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Doctor of Technical Sciences, Professor Muradov Shukhrat Odilovich.
Doctoral student Barnahol Begmatovna Turaeva.

ECOLOGICAL AND WATER MANAGEMENT ZONING (EWMR) OF UZBEKISTAN.

Muradov Sh.O., Turaeva B.B.

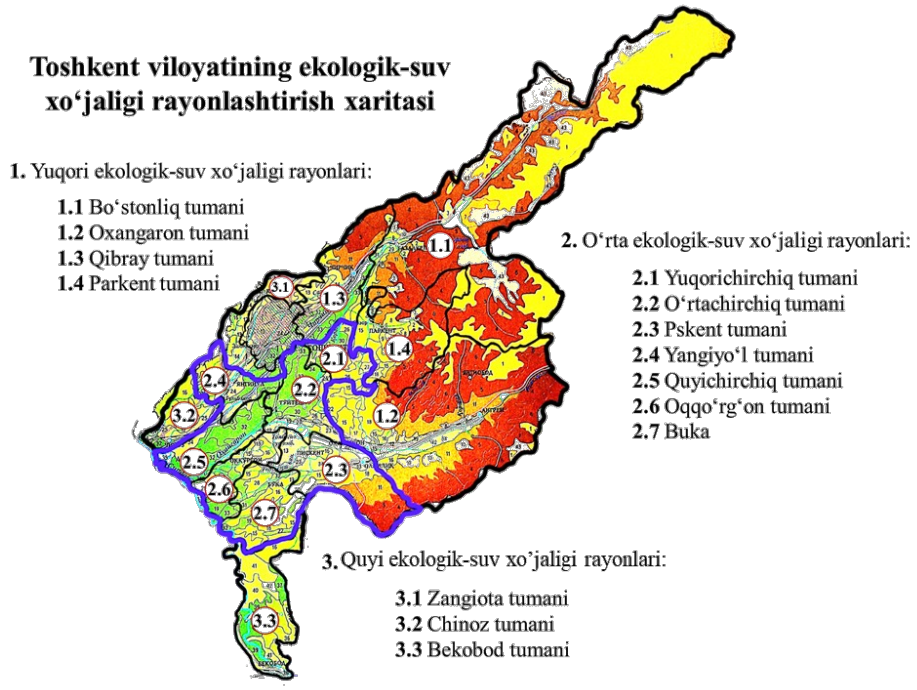
Abstract: Based on many years of research and analysis of natural conditions, ecological and water management zoning of individual regions of Uzbekistan was carried out, substantiated by the method of mathematical statistics and some recommendations were given.

Keywords: Irrigation, water and land resources, mathematical methods, zoning.

As I.V. Mikheeva notes, the global warming observed in the last decade causes aridization and the development of desertification processes in arid territories. Soil drying is one of the negative manifestations of desertification. In these conditions, the study of the soil water regime, including on the basis of mathematical modeling, becomes extremely relevant. The practice of developing irrigated agriculture in Uzbekistan shows that many issues of using water and land resources are usually resolved within the republican, regional, district and other administrative boundaries... (E.I. Chembarisov, T.Yu. Lesnik,. Confirming the correctness of this decision, Academician I.P. Svintsov states that long-term plans to combat desertification should be focused on a comprehensive solution to the problem within the administrative boundaries of a farm, district, region (republic) or landscape. This is a guarantee of mandatory implementation of environmental protection measures, a guarantee of stable nature management and conservation of

biodiversity, a guarantee of solving environmental problems and bringing the agro-industrial complex out of a crisis situation.

The need to integrate individual administrative districts is justified not only by the noted factors, which are historically divided taking into account the main natural conditions, landscape and the structure of water management works, but also by mathematical methods of analyzing water management characteristics (water intake for irrigation and drainage water flow) over a long-term period (1955-2022) using the STATISTICA program and the standard Microsoft Excel program package.



Environmental and water management zoning map of Tashkent region.

1. High environmental and water management rates:

.1 Bostanlig district.

1.2 Okhangaron district.

1.3 Kibrai district.

1.4 Parkent district.

2. medium ecological water management district:

2.1 Upper Chirchik district.

2.2 Middle Chirchik district.

2.3 Pskent district.

2.4 Yangiyol district.

2.5 Kuyichirchik district.

2.6 Akkorgon district.

2.7 Buca.

3. Lower ecological water management regions:

3.1 Zangiota District.

3.2 Chinoz district.

3.3 Bekobad district.

Map-scheme of ecological and water management zoning of Tashkent region.

