trainer, participants
15.20-15.30	Showing a video on drip irrigation	Showing a video	Trainer
15.30-15.50	Coffee – break		
15.50-17.00	Irrigation water metering methods: - Water gauge Chipoletti; - Water gauge Thomson; - Surface-float method.	Presentation, discussion.	Trainer
17.00-17.20	Discussion of participants	Questions and answers, discussion	Participants
17.20-17.30	Summing-up, closing		Trainer, WUA representative

Field day program
of pilot WUA on NWM project:

“Establishment and exploitation of demonstration plots and provision of trainings”

- **Name:** «Water-saving irrigation technologies of crops, drip irrigation, agro-technical measurements, water metering methods and soil moisture determination».
- **Goal:** Improvement of farmers' knowledge on efficient use of irrigation water, maintenance of water metering, use of water-saving irrigation technologies and drip irrigation, soil moisture determination.
- **Participants:** LG specialists, farmers, WUA members and specialists, interested people of pilot WUA
- **Trainers:** TAIC PF local advisors.
- **Place of conduction:** Demonstration plot of pilot WUA.
- **Duration:** 3 hours
- **Date and time:** from 9.30 a.m. to 1.30 p.m.

Time	Activity	Responsible
9.30-10.00	Registration of participants	Local specialist
10.00-10.10	Opening Greeting Goal of project and field day program	Moderator, LG, WUA and project representative
10.10-10.40	Demonstration on field: - Water-saving irrigation methods of crops: - Furrow irrigation; - Metered water supply to furrow	Advisor, demo farmer
10.40-11.10	Irrigation water metering methods: - Water gauge Chipoletti; - Water gauge Thomson	Advisor, demo farmer
11.10-11.40	Drip irrigation and its efficiency	Advisor, demo farmer
11.40-12.00	Demonstration of principle of moisture tester work to determine soil moisture	Advisor, demo farmer
12.00-12.30	Discussion questions and answers. Summing-up, closing	Advisor, project representative
12.30-13.30	Lunch	

Booklets and banners for distribution

Рис. 1. Схемы капельного орошения

Рис. 2. Регулируемая капельница

Рис. 3. Микротрубка

Для получения более подробной информации, пожалуйста, свяжитесь:

Департамент
Водного Хозяйства и Мелиорации
Жаалбай Кутубай
Координатор по институциональному развитию АНП проекта

Мариамнамыс Талант
Специалист по управлению водными ресурсами
по уровню воды

Кыргызстан, г. Бишкек,
с/д. Таштаналыева, 4а, каб. 321,
тел.: (0 312) 61 47 52
e-mail: kktpr@scit.kg

Общественный фонд
"Центр Обучения, Консультации и Инновации"

Павел Иван Жуков
Координатор по организации
инноваций пил. проекта

Кыргызстан, г. Бишкек, ул. Гражданская 43/1,
телефон: (0 312) 34 55 67
моб.: (9 555) 324466; (9 770) 21 7836
web-сайт: www.taic.kg; e-mail: taic@taic.kg;
pavel@taic.kg

Проект
"Управление национальными
водными ресурсами фаза 1"

**Капельное орошение —
экономия воды и
повышение урожая**

Бишкек-2016

КАПЕЛЬНОЕ ОРОШЕНИЕ — это способ увлажнения почвы в корнеобитаемый слой растений путем непрерывной порционной (капельной) подачи воды специальной капельницей. Система (СКО) состоит из резервуара (бак), фильтра, краника, магистрального, распределительного и поливного трубопровода и капельницы (рис. 1). Оросительная вода с помощью специальных капельниц или микротрубок без потерь подается к каждому растению (рис. 2).

Систему капельного орошения можно использовать в следующих условиях:

- в районах дефицита оросительной воды;
- на склоновых, не ровных и предгорных землях;
- на высоко водопроницаемых почвах (каменные, песчаные, гравелистые и т.д.);
- в тех землях, где другие способы орошения не приемлемы и неэффективны.

