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FEATURES OF INTEGRATED WATER RESOURCES MANAGEMENT OF THE CHARVAK RESERVOIR

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ABSTRACT

For the assessment of water resources for sustainable development of the country and its regions need to have comprehensive and current data on the supply of quality water, the conditions of the formation of the hydrological regime of water bodies and their environmental condition, as well as a possible change in its inventory under the influence of natural and anthropogenic factors.

KEYWORDS: *Water, rivers, Water resources, Database, industry, Agriculture.*

INTRODUCTION

Intensive economic use of small rivers and other water bodies, increasing pollution and depletion of water resources urgently requires the development and preparation of schemes of rational use and protection of water resources at the regional level, the creation of a permanent system of accounting and water resources (water cadaster) for efficient water management. The use of this development of technology for storing and processing hydrological information is a very urgent problem, as it allows us to find optimal solutions for the use of water resources. Water resources are one of the most important components of the human environment. Intensive economic use of small rivers and other water bodies, increasing pollution and depletion of their water resources urgently requires the development and drawing up of schemes.

DISCUSSION

The current stage of information technology development is characterized by the wide application of mathematical methods for modelling, analyzing and evaluating the state of natural and economic complexes. [2] Since spatial aspects play a significant role in such systems, an effective solution to the problems of assessing the state is associated with the use of geoinformation technologies that integrate data about the territory and provide tools for processing and analyzing spatial information.

Intensive development of computer technology and information technology in recent years; As it is clear from the analysis of the current state of the problem, at present, the methods of electronic cartography are widely used both in our country and abroad [1].

In recent years, in the CIS countries and directly within the borders of Uzbekistan, a system of monitoring and control, assessment and forecast of changes in the state of the geological environment - the monitoring system has been created and successfully operates. A special place in the monitoring system is occupied by the tasks of managing the geological environment, which has a different scale - from studying individual objects to planetary tasks, from assessing the state of the geological environment in a narrow time slice up to many decades; from studying and forecasting a separate natural and technical complex to regional forecasts. Such a wide range of tasks related to changes in the geological environment requires the systematization and processing of large amounts of information [5].

The main deciphering signs in the determination of area and linear geological structures and the separation of the boundary of the KDK in terms of the composition of rocks are the pattern and structure of the colour gamut (spectral brightness) of the studied territory. The structure of the picture and the spectral brightness of the object, in this case, depends on the physical-mechanical, chemical properties, mineral composition, textural and structural features of the rocks, and also on the geological structure and geographical conditions of the territory (Figure 1).

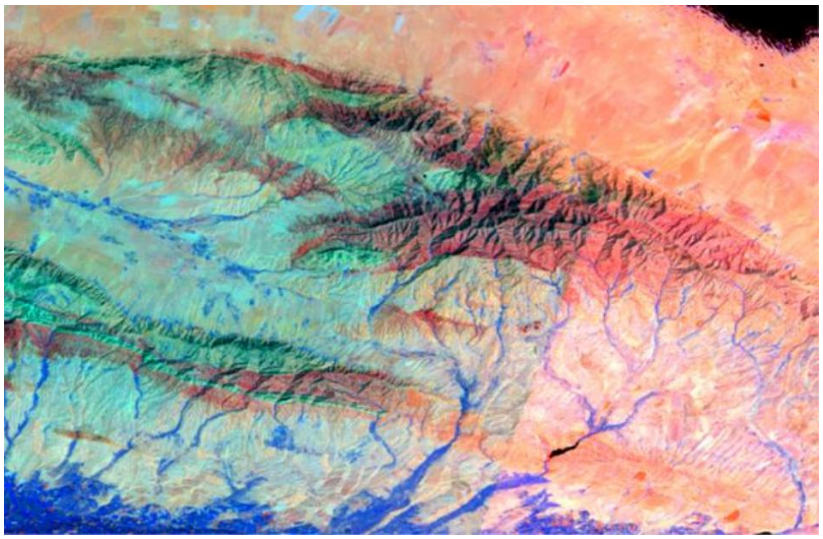

Figure1: Area and linear structures based on drawings and color anomalies on RSD materials, Western Uzbekistan

Based on the recognition of various geological structures on the materials of space surveys, the preliminary distances are compiled according to the above-mentioned signs (Figure 2).

