CHAPTER 3. FIELD INVESTIGATIONS OF DRAINAGE WATERS RE-USE IN PLACE OF THEIR ORIGIN

Introduction

The main source of AmuDarya and SyrDrya river water quality aggravation is return water after agricultural use, namely irrigation. Irrigated lands development and water intake increase in AmuDarya river basin, hardly reclaimed lands in agricultural rotation led to collector drainage water mineralization increase. Big share of this flow comes to the river, part of it is reused, another part is released into evaporation sinks and Aral sea. From total volume of collector drainage waters which are formed in basin (36-38km^3/year), only insignificant part of 4,1-4,6 km^3 is used inside of the system, but without proper ground of its usefulness on quality and chemical composition.

Growing water diversion for irrigation and collector-drainage outflow lead to changes and violation of natural river water-salt balance. Such actions increase the river water salinity in middle and lower reaches up to 1,4-2,0 g/l on AmuDarya and 1,2-1,6 g/l on SyrDarya.

The first step in river water quality regulation and specific water expenses decrease is wide-scale measures development on drainage water outflow reduction from source of its origin to the river.

The basic of similar measures is their reuse or rotation use for irrigation in places of its formation which is widely practiced in many countries (USA, Israel, Egypt, Algeria, Mexico, India, etc.).

There is a big experience of in-contour drainage water use (including pumped ground waters) for various agricultural crops irrigation and lands leaching in Central Asian republics.

Field and experimental investigations conducted differ on natural-economic and soil-geomorphologic conditions (that predetermine quality, quantity and chemical composition of drainage water) and on scale, methodology, cropping pattern, etc., that requires experiment results generalization. On direction 3 of IPTRID register on irrigation and drainage there is information on 12 pilot plots: 7- pilot plots located in different natural-economic conditions of the Republic of Uzbekistan; 2- in Kazakhstan; 2-Turkmenistan and 1-Kyrgyzstan. List of the pilot plots is presented in table III, 1-a .

Table III. 1-a

List of pilot projects on direction 3

Code, plot index	Plot No	Sym-bol	Plot location			Location, theme
			Province	District	Farm author	
UZBEKISTAN						
03.1.Uz.	1		Djizak	near South Golodnaya Steppe Collector	- Khamzina	Saline water use for leaching and irrigation in Djizak steppe
03.2.Uz.	2		Syrdarya	-	state farm No 16 Khamzina	Development of recommendations on saline water use for irrigation in different conditions
03.3.Uz.	3		Fergana	Besharyk	- Usmanov	Study of soil and groundwater salt regime changes under long-term drainage effluent use and sustainable yield obtaining
03.4.Uz.	4		Fergana	Altyaryk	collective farm "Atakulov" Usmanov	Surface water expenses reduction at on-farm level and drainage outflow volume disposed outside farms at expense of groundwater use through its level regulation (sub-irrigation)
03.5.Uz.	5		Fergana	Buvaida	collective farm XX Partsiezd Yakubov	Study of saline drainage water use efficiency in places of its origin
03.6.Uz.	6		Syrdarya	Shuruzyak collector	- Ruziev	Set of measures on prevention of surface water pollution by toxic chemical withdrawn by drainage from irrigated fields of Shuruzyak massif of Golodnaya steppe
03.7.Uz.	7		Syrdarya	Ilich	collective farm Pravda	Saline collector-drainage water use for irrigation of agricultural crops on desert soils

Code, plot index	Plot No	Sym-bol	Plot location			Location, theme
			Province	District	Farm author	
					Nikolaenko	of southern part of Kyzylkum (Golodnaya steppe)
KAZAKHSTAN						
03.1.Kaz.	1		Chymkent	Turkestan	state farm Ikan Vyshpolsky	Water use improvement at expense of in-system drainage water use for irrigation
03.2.Kaz.	2		Chymkent	Shardara	state farm 50 year of October Djumabekov	Study of saline drainage water re-use efficiency on rice systems of South of Kazakhstan
KYRGYZSTAN						
03.1.Kyr.	1		Chu	Sokuluk	state farm Lower Chu Karmanchuk	To develop irrigation by saline drainage effluent and study its influence on soil productivity
TURKMENISTAN						
03.1.Tur.	1		Ashgabat	-	7 km from Ashgabat city	To develop technology of saline water use for agricultural crops irrigation
03.2.Tur.	2		Chardjou	Chardjou	c/f Leningrad	Cotton irrigation by magneto-activated water