

Improvement of Agricultural Technologies Agriculture and Increasing Volume of Pastures in the Conditions of Lack of Water

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Abstract--- *In recent years, the Republic of Karakalpakstan often has low water levels. According to the forecasts of international experts, this phenomenon may happen again in the future, and the level of water supply can still be reduced by 10-15%. Therefore, it will be advisable to draw up plans for the distribution of crops in accordance with the forecast of the expected degree of water availability.*

Keywords--- *Karakalpakstan, Agriculture, Oligoamnios, Agricultural Technology, The Salted Soil, A Crop, Efficiency, Profitability, The Prognosis Sufficiency of Water Supply.*

I. INTRODUCTION

Due to the extreme climate and hydrogeological conditions, the soils of the Republic of Uzbekistan are characterized by a low humus content and a high tendency to salinization. The republic itself is located at the very end of the central sprinkler of the Amu Darya River in the very north of world cotton growing. Therefore, there is a situation tension associated with the distribution of water resources. Not all plants in such soil and climatic conditions are able to grow and give a satisfactory yield.

For instance. In 2000-2001, 2008, 2013-2016. in Karakalpakstan, an extreme shortage of water was felt in the fields, which led to a sharp decrease or destruction of crop productivity. According to international experts, this phenomenon may recur in the future. Since the 1990s, Uzbekistan and Kazakhstan, from the rostrum of the United Nations and other international and regional organizations, have constantly attracted the attention of the world community to the Aral Sea problem and its close relationship with regional and global security issues.



Figure 1: Our President at the UN with the Aral Map

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The problem of water supply also raises the joint use of water resources of transboundary rivers in particular in Central Asian countries. High hydrological dependence between the countries of the region is characterized not only by a large number of participants, but also by the uneven nature of the formation, use and distribution of water resources. Central Asia is considered to be the region with one of the highest levels of water availability on a global scale, but the uneven location, inefficient use of water, the lack of modern water-saving technologies, the need to constantly increase food production and industrial products to ensure a rapidly growing population, as well as depreciation of irrigation facilities and water-saving systems, today have created a sharp water shortage, both in rural areas and desert zones, as well as in industrial centers and everywhere.

According to international experts, by 2050 the volume of river runoff in the Amu Darya river basin may decrease by another 10-15% and Syrdarya by 2-5%. The number of dry years and the number of years with a drought will increase with loss of runoff up to 25-40%, which will cause a sharp increase in water demand and a tightening of the water deficit.

Aral Sea served as a climate control pond and mitigated extreme weather fluctuations throughout the region. Air masses that invaded the region warmed up in the winter and cooled over the sea in the summer.

The Aral Sea, which belonged to Uzbekistan and Kazakhstan, ranked fourth among the lakes and therefore it was called the sea. It was fed by the waters of two large Central Asian rivers - the Amu Darya and Syr Darya.

The mark of the Aral water surface was almost 80 m above the level of the Caspian Sea. It was 428 km long and 234 km wide, with a maximum depth of 69 m and a volume of 1064 km³.



Figure 2: Pictures of the Aral Sea from Space in the Period from 1964 to 2020

The living standards and welfare of the majority of the population living on the territory in the Amu Darya River Delta are closely related to the state of irrigation water, on the volume and quality of cultural and natural pastures for livestock. Whereas earlier, rural residents mainly worked in state-owned livestock or other farms and received a salary that to some extent satisfied their needs, in recent years, due to the privatization of livestock farms, they have lost their jobs and, accordingly, a source of income, which led to a sharp increase in the number of animals kept in private farmsteads. If earlier in one yard 5-6 sheep and goats, 1-2 cows were kept, today their number has become 15-20 times more. All this led to unsystematic use, degradation of pastures and tugai forests and created a threat to the biodiversity of the territory. This is due to the lack of effective management of existing grazing areas.

II. MATERIALS AND METHODS

This work was carried out during the improvement of agricultural technologies of agricultural crops, as well as during geobotanical studies in selected areas of the Republic of Karakal-pakistan. The relevance of the topic is reflected in the conclusions and proposals made to improve the improvements and agricultural technologies of agricultural crops in the state of natural pastures of the Republic of Karakal-pakistan.

The aim of this work is to conduct a detailed study followed by an analysis of its results and develop recommendations on practical steps to improve the management of density and productivity of crops, natural areas of grazing, which will contribute to the preservation of natural and cultural pastures.

The results of many years of analysis show that, in the most watery years from 1960 to 1970. 41-42.5 km³ per year (acute for five-year periods) entered the sea, and from 1980 to 2010 excluding 2005 and 2010 the flow of water into the great sea has virtually ceased. During the last period from 1998 to 2010, 2010 was the most busy year. By analyzing the water management situation in the Syrdarya and Amu Darya river basins, it is possible to make predictive studies on the expected volumes of water inflow in the Aral Sea along the Amu Darya River.