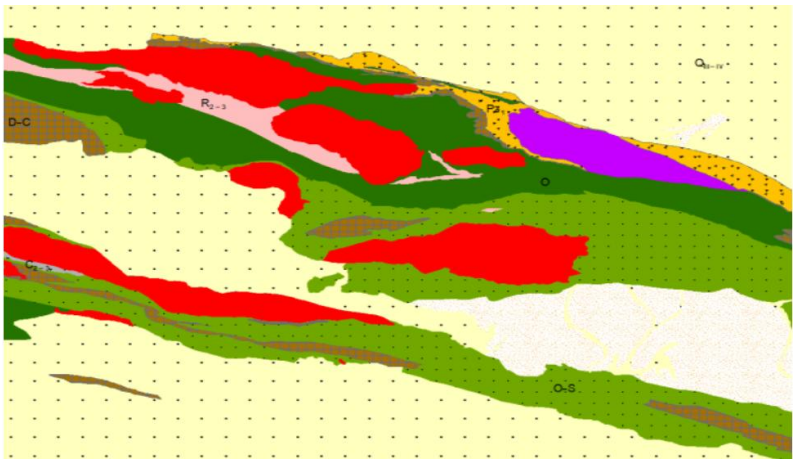

Figure 2: Results of interpretation (preliminary) RSD materials, Western Uzbekistan

The valley of the Chirchik River is the most developed in the republic. Industry and agriculture are booming here. There are more than 150 industrial, municipal and other enterprises in the Chirchik River Valley. [8] Agricultural crops are grown in almost all suitable areas of the lower terraces of the valleys. Large areas of the valleys are occupied by industrial and drinking water intakes. Their territories are partly used for growing vegetables and fruits. In the middle part of the valley is the Chirchik industrial complex, which includes the Uzbek plant of refractory and heat-resistant materials, a chemical plant. The main sources of industrial and municipal pollution, concentrated within the valley, can be divided into a point (industrial enterprises, public utilities, etc.), linear (surface watercourses) and areal (territories whose soil is polluted by industrial emissions into the atmosphere); according to the mode of operation – on a permanent basis [4].

The development of industry and agriculture depends on the availability of water resources. Despite their apparent significance in some areas, there is already a shortage of surface and underground water resources, which is due to seasonal variability in river flow, as well as uneven loads on the surface and underground water resources within settlements, agricultural and other objects, the development of irrigated agriculture, causes a significant change in the qualitative composition of surface and underground water. Their amplitude, the composition of anthropogenic-metamorphosed ingredients, as well as changes in physical properties are determined by the predominance of certain types of pollution. Due to the uneven distribution of pollution sources across the valley, the manifestation of pollution processes is uneven. The technical factor of changing the natural environment of the sections of the Chirchik River has become particularly evident since the 60s of our century. For several decades of intensive [7]. Among the technogenic factors, the main ones that affect the change in the chemical composition of natural waters are industrial and agricultural production. The chemical industry enterprises that pollute natural waters include the Chirchik Nitrogen Fertilizer Plant and the Electrochimprom. The Chirchik PO “Electrokhimprom", built according to the projects of the

