

LAND DEGRADATION IN KYRGYZSTAN

Combating land salinization in Kyrgyzstan
Desertification and Drought Day 2020

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Typical salt affected soils (Solonchaks)

- **Solonchaks** are the soil in which a large amount of salts (mainly sodium salts such as sodium chloride and sodium

Typical salt affected soils (Solonets)

- **Solonets** have been known to possess low salt concentrations

Stop the degradation of Kyrgyz lands!

The Quality of Land Resources of Kyrgyzstan, %

- The total area of land prone to erosion is 6435 thousand ha. Of these, arable lands - 770 thousand ha, pastures - 4546.7 thousand ha, hayfields - about 87 thousand ha. Water erosion, which also leads to pollution of water sources, covered 54 thousand hectares of arable land. Soil salinization caused by irregular and irrational irrigation has removed 80 thousand hectares of agricultural land from circulation.
- According to the land cadaster, a total area of varying degrees of saline

Land reclamation of degraded stony, saline irrigated lands of Issyk-Kul, Chui and Naryn regions



- There are 570 thousand ha including 280 thousand ha degraded in the balance of irrigated agriculture in Issyk-Kul, Chui and Naryn oblasts for 2013-2016.
- In the balance of irrigated agriculture of the republic in recent decades, the areas of stony, marshy and saline lands have been increasing. Especially in Issyk-Kul, Naryn and Chui regions, the area of degraded lands has reached 280 thousand hectares.

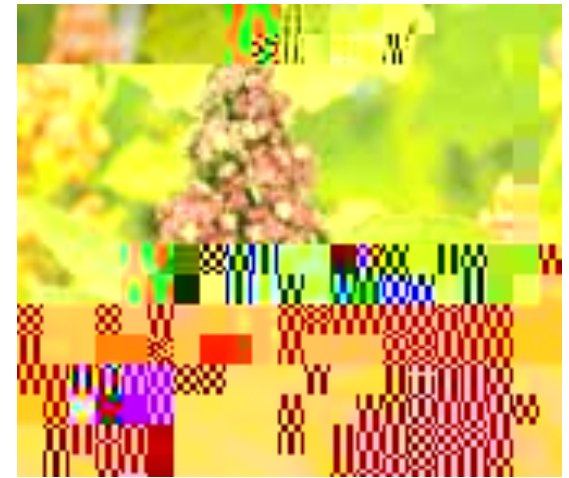
- **The degradation occurred as a result of insufficient funding for land reclamation systems. As a result, reclamation systems are degraded by 40-60 percent. According to this, a decline in crop yields by 40-50 percent. In this regard, there was a need to develop alternative farming, irrigation and drainage, social and economic measures to improve the degraded land.**
- **The diversity and complexity of natural irrigation and drainage and climatic conditions in Kyrgyzstan formed a complex of saline and solonetzic, stony, boggy soils and eroded lands both in the agricultural zone and on pastures, within the absolute heights of 400-4000 m above sea level.**
- **The area of saline and solonetzic soils in Kyrgyzstan is 3,787.5 thousand ha, including in the agricultural zone, 773.8 thousand ha and in the pasture zone, 3006.3 thousand ha.**

- Land reclamation of irrigated stony lands of the Issyk-Kul region, gray-brown desert rocky soils are common in the western part of Issyk-Kul Lake and the eastern part of Kochkor district (100 thousand ha)
- In the Chui region, against the background of a degraded collector-drainage network (CDN), there are more than 110 thousand ha of wetlands.
- For instance. In Naryn oblast there are 2150.6 thousand ha of automorphic saline lands. In the Kulanak valley without CDN, 762 thousand ha of saline and 192.4 thousand ha of solonetzic lands are used.

Salt Tolerant Crops

The saline lands in the world are so large that scientists from various countries are conducting large-scale work on the cultivation of varieties of vegetable crops with genetically determined increased salt tolerance. Selection is carried out in three directions of the formation mechanisms: (1) - salt tolerance (changing the composition of cellular protoplasm makes it resistant to high salt concentrations); (2) - the ability to release salts outward, on the surface of the leaves, from where it is blown away by the wind or washed off by rains; (3) - breeding varieties with a special structure of roots, the surface of which is poorly permeable to salts.

Salt Tolerant Crops, example



Industrial plantation of Quinoa in flowering and fruit maturation stages on salt affected and poor nutrient soil (Issyk-Kul, Kyrgyzstan)

- **Quinoa** is an annual cash crop from Amaranthaceae family. Biological Methods. This plant species is one of the oldest crops cultivated in the Andes (Latin America) about 5,000 years. As compared to common cereals Quinoa grains are very nutritious. Quinoa is known to be gluten-free, high in protein and one of the few plant foods that contain sufficient amounts of all nine essential amino acids. It is also high in fiber, magnesium, B vitamins, iron, potassium, calcium, phosphorus, vitamin E and various beneficial antioxidants. Quinoa is one of the world's most popular health foods. Its seeds may be consumed as human food in flour, baked products, soups, drinks, salads and breakfast cereals. Leaves and stems are used as animal feedstock for its higher nutritive value. The United Nations declared in the year 2013 “The International Year of Quinoa” due to its high nutrient value and potential to contribute to food security worldwide. (Kristina TODERICH)

Combat salinization

- But saline soil can be fixed. Physical method. The main method of reclamation of salt marshes is flushing. To do this, you must first equip the drainage on the field, then make sure that the irrigation water itself is suitable for such washing (and,

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- Solonetztes (solonetzic soils) are formed under conditions of non-leaching water regime with the accumulation in the soil absorption complex of sodium (less often - magnesium) in amounts of 10 to 70% of the absorption capacity. The solonetz looks different than the solonchak

THANK YOU!



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DESERTEIFICATION