If the demand for water is not resolved, this can cause crop loss, which, with population growth, will pose a serious risk to food security.

The results of scientific hydrogeological, soil, environmental, climatic geobotanical analyzes showed that the main reasons for the drying of the Aral Sea were;

1. Separate states located on the upper reaches of the Amu Darya and Syr Darya have built large canals in the desert and transferred water from the Amu Darya and Syr Darya to deserts and semi-deserts.
2. Until 1960, water withdrawal for all needs of the region did not exceed 63 km³; after 2000, with the inclusion of water demand in Afghanistan and Iran, it amounted to about 103.0 km³.
3. The total area of irrigated land that takes water from the Amu Darya increased from 3.2 million hectares in 1913, up to 7.6 million hectares in 2018, including Kyrgyzstan - 5% of the total amount of irrigated land.
4. From the point of view of the demographic factor, the population of the Aral Sea region began to grow sharply from 14 million (1960) to 65 million people (Uzbekistan, Turkmenistan, Tajikistan, Kyrgyzstan, Kazakhstan and some parts of Afghanistan). Excessive moistening of irrigated lands at one time led to an increase in the level of groundwater, which resulted in the discharge of highly mineralized drainage water into the Amu Darya and Syr Darya.
5. The contradiction continues between the irrigation regime of water use by the countries of the lower reaches of neighboring states such as Uzbekistan, Kazakhstan, Turkmenistan and the energy use of rivers by the countries of the upper reaches (Tajikistan, Kyrgyzstan).

According to international experts, toxic salts from the Aral region were found on the peaks of the Pamir Mountains, the coast of Antarctica, in the glaciers of Greenland, forests of Norway and many other parts of the globe. The productivity of the main pastures is reduced. The local climate in the Aral Sea is changing. As a result, due to negligence, mankind appeared Aralkum desert with an area of 5.5 million hectares.

There is a decrease and disappearance of wild, expensive and medicinal plant and animal species. Previously, the Aral Sea region was considered a region with a wide variety of flora and fauna. If in the Aral region earlier the number of saigas reached 1 million heads, the floristic composition was 638 species of higher plants, by the end of 2019, most species had disappeared. 12 species of mammals, 26 species of birds and 11 species of plants were on the verge of complete extinction.

Until the 1960s, the Aral Sea was the largest fishery reservoir in Central Asia with an annual catch of up to 40 thousand tons of fish.

The construction of the world's largest artificial canal - the Karakum and the creation of huge irrigated tracts throughout Central Asia - was declared a victory over the desert! However, 40 years later, nature avenged mankind - created a new desert - Aralkum.

Today, the mirror area of the remains of the Aral Sea is less than 10% of the 1960 level. The volume of water decreased by almost 40 times. By 2050, the volume of river flow in the Amudarya river basin will decrease by 10-15% and the Syr Darya by 2-5%. The number of dry years and the number of years with a drought will increase with loss of runoff up to 25-40%, which will cause a sharp increase in water demand and a tightening of the water deficit. Failure to meet water demand could result in crop loss, which, with demographic growth, would pose a serious risk to food security.

“Having seen the consequences of the ecological crisis in the region, UN Secretary-General Ban Ki-moon said, “I have personally witnessed the complexity of the ecological situation in the Aral Sea region. This is a serious warning to all of humanity. This global problem must be addressed jointly by all the states of the region. ”



Figure 3: UN General Secretary António Guterres

UN Antonio Guterres Karakalpakstan noted that "May the Aral Sea be a symbol of the destruction of the planet by mankind, and let it be a lesson for all of us, to mobilize the entire international community in the implementation of the Paris climate agreement so that tragedies like the one I saw in Uzbekistan did not happen again. "

This work was carried out during geobotanical studies in selected areas of the Republic of Karakalpakstan. The relevance of the topic is reflected in the conclusions and proposals made to improve the state of natural pastures of the Republic of Karakalpakstan.

The aim of this work is to conduct a detailed study followed by an analysis of its results and develop recommendations on practical steps to improve the management of density and productivity of crops, natural grazing areas, which will contribute to the preservation of natural and cultural pastures. Based on the foregoing, the task was set:

- Definition of the weak link of the elements of agricultural technologies of agricultural crops;
- To carry out a quantitative analysis of livestock (by type) within the project area and adjacent areas, as well as land areas where grazing is carried out;



Figure 4: The Authors of a New Variety N. Reimov and D. Edenbaev

- To assess the real threat of water shortages to the Food Program of the Republic of Uzbekistan;
- Assess the real threat of grazing on the tugai ecosystem;
- Reinforcement of weak links; elements of agricultural technologies of agricultural and pasture crops.
- Offer practical and proven methods for growing agricultural and pasture crops.
- Offer practical and proven reduction methods
- Pressure of cattle grazing to crops of agricultural and pasture crops;
- To propose a concrete plan of action and distribution channels to increase awareness of livestock owners and government agencies, regarding new approaches.



