



<b>F Funding agencies</b>		
	Full name or acronym	Percentage of project finance provided
1	Ministry for Land Reclamation and Water Management	100 %
2		%
3		%

**G Summary of research project (see instruction on page 1)**

**1 Objective and technical fields:**

Development of secondary salinized lands by summer capital leaching on background of rice cultivation; drainability increase by additional construction of provisional drainage adding it to permanent one.

Soil water-salt balance formation determination permanent close and temporary open drainage productivity, flooded lands influence.

**2 Scientific and technical approach:**

Prevention of soil salinization, irrigation water productivity increase,  
Meaning: scientific ground of measures on soil and water productivity increase,

**3 Environment characteristics:**

Climate is continental. Average annual temperature is 14 - 15 °C, maximum is 42 - 47 °C in July and minimum is 14 - 24 °C in January - February. Growing season duration is 200 - 230 days. Sum of active temperatures is 4 - 5 th °C. Precipitation is 260 - 320 mm, 70 - 80 % of is occurs in winter - spring time. Relative air temperature is 70 - 80 % in winter and 25 - 30 % in summer. Total evaporativity is 1000 - 1200 mm. Wind velocity is 5 - 10 m/sec of north - west direction.

Lands were taken out of rotation due to intensive secondary soil salinization,  
Relief is plain, glided.

Lithology: loess loam with permeability coefficient 0,15 - 0,25 m/day on depth of 0, - 1,2 m; volumetric mass is 1.35 - 1,5 g/cu. cm; specific mass is 2,7 - 2,84 g/cu. cm. The least moisture capacity is 36 - 39 %; water specific yields is 0,08.

Soils: grey-medow, salinized by spots - salt content varied within 0,87 - 2,0 (1968) and 2,2 - 3,8 % (1967). Salinization type mainly is chloride-sulphate.

Groundwater level was 1,6 - 2,8 m. Water salinity was 24 - 42 g/l, chemical composition: chloride-sulphate and sulphate - chloride.

**4 Parameters of Pilot Projects and Technical Solutions:**

Field observation on groundwater dynamics, its salinity, soil salt content, water- salt balance elements of unsaturated zone. Rice field irrigation regime study and soil desalinization rate under different values of infiltration.

Pilot sites were equipped by all necessary measuring devices. Systems analysis for results interpretation was used.

**5 Methodology:**

Pilot sites area was as follow: in 19966 - 25 ha, in 1967 - 5 ha, in 1968 - 29 ha.

Irrigation network - concrete flumes with discharge 0,8 - 1,2 cu. m/sec and efficiency 0,95 - 0,98.

Earthen watering ditches efficiency was 0,8 - 0,85. Drainage network; open collectors, close drains with depth of 2,2 - 3,8 m and distance between drain 170 m (1966), 300 - 310 m (1967)

and 260 m (1968); temporary drains' depth was 0,6 -1,0 m with distance between them 25 - 28 m (1966), 35 - 40 m (1967) and 30 - 35 m (1968).

#### 6 Results:

Leaching was executed within summer period through rice planting under uninterupt water supply to support its stable level over the field.

In 1966 (24,04 - 20,09) 29,2 th. cu. m/ha water, in 1967 (25.05 - 25.09) 46.8 th. cu. m/ha, in 1968 (28,05 - 01,10) 38,5 th. cu. m/ha water was supplied. Water supply was executed along the chain from one field to another; field size was from 25 x 25 m to 40 x 30 m.

Study of summer leaching of salinized lands through rice planting on background of systematic close horizontal drainage together with temporary open drainage showed:

- in 1966 by close and open drainage 5750 and 9250 cu. m/ha water was removed respectively; which is 51,5 % of water supply;
- in 1967 by close and open drainage 6500 and 5200 cu. m/ha water was removed respectively which is 25 %;

- in 1968 by close and open drainage 3300 and 6400 cu. m/ha water was removed which is 25,1 %. Maximum drainage modulus of close drainage was 0,76 (1967) and open one 9,72 (1966) l/sec/ha. Its average means were during the leaching - 0,38 and 0,55 (1966), 0,28 - 0,64 and 0,18 - 0,4 (1967) and 0,21 and 0,37 (1968).

- drainage outflow along the temporary drains is formed between the close drains.