Систему капельного орошения можно применять для абрикоса, яблони, персика, черешни, винограда, томата, перца, огурца, клубники, арбуза, дыни и

других высокодоходных сельскохозяйственных культур, а также в теплицах для овощей.

Преимущества капельного орошения:

- по сравнению с поливом по бороздам экономия воды повышается в 4-10 раз;
- урожайность культур по сравнению с поливом по бороздам повышается в 1,5-2 раза;
- ускорение созревания культур;
- не допускается смыв плодородного слоя почвы, засоление и заболачивание почвы;
- с маленьким расходом воды можно поливать большие площади;
- не требуется планировка земель, требующие большие затраты;
- возможность внесения удобрений вместе с оросительной водой.

Недостатки капельного орошения:

- высокая стоимость системы по сравнению с другими способами полива;
- для системы требуется чистая оросительная вода, так как отверстие капельницы или микротрубок имеет маленький размер, и они могут засоряться.

Мнение фермера по использованию систем.

Фермер П. Максимова живет в с. Жапы Жер, Баткенского района.

Он имеет 1 га молодого сада абрикоса. Вода идет из канала Р-4, почва песчано-каменная, при поливе вода быстро уходит в глубину почвы, поэтому необходимо производить полив почвы через день. В разгар вегетационного периода из-за недостатка оросительной воды фермерам иногда приходится поливать ночью. В результате чего происходит смыв почвы, вода неравномерно распределяется по каждому бороздам (ночь, ничего не видно).

В 2013 году он приобрел систему капельного орошения. По его словам, капельное орошение имеет ряд преимуществ:

- **Экономия воды.** Для полива 1 сада уходила около 700-800 м³ воды, а сейчас 2-3 м³;
- **Экономия времени.** Раньше на полив 1 га сада уходило почти 10-12 часов, поливал ночами, а сейчас всего 2-3 часа;
- На участках между растениями не растут сорные растения;
- С соседними фермерами конфликты не происходят, воды достаточно для него;
- Не происходит смыв почвы;
- Культура имеет доступ к воде в любое время, в любом объеме.

- Фермеры получают воду по норме потребностям растений;
- Культура не пострадает от переноса и недополнка;
- Уменьшились конфликты между фермерами и мурабами;
- В АВП ведется учет воды;
- Мурабы АВП с помощью переносных водосливов измеряют расход воды каждого водопользователя.



Рис.1. Водослив Чиполетти

Для получения более подробной информации, пожалуйста, свяжитесь:

Департамент
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Проект
"Управление национальными
водными ресурсами фата 1"

МЕТОДЫ УЧЕТА ОРОСИТЕЛЬНОЙ ВОДЫ НА ПОЛЯХ



Бишкек-2016

При поливе сельскохозяйственных культур необходимо вести учет оросительной воды. Для учета оросительной воды используются следующие водомерные устройства:

- Водослив Томпсона;
- Водослив Чиполетти.

Водослив Томпсона (ВТ) применяется для определения небольших расходов воды в пределах от 1 до 30 л/с (рис. на обложке). Водослив можно изготовить из металлической или деревянной пластины. Срез должен быть точно под углом 90°. Для определения напора воды перед водосливом с правой стороны водослива устанавливается мерная линейка. Порог водослива должен быть расположен выше, чем уровень воды в нижней части водослива. Время от времени осадочные породы надо удалять, которые накапливаются за водосливом.

Как определить расход воды через водослив Томпсона?

После установки водослива в борозды или арыки определить уровень воды в мерной линейке. Затем с помощью **таблицы 1** определить расход воды, протекающей через водослив, в зависимости от напора воды перед водосливом.

Где "Н"-уровень воды перед водосливом, "Q"-расход воды.

Например, уровень воды перед водосливом Н=10см, тогда расход воды будет равным Q=4,4 л/с.

