CONCLUSION

Generalization and analysis of pilot researches on drainage outflow re-use in order to reduce its release into the rivers showed that:

1. In conditions of Central Asia on desert-sandy and middle loam soils drainage water re-use is rather possible with mineralization from 1,8 to 4,5 g/l, belonging on chemical composition to sulphate, sulphate-chloride or chloride-sulphate, calcium-magnesium-sodium type. Almost 90 % of CDW being formed belongs to given type. Efficiveness of drainage water in-contour use, proved by multi-year results of fields researches, carried out on rather large areas from 50 to 12000 ha, for example, in collective farm "Pravda", Tedjen district, of Turkmenistan; in the collective farm "XX Partsjezd", of Buvajdos district, of Uzbekistan; in state farm "Nizhcnechusky" Kyrgyzstan; in state farm "Icon", of Chimkent district of Kazakhstan and others.

2. Under agricultural crops irrigation with drainage water in vegetation period irrigation regime is kept by means of frequent waterings - on desert-sandy soils 10-12 gifts with small depth from 800 to 1600 m^3/ha. On lands subjected to salinization in autumn-winter period leaching irrigation is conducted with norm 3000-3500 m^3/ha or water recharge irrigation in spring period. In tests of keeping of salt regime with in permissible limits annual water supply norms comparing to fresh water are increased on 5-25 %. Relation ship between total water supply and total evaporation during the year provided leaching regime with coefficient from 1,05 to 1,25. Area optimal drainability was provided under relation of drainage outflow to supply equaled to 0,25-0,40.

3. More frequent irrigations allowed to regulate soil moisture within 0,7-0,8 of full fields capacity (70-80 % of FFC), and what is most important - to keep soil solution concentration within permissible limits, permitting to neutralize influence of toxic salts on root system of plants under irrigation with drainage water.

It was established that use of water with increased salinity in phase of plants ripening turns out the most optimal technology. In early stage of plants development non-saline water should be better to use. Such technology provides sustainable agricultural crop yield capacity, which is equal to control variant with fresh water irrigation. So, crop yields of fine-fibrous species of cotton on desert-sandy soils (Turkmenistan) under drainage water irrigation (Map.- 2,1-2,8 g/l) reached 35-44 c/ha.

On middle loam soils (Fergana, Chimkent district) on old irrigated lands cotton crop yield capacity reached 25-36 c/ha, that is not lower than control variants.

In the same time, certain decrease of crop yield capacity is noted under rice crop irrigation regime - on 10-15 % (South Kazakhstan) in comparison with control variant, where irrigation with river water was conducted.

In conditions of alkali soils of Kyrgyzstan (Chy valley)irrigation with drainage water lowered fodder crops yield capacity (maize and alfalfa) from 2 to 40 % versus control.

In general, used water productivity on different pilots per unit of agricultural production fluctuates from 0,210 to 0,475 kg/m^3. Last figure is at FAO level for cotton, that confirms sufficient effectiveness of drainage - released water use in formation places.

4. Under drainage water use for irrigation exchanging reactions in absorbing complex of soil occure i.e. physical-chemical reactions. Test results prove that in conditions of Central Asia, as usual, soils and drainage water are gypsum bearing (carbonate and calcium salts) that allows to escape dangers of soils sodification under drainage water use. On plots absorbed

calcium content reach 50-90 %, and sodium 2-10 % of sum and this correlation of soils does not change under multi-year use drainage water.

5. Drainage flow reuse in its place of origin allowed to reduce removal of pesticides (ammonia, nitrates, phosphorus, potassium) that will play positive role in river systems ecological state improvement .

6. Ruther effective technology of CDW treatment from pesticides and other pollutants, based on hydro-botanic methods with use of different micro-aquatic plants and microorganisms. So, results of SANIIRI tests on water treatment in collectors Shuryzyak, Sardob and others in SyrDarya district, showed possibility of accelerated water treatment from biogenic elements (ammonia, nitrates and others) and water mineralization lowering under introduction of biological treatment. Drainage water quality improvement allows to use them as for fish-production, so for agricultural crops irrigation and moreover promotes improvement of river and water reservoirs ecological state. Many pollutants content is reduced to level of permissible concentrations and lower.

7. While solving issue of drainage water regions-use for irrigation formed water quality in specific conditions should be taken into account. For different zones, having specific soil-meliorative and hydrogeological-geomorphological conditions, and typical composition of ions and salts in CDW (availability of harmful salts of nitrates, chlorides, heavy metals and others) appropriate classification should be applied to estimate this water acceptability for irrigation or leaching. In conditions of Central Asia, where as usual soda salinization of soil and CDW is absent, for CDW acceptability for irrigation 5-point scale can be used, which is worked out by academician I.S. Rabochev and generalizes recommendations of foreign, as well as local scientists.

In given scale indicators of sodium-absorption ratio (SAR-USA), sum of salts and share of toxic salts are combined.

Selections of soil types the most acceptable for CDW use is one of the important factors under estimating drainage water acceptability. Foreign and local experts by experiments determined that on soils with light structure and sandy loam saline water can be used for irrigation without danger of salinization.

Measure on CDW use for irrigation should come out from availability of drainage water volume with acceptable quality in each region.

8**.** Total volume of return waters, being formed over the Aral sea basin during the years of medium humidity is 36 38 km^3 per year, 32-35 km^3 of which corresponds to CDW, and 3,3 km^3 industrial and municipal wastes. Of CDW total volume about 51 % (16-18 km3) returns to rivers, about 36 %, i.e. 11,5-12,6 km^3 are disposed to natural sinks and lost for evaporation. Only 13 % of CDW (4,1-4,6 km^3/year) is regions-used for irrigation over all basin.

Prevailing place on the volume of CDW disposed is taken by Uzbekistan, where about 25-28 km3/year of CDW is formed. Of this volume just directly in places oforigin only 1,4-2,1 km^3 of CDW is used depending on water availability.

Carried out estimation of CDW quality according to proposed classification showed that only over Uzbekistan favorable for irrigation CDW (salinity is lower than 2,0 g/l, sodium absorption coefficient < 10 and less) are about 30 %, or 8,4 km^3 per year.

Option of soil types, the most fitting for CDW use, is one of the important factors while evaluating of drainage water relevance for irrigation. Foreign and local specialists

determined that on light and sandy loam soils there is a possibility of saliny water use for irrigation without danger of salinization.

Measures on CDW use for irrigation should depend on availability of areas and soil types with light structure in each region in connection with volumes of available drainage water with proper quality.

Evaluation of areas with light structure carried out on base of soil survey (Sredazgydrovodkhlopok and Uzgyprozem institutes) shows, that there is at least 1,5 mln ha of lands in the region, acceptable for CDW use for irrigation (over irrigated zone).

So in Aral sea basin there are about 10 km^3, acceptable for CDW in-contour use(about 30 % of total volume), which under recommendations on technology of their application can be used directly in its places of origin.