Figure 5: Master student O. Reimov near Long-term Sorghum Livestock; "Azamat" together with the Author of the Variety D. Edenbaev

- Develop specific activities for sustainable livestock in the Republic;
- Prepare a timetable for testing sustainable livestock production in Karakalpakstan;

III. RESEARCH RESULTS

Under the personal leadership of the President of the Republic of Uzbekistan Sh.M.Mirziyoyev starting in 2017, in the ecological disaster zone began charity work on the development and landscaping of the empty bottom of the Aral Sea. To develop the drained bottom of the Aral Sea, the Aral Sea region, forest plantations are being developed with drought-resistant tree crops (saxaul, selenium, chogon, artemia, etc.).

At present, the Aral Sea as a single water body does not exist. Instead of the need for water at 5.5-6 km³ per year and for low-water – 4.5 km³, in fact, only no more than 4 km³ per year is provided, and in low-water it drops to 1.2 km³. Highly mineralized water, salinity reaches up to 312 grams per liter.

The President of the Republic of Uzbekistan Shavkat Mirziyoyev calls on a multitude of peoples to overcome the effects of the drying up of the sea today and requires the active consolidation of international efforts. According to this, by decree of the President of the Republic of Uzbekistan dated October 16, 2018 No. PP-3975, the first one was created – the International Innovation Center of the Aral Sea region; second, an innovation support fund has been created in the Aral Sea region;



Figure 6: Initial Work on the Development and Landscaping of the Drained Bottom of the Aral Sea

Across the entire territory of the Republic of Karakalpakstan, all animal species are grazed almost on pastures and reed massifs with an area of 5,257,353 hectares, with top dressing in autumn-winter non-grazing days.

IV. CONCLUSION

Summarizing the results of the research, we can conclude that;

1. Under the conditions of the Republic of Karakalpakstan, with annual water deficits, it will be advisable to improve the agricultural technology of crops with a forecast of irrigation water, the level of fertility, as well as the mechanical quality of the soil.
2. Depending on the shortage of irrigation water, it will be necessary to re-specialize a significant part of the national economy for grazing, in order to create the optimal conditions for animal husbandry.

3. The current state of the water supply from the Amu Darya and collectors is extremely unstable and does not provide constant watering of reservoirs and wetlands in the Amu Darya delta.
4. It is advisable to establish continuous systematic monitoring with an innovative approach to water accounting (water flow in canals, reservoirs and the water level in lakes) and improving the system of hydrological forecasts of water inflow into the Amu Darya River Delta. At the same time, an information-analytical monitoring system will be created in online mode for local water bodies of the Aral Sea region.
5. An ICWC decision is required to review the priority of delta water supply, especially in dry years.
6. To provide the population with high-vitamin products during the year in the Aral Sea region, it is necessary to create energy-efficient sun-heated greenhouses for growing lemon, greens and agricultural crops near water sources to connect them to water and electricity.
7. It is necessary to train specialists with higher education and masters (geobotanists, land surveyors, soil scientists, geographers, ecologists, geologists and others).
8. Modernization of the mechanisms of hydrological regulation of the dysfunction hazard of water management systems and complexes. Develop a water management strategy in emergency and conflict situations. Introduce water-saving technologies into production, like Izrail technology and other water-saving factors.
9. Management of wetland ecosystems and coastal corridors of the Aral Basin is necessary to support sustainable livelihoods.



Figure 7: Alfalfa and Clover are very Suitable Crops for our Area

10. Effective engagement mechanisms can be, on the one hand, the interest and trust of stakeholders, and, on the other, top-down process management.
11. It is necessary to create educational trainings to increase the information content of the population on the issues of sustainable management of natural resources, create an advisory committee, involve the population in the development of plans for the optimal use of pastures, measures for livestock care during the wintering period, etc. through the creation of APP.
12. It is necessary to increase the sowing of cultural and natural pastures, medicinal plants like alfalfa, sorghum, corn, licorice, reed, etc., which are valuable for pharmaceuticals and animal husbandry.



Figure 8: Liquorice



Figure 9: Newly Formed Pasture in the Desert

REFERENCES

- [1] Disasiyer by Design: Aral Sea Suslainabilily and its lessons. Prof. Michael Edelstein, A sir id Cyerny, Abror Gadaev, UK, London 2012
- [2] UN report on the development of society “What is behind the lack of water: Power, poverty and the global crisis of water resources” M .: “The whole world” -2006.