- active zone of water and salt exchange is 16 m groundwater salinity sampled from different depth (7, 10, 12, 16, m) decreased from 28 - 45 to 20 - 26 g/l, but near close drains increased from 30 - 42 to 45 - 53 g/l (1967), from 18 - 24 to 74 - 208 g/l (1967) from 15 - 29 to 23 - 25 g/l (1968);

- drainage effluent salinity decreased in 1966 on close drains from 22 to 5,7 g/l, on temporary drains from 28.0 to 4.1 g/l. In 1967 respectively 42 - 17,55 and 23 g/l; in 1968 - 24,2 and 19; 9,4 and 7,1 g/l. Salt removal by drainage outflow: in 1966 104,9 and 97,3 t/ha respectively by close and open drainage; in 1967 - 120 - 253 and 74 - 200 t/ha; in 1968 - 54, 1 and 85,5 t/ha;

- absence of influence of drainage outflow on adjacent territories, where groundwater level was within allowed limits: 2,4 - 2, 8 m.

- favourable reclamation state of lands support in coming years.

Within 4 - 6 years chlorine-ion content within 3 m - layer was 0,024 (1966), 0,03 (1967), 0,029 (1968). Groundwater and drainage effluent salinity significant increase was not observed.

The main result of investigations is development of 1,8 th. ha of strongly salinized lands. Expenses for development are compensated by rice production, which yield was 4,0 - 5,3 t/ha.

Cotton yield on desalinized lands was 2,4 - 2,8 t/ha.

It was 14 - 22 th. ha cu. m against outflow in the point of refraction of groundwater depletion curve (0,5 - 0,8 t. cu. m);

- intensive soil desalinization; chlorine - ion content within 2 m - thickness decreased from 0,12 to 0,015 (1966), from 0,39 to 0,04 (1967) and from 0,06 to 0,023 (1968);

- soil regular desalinization is achieved within 1,0 - 1,5 m -layer due to intensive work of temporary drainage. Within 2 - 3 m - layer salt content increase was found on 15,6 t/ha under chlorine - ion content decreasing on 34,9 t/ha;

- soil 3 m - thickness desalinization was achieved: 317.1 (1966), 172,2 (1967), 409,2 (1968) t/ha. According to salt balance salt removal was respectively: 177,8; 298,3; 104,2 t/ha. It testifies about salt re-distribution to lower soil horizons;

- infiltration of leaching water intensity between close drains was different: maximum means were 60 - 70 th. cu m./ha on distance of 30 - 50 m from close drain axis, but in central part - 3 - 5 times lower. Within this stripe soil active desalinization occurred - amount of chlorine removal is 90 - 93 % of initial content;

- after water supply completion drainage network provides groundwater level lowering with rate of 0 - 8 cm/day;

- groundwater desalinization, groundwater salinity decreased to the end of leaching from 24 - 35 to 12 - 18 g/l (1966); from 32 - 70 to 25 - 4- g/l (1967), from 20 - 23 to 17 - 24 g/l (1968);


<b>H Suggested key-words</b>			
1	Soil salinization	4	Temporary drainage
2	Leaching rate	5	Close horizontal drainage
3	Groundwater level decrease rate	6	Soil and groundwater desalinization

<b>I Most recent publications (maximum 3)</b>			
1	Author(s): A. Ramazanov, B. Lazaridis, G. Batyrin		
	Title: Summer soil leaching on background of rice planting./Agriculture of Uzbekistan		
	Publication details: Investigations of water balance formation, groundwater regime, soil salt content under leaching are considered.		
	Year of publication: 1969	free access <input checked="" type="checkbox"/>	restricted <input type="checkbox"/> confidential <input type="checkbox"/>
2	Author(s): K. Yakubov, A. Ramazanov, B. Lazaridis, G. Baturin		
	Title: Experience of Golodnaya Steppe land leaching through rice sowing.		
	Publication details: Perennial field investigations on soil water - salt regime under leaching are considered. Groundwater and drainage effluent salinity changes and soil salinization are shown. Economic ground for rice use under leaching is given.		
	Year of publication: 1971	free access <input checked="" type="checkbox"/>	restricted <input type="checkbox"/> confidential <input type="checkbox"/>
3	Author(s):		
	Title:		
	Publication details:		
	Year of publication:	free access <input checked="" type="checkbox"/>	restricted <input type="checkbox"/> confidential <input type="checkbox"/>