Таблица 1. Расчет расхода воды через водослив Томпсона

Н, см	3	5	8	9	10	13	15
Q, л/с	0,2	0,8	2,5	3,4	4,4	8,5	12

Водослив Чиполетти (ВЧ) используется для определения расхода воды в каналах и арыках в пределах от 5 до 300 л/с (рис. 1). Он имеет форму трапеции. Имеется стандартная длина порога в пределах 0,25 до 1,5 м через каждые 25 см. В АВП применяют водосливы с длиной порога 20-50 см.

Как определить расход воды через водослив Чиполетти?

Расход воды, протекающей через водослив Чиполетти определяется аналогично как водослив Томпсона. Для определения напора воды перед водосливом с правой стороны водослива устанавливается мерная линейка. После установки водослива в канал или арык определить уровень воды в мерной линейке.

После установки водослива в канал или арык определить уровень воды в мерной линейке. Затем с помощью **таблицы 2** определить расход воды, в зависимости от напора воды над водосливом и ширины водослива.

Таблица 2. Расчет расхода воды через водослив Чиполетти (при ширине порога 30 см)

Н, см	5	10	15	18	20	25	30	40	50
Q, л/с	6	17	32	42	50	70	92	141	197

Например, уровень воды перед водосливом равен 20 см, тогда расход воды равен 50 л/с.

Мнение директора АВП по использованию метода учета воды.

Директор АВП "Ак-Суу-Карабак" А. Турлубеков рассказывает: В 2013 году в рамках проекта ПРООН "Каждая капля имеет значение" на поле с. Кара-Бак организован демонстрационный метод учета воды, в начале участка устанавливается стационарный водослив Чиполетти. Раньше учет воды не производился и происходили конфликты между фермерами и мурабами АВП. После установки водоизмерительных сооружений в АВП произошли следующие изменения:

- Каждый фермер знает, сколько воды получает, и оплачивает полученный объем воды;



Рис.1. Полив через вторую борозду



Рис.2. Полив риса по бороздам

Для получения более подробной информации, пожалуйста, свяжитесь:

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Телефон: **CREATIVE** Проект 100 лет



Проект
"Управление национальными
водными ресурсами фаза I"

Водосберегающие методы полива сельскохозяйственных культур



Бишкек-2016

Водосберегающие методы полива

С использованием водосберегающих методов полива, фермеры на своем поле эффективно и экономно используют оросительную воду, на поле вода распределяется равномерно, соблюдается норма орошения, сохраняется плодородие почвы и повышается урожайность.

В данное время существуют следующие водосберегающие методы полива как:

- Полив по коротким бороздам;
- Полив через борозду;
- Полив риса по бороздам;

1. Полив по коротким бороздам

Для выполнения данной технологии на поливаемом участке нарезаются оптимальные короткие борозды (фото на обложке). Длина борозды зависит от водопроницаемости почвы и уклона данной местности.

Преимущества метода "короткие борозды":

- полив осуществляется быстро и качественно;
- по длине поливной борозды достигается равномерное увлажнение почвы и равномерный рост растений;
- значительно экономится время полива и оросительная вода.

Данная технология полива требует небольших физических затрат и времени, также увлажнение почвы по длине борозды будет равномерным.

Данную технологию можно применять на всех почвах и культурах. На песчаных и каменистых почвах данная технология дает хороший эффект.

2. Полив через вторую борозду

Перед поливом на поле нарезаются обычные поливные борозды. Во время полива вода подается в каждую вторую борозду, а первая борозда остается сухой, т.е. в 1-ом поливе вода подается в бороздах 1-3-5-7, а 2-ом поливе по бороздам 2-4-6-8 (рис. 1). Данный метод очень легок в применении.

Преимущества данного метода:

- экономится оросительная вода от 20 до 30 %;
- экономия затраты поливального;
- затрудняется развитие сорняков;
- можно провести прополки и другие ручные работы во время полива;
- можно поливать практически все культуры, кроме зерновых и многолетних трав.

Данный метод нельзя применять на высокопроницаемых почвах (песчаные, каменистые, щебенчатые и др.), крутых и склоновых землях.

При необходимости уменьшить ширину междурядья.

