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PROBLEMS OF INTEGRATED MANAGEMENT OF WATER RESOURCES

(Tashkent University of Information Technologies named
after Muhammad al-Khwarizmi)

In this article one can see the problems and principals of many developed branches on managing water resources which are inculcated in many countries of the world as well as in Uzbekistan. Thus, a great attention is paid to the quality of water resources, ecological problems closely connected with water as well as the participation of the public in the process of the rational management of water resources. The traditional approach to water management as an engineering-based, based on technical solutions, has led to problems of water scarcity, pollution, conflicts due to ownership, social and political tensions.

The countries of Central Asia and the Caucasus in 2002 joined the Global Water Partnership (GWP).

The main goal of the water partnership is to promote the principles of integrated water resources management (IWRM), which are as follows:

- sustainable, stable, equitable and equitable water supply to water users and nature;
- water and environmental management within hydrographic boundaries in accordance with the morphology of a specific basin;
- accounting and involvement of all types of water (surface, underground, return) in water use, taking into account the climatic features of the regions;
- public participation of the population not only in management, but also in financing, planning and development of the water sector;
- close coordination of water use and all participating bodies with sectors and with different levels of water use;
- information support, openness and transparency of the water management system;
- water conservation and rational use of water resources, including not only the improvement of technical systems, but also the creation of a system of advisory services and maintenance of infrastructure.

In the opinion of IWRM specialists, the management system is based on the accounting and interaction of the possible water (surface, underground, return) and associated land and other natural resources within geographic boundaries, linking the interests of different industries and levels of the hierarchy of water use and nature management, involving all stakeholders in decision-making, planning, financing, support and development for the sustainable provision of the needs of society and nature.



The traditional approach to water management as an engineering-based, based on technical solutions, has led to problems of water scarcity, pollution, conflicts due to ownership, social and political tensions.

Therefore, in the advanced countries, the understanding that engineering and financial decisions in the past should be reassessed in the light of the natural and social values of nature and society has been strengthened.

The transition to IWRM requires the allocation of the following priority areas and management mechanisms:

- the formation of organizational, political-legal, management mechanisms that would suit all the states of Central Asia;
- stabilization of nature objects, prevention of violations of the ecological balance, formation of a system of interaction of all organizations that have certain powers and contribute to the stimulation of water management.

With integrated water resources management, issues related to the environment will play a priority role.

Our state inherited from the past the Aral ecological crisis, harmful to the health of the population and the environment of production, depleted water and land resources.

It should be noted that in recent years, important organizational, socio-economic and legal measures have been developed and implemented in Uzbekistan to provide, as is now customary, environmental security.

Ecological security should be understood as a system of nationwide measures aimed at the timely detection, prevention and suppression of environmental threats that could lead to serious political, economic, environmental, social and other damage to the state, society and the individual.

It should be noted that over the past years, Uzbekistan has adopted a number of laws regulating environmental protection activities aimed at preserving public health and rational use of natural resources.

IWRM is not the construction of another level in the interstate water resources management system, but the formation of an integrated, holistic approach to the creation and development of a unified structure for water management in the region, with stability and improvement of national governance structures. One of the main tasks of IWRM is to ensure the quantitative parameters of the water regime and water quality with strict limitations on the maximum allowable discharge concentrations.

The solution of IWRM tasks requires the concerted efforts of all stakeholders: water managers, water users, power structures and others. At the same time, it is necessary to take into account the following problems: availability of state and territorially-administrative borders in the region; branch isolation, significant differences in the levels of the hierarchy of water management; weakness of contacts and interactions of water users, the general public and the water management system, lack of a system of regular upgrading of water sector specialists; low level of the existing hydro structures, equipment, equipment and others.



Thus, the IWRM system can provide its own fundamentally new approach to the formation and improvement of the mechanism of interstate cooperation in the use of regional water resources.

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MATHEMATICAL MODEL OF INTERACTIVE NETWORKS

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At creation of any information network one of main are problems of receiving, preprocessing and distribution of information for the purpose of development of some managements of both local, and remote objects. At a large number of objects (terminals) the network uses multiple branched communication channels. At creation of such network by all means there are problems of rational use of channels. For the solution of these tasks it is necessary to have not only information on quantity of objects, geographical structure of their position, but also on functional features of information exchange between objects in system. In practice information networks have to provide information exchange between objects of system: automata, operators, computer etc. At a large number of terminals the transferred information volume significantly increases in network. For more effective use of channels of network enter special points of information processing (figure 1) into structure of network. At these points the information received from the terminals is processed, accumulated and redistributed to the required addresses.

At the same time in any information network distributed on big space channels of various physical nature can be used [1]. Such tasks require special approach to creation of information networks. For example, the part of canals can be realized on the physical communication lines providing a persistent connection between terminals. On the other hand, today the large role is played by wireless communication lines.