For scientific substantiation of environmental and, in particular, water-sustainable technologies, as a result of our long-term research (1986-2022),

Tashkent region into 4 separate upper, 1 middle and

3 separate lower EWHRs – upper (Bostanlyksky, Akhangaransky, Kibraysky and Parkentsky districts), middle (Verkhnechirchiksky, Srednechirchiksky, Pskentsky, Yangiyulsky, Nizhnechirchiksky, Akkurgansky, Bukinsky districts), lower (Zangi-Ata, Chinazsky, Bekabadsky districts).

Conclusions:

1. The analysis of the water management situation of individual regions by the method of mathematical statistics for 42-56 year periods is quite representative, since they cover all typical hydrological years and water management activities. This made it possible to identify patterns in the main water management indicators for each EWHR.

2. The assessment of the water management situation made it possible to reveal that more efficient management of water and land characteristics is carried out with the differentiation of ecological and water management conditions.

3. Taking into account numerous zonings of Uzbekistan, a detailed analysis of ecological and meliorative, water management, meteorological and “Xalqaro ilmiy-amaliy anjuman to‘plami 2023”other natural and socio-economic features of the republic, ecological and water management zoning of individual regions was carried out.

The upper, middle (subregion) and lower EWHRs were identified. In essence, this is the first experience of zonal-regional zoning in modern terminology.

4. Ecological and water management zoning allows not only to identify water management potential, but also to clearly assess the negative ecological and meliorative consequences in a specific area and, accordingly, develop a set of effective water-sustainable measures.

5. The completed ecological and water management zoning of individual territories of Uzbekistan will allow solving ecological and meliorative problems at a qualitatively new level by rationally placing participants in the water management complex (WMC), as well as to outline technical, economic and organizational measures for the arrangement of water management organizations.

6. The main taxonomic unit of the new version of the synthesizing map of the EWHR is not a river basin, but administrative districts - physical and geographical conditions or landscape that represents a specific region with a single natural basis, geology, relief, climate, soils, biogeocenoses, hydrogeological, morphological and ecological and meliorative conditions, which is the main determining factor in the establishment of a water-stable environment of irrigated areas.

7. Based on the new fundamental methodology, maps of the scheme of ecological and water management zoning were compiled within the irrigated and meliorative

territories of individual regions of Uzbekistan, which will make it possible to analyze the main water management indicators with the aim of developing a set of technical solutions for improving ecological and meliorative conditions.

8. Zoning allows regulating the use of ecological meliorative and water-stable methods depending on natural and water management conditions. It is the basis for compiling a GIS-EWHR for a region with identified representative information areas.

9. Zoning will allow for a detailed analysis of the main ecological and meliorative characteristics such as the dynamics and mineralization of groundwater, metamorphosis of the chemical composition of water resources, and for developing a set of methods for regulating them. As well as a detailed analysis of the main factors (hydrological, hydrogeological, water management) that affect the process of environmental degradation.

For the first time, an orderly metamorphism of the chemical composition of water resources in connection with irrigation in the designated territory was investigated using a modern mathematical method of analysis, which produced a retrospective qualitative and quantitative assessment of ground waters and revealed a regularity; a method of classifying the "interval of critical depth" of bedding ground waters and implementing a regional zoning was developed; a soil desalting method was developed with the goal of preventing soda salinization and increasing the productivity of irrigated lands; the principles of generation of anti-filtering screening for specific depth of ground waters were developed;
For flat gypsiferous soils, a water-saving and soil-protective method that prevents irrigational erosion was suggested; There was a scientifically proven sub-irrigation method for the arid territories that improved the water-air and water-salt conditions of the aeration zone by increasing the biological cycle of elements. Additionally, a small power-efficient method of demineralizing collector-drainage, underground, and lake waters was developed, along with a scheme for controlling drainage flow

and the "Cascade." Furthermore, ecological carbon dioxide was used for the first time; techniques for enhancing the effectiveness of plants' use of groundwater, irrigation, and atmospheric precipitation were refined; adverse events were avoided; aeration zone productivity was increased; and energy resources (exergy) were increased. For geographers, hydro geochemists, hydrologists, ecologists, land reclamation experts, soil and water specialists, farmers, and environmentalists. The book can serve as a textbook for trainees, students, and job seekers in their respective fields.

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