3. Полив риса по бороздам

При посеве риса применяется обычная технология посева пшеницы. Посев производится вручную или с помощью сеялки (рис. 2). Норма высева риса 120-150 кг/га. Ширина междурядья в пределах 60-70 см и зависит от водопроницаемости почвы. Полив осуществляется по бороздам. Количество поливов 15-20 раз за вегетационный период, в зависимости от климатических условий.

Преимущества метода "Полив риса по бороздам":

- Экономия оросительной воды в 2-3 раза;
- Не разрушается структура почвы;
- Не происходит заболачивание земли;
- Нет необходимости в специальной планировке борозд;
- Возможность уборки урожая обычным комбайном.

Требование к применению данного метода:

- Постоянное наблюдение за влажностью почвы перед поливом;
- Требуется специальный сорт;
- Межполивный период полива не должен превышать 4-6 дней.






КАПЕЛЬНОЕ ОРОШЕНИЕ – современная водосберегающая технология полива

При капельном орошении оросительная вода с помощью полиэтиленовых трубопроводов и капельниц без потерь подается к корневой зоне растений.

Основными элементами системы капельного орошения являются: бак-резервуар, кран для открытия или закрытия воды, фильтр тонкой очистки воды, магистральный трубопровод, распределительная труба, поливные трубопроводы, капельницы.

ГДЕ И ДЛЯ КАКИХ КУЛЬТУР ИСПОЛЬЗУЕТСЯ ТЕХНОЛОГИЯ?

- в районах дефицита оросительной воды;
- на склоновых, не ровных и продольных землях;
- где вода для полива подается с помощью насоса;
- на высоко водопроницаемых почвах (каменистые, песчаные, гравийные и т.д.);
- в теплицах для овощей.

Рекомендуемые культуры: сады, виноградники, овощи, бахчевые и другие (кроме зерновых и кормовых).

ПРЕИМУЩЕСТВА КАПЕЛЬНОГО ОРОШЕНИЯ

- Экономия оросительной воды;
- Повышение урожая;
- Ускорение созревания культур;
- Не происходит эрозия почвы;
- Возможность внесения удобрений вместе с оросительной водой;
- Сокращение конфликтов за воду в АПК;
- Уменьшение ручного труда поливальщика.

ГДЕ МОЖНО УВИДЕТЬ СИСТЕМУ КАПЕЛЬНОГО ОРОШЕНИЯ?

В 2016 году в рамках проекта ПУННР в 7 областях республики в качестве демонстрации созданы следующие системы капельного орошения:

№	Область	Район	Аймак аймак	Ф.И.О. фермера	Культура	Площадь, га
1.	Баткен	Баткен	Кара-Булак	Томасов О.	Абрикос	1
2.	Джаркент-Алтай	Ноокен	Шайдан	Жамбылов О.	Овощи	0,3
3.	Нур-Олус	Жети-Огуз	Кызыл-Суу	Кулик К.	Нёбони	1
4.	Нарын	Нарын	Жан-Булак	Мамбеталиев Т.	Овощи	0,2
5.	Ош	Кара-Суу	Токтобай	Бактуров М.	Базили	0,2
6.	Талас	Талас	Берлинге Багдар	Мундузберг У.	Овощи	0,2
7.	Чуй	Москва	Чипале	Джамбылов О.	Овощи	0,2

СКОЛЬКО СТОИТ СИСТЕМА КАПЕЛЬНОГО ОРОШЕНИЯ?

Цена на систему зависит от конкретного рельефа местности, вида, возраста и схемы посадки культур.

Примерные цены на систему капельного орошения

№	Культура	Схема посадки, м/м	Площадь, га	Средняя цена, тыс. тенге
1.	Подсолнух	5x5, 6x5, 8x6	1	40-70
2.	Овощи, фасоль, клубника и др.	0,6x0,4 0,6x0,3 0,6x0,2	1	80-100 10-15 4-6



Материалы подготовлены и выпущены при финансовой поддержке проекта ПУННР "Выращивание овощей, бахч" 17








МЕТОДЫ ВОДОСБЕРЕЖЕНИЯ И УЧЕТА ОРОСИТЕЛЬНОЙ ВОДЫ

ИМПУЛЬСНЫЙ ПОЛИВ

При таком способе подачи воды в борозды выводится порциями, т.е. сначала вода выводится до 1/3 части длины борозды и немедленно возвращается в канал. Через 15-30 мин. вода выводится на оставшуюся часть до 2/3 части длины борозды и возвращается в канал. Через 15-20 мин. выводится оставшаяся часть воды до конца борозды и сразу возвращается в канал.

