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Integrated soil and water management under saline conditions in Ukraine

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Introduction

To ensure the sustainable development of salt-affected soils in Ukraine, the application of the principles of integrated management of soil and water resources is relevant. The basis of the concept of integrated management is the management of soil and water for socio-economic development and preservation of ecosystems.

At the same time, it is necessary to observe the regulation of reclamation loads. It is aimed at ensuring environmentally safe land use with the establishment of mandatory standards, rules and requirements for the use and protection of ameliorative soils, compliance with environmental and sanitary and hygienic safety requirements (Vargas R. at al, 2018).

The **state the objectives of the work** are regulation of reclamation loads on salt-affected soils as a component of integrated management of soil and water resources in Ukraine.

Figure 1: Salt-affected soils in Steppe zone of Ukraine

Methodology

The **objects of research** were irrigation water, salt-affected soils and crops. The research was conducted in the Steppe and Forest-steppe zone of Ukraine. The impact of irrigation with water of different quality on the state and properties of irrigated soils was studied. Evolutionary changes in the soil were evaluated for regulation of ameliorative loads on irrigation.

Figure 2: The object of research

Results and Discussion

To ensure the integrated management of water and soil resources, it is necessary to apply conceptual approaches to the regulation of reclamation loads. The result of salt-affected soils regulation is the regulation of the system "ameliorative load-soil". Degradation processes are the cause of ignoring the potential of soils, exceeding the permissible levels of anthropogenic loads, and low resource provision of the agricultural sector.

Regulation of ameliorative loads should be aimed at achieving the maximum socio-ecological effect and minimizing negative changes from anthropogenic impact on soils. The system of norm must constantly adapt to the variability of natural and anthropogenic factors in compliance with the requirements for preserving the ecological and productive functions of soils.

Soil changes over time and under the influence of irrigation as a powerful anthropogenic factor. The stepwise evolution of soils under irrigation occurs even if standardized irrigation is observed.

In Ukraine, the Resolution of the Cabinet of Ministers of Ukraine dated September 2, 2020 № 766 «On standards for environmentally safe irrigation, drainage, irrigation and drainage management» approved standards for environmentally safe irrigation and irrigation management.

Soil quality standards should regulate the degree of their salinization, alkalinization, structure density, possible loss of organic matter, provision levels of mobile forms of nutrient macroelements, degree of contamination with toxicants. We have developed the Concept of regulation of ameliorative loads on the soil cover of irrigated lands (Concept, 2020).

Norms of reclamation loads should be oriented towards solving the tasks of ensuring soil stability, restoring their fertility, preserving soil cover and land resources, minimizing the negative impact on soils, and performing ecosystem services with soil. Regulation as a component of integrated management of soil and water resources should be fixed at the legislative level.

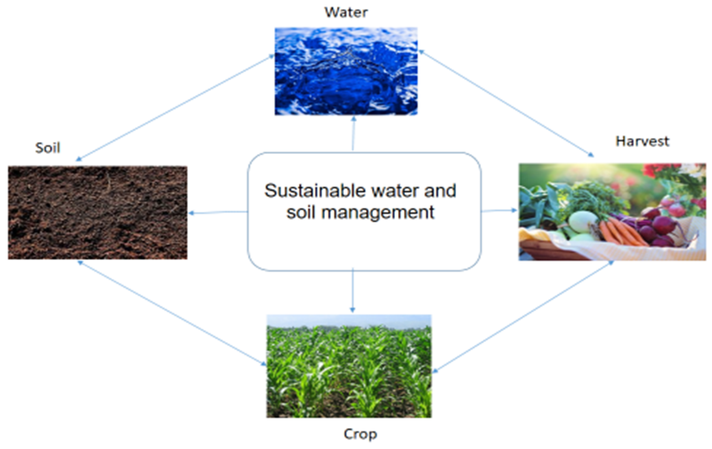

Figure 3: Component systems of sustainable integrated management of water and soil resources

Conclusions

Conceptual approaches to the regulation of ameliorative loads on the soils, in particular salt-affected soils, have been developed. They are aimed at minimizing the negative impact of reclamation loads on soils and the environment, taking into account the intensity of use of reclaimed land.

References

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Acknowledgements

I express my gratitude to the employes of the laboratory of hydrodeficient, hydromorphic and acidic.