pre-war period, in which the issues of wastewater treatment were not resolved. Since the beginning of the 60s, the company has built more than 45 different facilities for the treatment of harmful discharges. Water consumption by the Electrochimprom plant is 665 thousand m^3/day, water disposal-588 thousand m^3/day of these, 488 thousand m^3/day is discharged into buffer ponds, 10 thousand m^3/day into the slag storage tank, and the rest is drained into the city sewer. The waters of buffer ponds in high concentrations contain ammonium, nitrate, nitrite, petroleum products, phenols, copper and other components, some of which are systematically observed in the Chirchik River after the Yumalak reservoir flows into it. The enterprises of the metallurgical industry that pollute natural waters include the plant of refractory and heat-resistant metals with water consumption of 47.6 thousand m^3/day and water disposal of 46.3 thousand m3/day. In recent years, the plant has carried out extensive work on the construction of new treatment facilities. Before the reconstruction of runoff production done in the slum, which is a pit, the bottom of which is the roof of pebbles, devoid of any grout curtain, resulting in polluting components was freely admitted into the groundwater. The plant's effluents contain large amounts of ammonium, nitrite, nitrate, molybdenum, iron, copper, tungsten, cobalt, chromium (ammonium-181.2, molybdenum – 16.4, copper – 0.8, iron – 29.0, tungsten -1.6, chromium – 0.004, cobalt – 1.3 mg/l). In November 1980, the company “Caprolactam " was put into operation” BY “Electrokhimprom”. Its water consumption is-22,32 thousand m3/day, water disposal – 20 thousand m^3/day. Salvo discharges produced by Caprolactam, part of the production and” conditionally clean " wastewater through the storm sewer network are discharged without any treatment into the Chirchik River. They contain (mg/l): ammonium ions-15.7, nitrates-23.1, and nitrites-1.4. Industrial waste causes pollution of natural waters in certain areas of the Chirchik River Valley with components specific to each production, which leads to a change in the chemical composition of the water. It is established that the largest production facility that discharges wastewater into the Chirchik River is the Chirchik Electrochemical Plant, located above all major cities and settlements of the Chirchik Valley on the II and III above-floodplain terraces. The main output products of the plant are nitrogen fertilizers [8-10].

CONCLUSION

In conclusion, thus the cover deposits in the irrigation fields of the Chirchik district serve as weak protection of groundwater from nitrogen contamination of fertilizers used in agricultural production. The intensity of the man-made agricultural factor as an indicator of natural water pollution depends not only on the number of fertilizers applied but also on the degree of "reactivity" of the system, i.e., on the dilution capacity of the aquifer and the intensity of water exchange processes. The results of the survey of wells and boreholes allowed us to conclude that the level of groundwater contamination in the floodplain territories from the I-th above-floodplain terrace of the Chirchik River in the agricultural development zones is significantly lower than in the II-th above-floodplain terrace, despite the weaker protection of the aquifer by cover deposits. Obviously, in this case, the prevailing purification factor is the intensity of water exchange. In general, the pollution of natural waters with nitrogen nitrate, as the main component of agricultural pollution, is widespread and is the result of the regional impact of this technogenic factor. Municipal wastewater from cities and settlements, including a mixture of conditionally clean and untreated wastewater from urban sewers and enterprises, is one of the most important technogenic factors of surface and underground water pollution. The impact of

the municipal factor on water pollution is directly related to the size of settlements and the saturation of their industrial enterprises [6].

Thus, the growth of water use and pollution of water resources necessitate the search for the most effective methods to achieve the rational use and protection of water resources, focused not only on increasing the efficiency of the development of water-intensive industries but also to minimize the negative consequences of the functioning of the national economy and its individual sectors. The most important factor in achieving the parameters of sustainable water use, providing the population and economic activities with water resources, and improving their environmental condition should be a mechanism for rational water use, which allows regulating the volume and quality of water resources involved in economic turnover and ensuring the increase in the efficiency of their use [3].

Water resources are the determining factor of life and habitat, the most important resource that all sectors of the national economy are focused on. In the context of population growth, the scale of production and the aggravation of the shortage of irrigated water, the tasks of rational use of water resources, reduction of water loss during transportation, as well as optimization of the structure of agriculture in general and the irrigated sector in particular, taking into account the degradation of environmental components, primarily land and water resources, are of strategic importance. The solution to this problem largely depends on the degree of perfection of the water resources management system, taking into account the involvement of the country's water management complex in the sphere of market relations. Sustainable water use is an activity aimed at ensuring the economic use, protection and reproduction of water resources, taking into account the long-term interests of the country's economy (basin) and conservation.

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