Преимущества:

- высокая эффективность и экономия воды;
- уменьшение расхода воды на 10-15%;
- уменьшение расхода воды на 10-15%;
- уменьшение расхода воды на 10-15%;

КОНТУРНОЕ ОРОШЕНИЕ

Контурное орошение может использоваться на склонах с уклонами более 25% (вдоль) для уменьшения эрозии почвы.

Водосливные контурные борозды требуют специальных приспособлений, на склонах устанавливаются водосливные чашки, что позволяет избежать эрозии почвы, а также, которые позволяют использовать воду в бороздах.

Водосливные чашки на склонах выставляют вручную и на ровных полях.

ПОЛИВ ПО КОРОТКИМ БОРОЗДАМ

Для выполнения данной технологии на поле выкапывают участки ширины борозды делится на отдельные короткие борозды. Длина борозды зависит от водопроницаемости почвы и уклона данной местности.

Преимущества метода "короткие борозды":

- уменьшение расхода воды на 10-15%;
- уменьшение расхода воды на 10-15%;
- уменьшение расхода воды на 10-15%;

ПОЛИВ РИСА ПО БОРОЗДАМ

При поливе риса применяется особый способ подачи воды. Воду выводят в борозды шириной 50-70 см и длиной от водопроницаемости почвы. Полив осуществляется по бороздам. Минимум вылива 15-20 см. Водосливные чашки устанавливаются на бороздах.

ПОЛИВ ЧЕРЕЗ ВТОРУЮ БОРОЗДУ

Перед поливом на поле выкапывают обычные поливные борозды. Во время полива вода выводится в первую борозду, а первая борозда остается сухой, т.е. при 1-ом выводе вода выводится в борозды в 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918-1919-1920-1921-1922-1923-1924-1925-1926-1927-1928-1929-1930-1931-1932-1933-1934-1935-1936-1937-1938-1939-1940-1941-1942-1943-1944-1945-1946-1947-1948-1949-1950-1951-1952-1953-1954-1955-1956-1957-1958-1959-1960-1961-1962-1963-1964-1965-1966-1967-1968-1969-1970-1971-1972-1973-1974-1975-1976-1977-1978-1979-1980-1981-1982-1983-1984-1985-1986-1987-1988-1989-1990-1991-1992-1993-1994-1995-1996-1997-1998-1999-2000-2001-2002-2003-2004-2005-2006-2007-2008-2009-2010-2011-2012-2013-2014-2015-2016-2017-2018-2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2

Program
of oblast seminars on NWM project:
**“Establishment and exploitation of demonstration
plots and provision of trainings”**

- **Name:** «Water-saving irrigation technologies of crops, drip irrigation, agro-technical measures»
- **Goal:** Improvement of seminar participants on efficient use of irrigation water, use of water-saving irrigation technologies and drip irrigation, agro-technical measures.
- **Participants:** specialists of OSD, RSD, RWM, Seed inspection and plant protection, LG, and farmers.
- **Trainers:** TAIC PF advisors.
- **Place of conduction:** Oblast administration OSD training hall.
- **Duration:** 8 hours
- **Date and time:** according to schedule, from 10.00 a.m. to 4.00 p.m.

Time	Kind of activity	Method	Responsible
9.30-10.00	Registration of participants		Local specialist
10.00-10.10	Opening. Introduction. Goal of project, training program		Moderator, WUA and project representatives
10.10-11.10	Conducted activities of NWM Project in oblast and results of work on demo fields	Presentation, discussion.	Trainer, local advisor, demo farmer
11.10-12.00	Agro-technical measures of various crops (plowing, sowing, selection of varieties, pest and insects control, fertilization, harvesting, etc.)	Presentation, discussion.	Trainer
12.00-12.20	Coffee – break		
12.20-13.20	Irrigation, irrigation methods. Water-saving irrigation methods of crops: - Furrow irrigation; Short furrow irrigation; Metered water supply to furrow; Impulse irrigation; Contour irrigation and so on	Presentation, discussion.	Trainer
13.20-13.30	Showing a video on water-saving irrigation technology	Showing a video	Trainer
13.30-14.30	Lunch		
14.30-15.10	Drip irrigation, its effectiveness, conditions of using DIS. For what types of crops drip irrigation is used, cost of the system? Irrigation water metering methods: - Water gauge Chipoletti; - Water gauge Thomson; - Surface-float method	Presentation, discussion.	Trainer, participants
15.10-15.20	Showing a video on drip irrigation	Showing a video	Trainer
15.20-15.40	Discussion of participants	Questions and answers, discussion	Participants
15.40-16.00	Summing-up, closing		Trainer, WUA representative

Program
of republican seminar on NWM project:

“Establishment and exploitation of demonstration plots and provision of trainings”

- **Name:** “Project results on demo fields, water-saving irrigation technologies of crops, drip irrigation, agro-technical measures»
- **Goal:** Sharing of results of the project, improvement of seminar participants on efficient use of irrigation water, use of water-saving irrigation technologies and drip irrigation, agro-technical measures.
- **Participants:** specialists of OSD, RSD, RWM, LG, and farmers.
- **Place of conduction:** WRD training hall.
- **Duration:** 6 hours
- **Date and time:** November 10, from 10.00 a.m. to 4.00 p.m.

Time	Kind of activity	Method	Responsible
9.30.-10.00	Registration of participants		
10.00-10.10	Opening, project goal, seminar program		Moderator, TAIC director Sh. Karasartov
10.10-10.20	Introductory speech		Deputy Minister of Agriculture and Processing Industry Kerimaliev J.K. Director General of Water Resources Department K. Tashtanaliev
10.20-10.30	About outcomes of TAIC PF work under NWM Project	Presentation	Sh.Karasartov
10.30-11.00	NWM Project results in Batken, Jalal-Abad and Osh oblasts	Presentation, discussion	TAIC advisor
11.00-11.30	NWM Project activities conducted in Naryn, Talas, Issyk-Kul and Chui oblasts.	Presentation, discussion	TAIC advisor
11.30-11.50	Coffee – break		
11.50-12.10	NWM Project positive results on demo fields	Speaking of advisors and demo farmers, discussion	Local advisors, demo farmer
12.10-12.30	Agro-technical measures of various crops (plowing, sowing, selection of varieties, pest and insects control, fertilization, harvesting, etc.)	Presentation, discussion	Trainer
12.30.-12.50	Irrigation, irrigation methods. Water-saving irrigation methods of crops.	Presentation, discussion	Trainer
12.50-13.00	Showing a video on water-saving irrigation technology	Showing a video	Trainer
13.00-14.00	Lunch		
14.00.-14.50	Drip irrigation, its effectiveness, conditions of using DIS. For what types of crops drip irrigation is used, cost of the system?	Presentation, discussion	Trainer, Participants
14.50.-15.00	Showing a video on drip irrigation	Showing a video	Trainer
15.00-15.40	Discussion of participants	Questions and answers, discussion	Participants
15.40-16.00	Summing-up, closing		Project representative

Abbreviation:

NWMP – National Water Resources Management Project

NWM - National Water Resources Management

WUA – Water Users’ Association

DP – Demonstration Plot

DIS – Drip Irrigation System

ASC – Agricultural Service Cooperative

SD – Support Department

WRBA – Water Resources Basin Authority

ADA – Agricultural Development Administration

OSD – Oblast Support Department

RSD – Rayon Support Department

RWM – Rayon Water Management

WRD - Water Resources Department

LG – Local Government