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Article

Issues of Formation of Ecological Culture of the Population based on the Concept of "Eco-Mahalla and Ensuring Rational Use of Water Resources

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Abstract: This article discusses the issues of protecting the ecosystems of mahallas and the formation of the ecological culture of the population in the conditions of modern urbanization and industrialization using the example of the mahalla "Sarichashma" of the Jambai district. The study examined the sanitary and ecological condition of the territory, the rational use of natural spring waters and the household waste management system. In addition, practical proposals and recommendations have been developed to ensure the sustainability of the local ecosystem based on nature-oriented solutions involving the cleaning of waterways, the expansion of green areas and the implementation of the principles of "Eco-Mahalla".

Keywords: urbanization, ecological culture, nature-oriented solutions, household waste, environmental sustainability.

1. Introduction

One of the most pressing problems of our time is the environmental crisis and its territorial consequences. With the acceleration of urbanization and urban expansion, anthropogenic pressure on urban and rural ecosystems is increasing. In particular, the insufficient level of ecological culture of the population leads to numerous negative consequences for the environment. In the process of urbanization, an increase in the volume of household and industrial waste in densely populated areas leads to pollution of atmospheric air and water bodies.

An effective solution to these environmental problems at the local level is the widespread introduction of the Eco-Mahalla initiative into urban and rural infrastructure, as well as changing the daily culture of the population. The main goal of the Eco-Mahalla initiative is not only to enhance the ecological culture of the population and the rational use of natural resources, but also to create awareness that humans are an integral part of nature. This approach will ensure the competent organization of measures for the rational use of water resources.

Efficient use of urban and rural areas, the creation of green zones, the introduction of water-saving technologies and the planting of trees are important conditions for ensuring environmental sustainability. The expansion and development of environmental initiatives contributes to the harmonization of the relationship between man and nature. Currently, the irrational use of spring waters, as well as overgrowth of the territory designated for the spring with weeds and its clogging with household waste, lead to inefficient use of water resources and blocking of natural watercourses.

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Under the existing conditions, the water of the spring (source) is in a condition that does not meet the requirements for drinking water, and mixes with rain and surface waters. A practical solution to this problem can be the organization of measures for the protection of spring waters, systematic purification of watercourses, the construction of modern ecological fountains and the introduction of filtration systems. The implementation of these measures will serve as the basis for the formation of an ecologically sustainable mahalla.

2. Literature Review

Uzbek researchers also studied the issues of the formation of ecological culture in mahallas, the rational use of natural resources and the creation of an ecologically sustainable living environment. In particular, H. Dadaboyev (2026) analyzed the role of civil society institutions, including gatherings of mahalla citizens, in the development of the ecological culture of the population. I.K. Ikramov (2025) highlighted the environmental aspects of the effective use of water resources in the country related to ensuring environmental and food security. S.O. Mavlonboyev and G.Z.

Djaxangirova (2025) investigated the issues of ensuring the environmental sustainability of food production and consumption. An analysis of these scientific papers shows that, despite the study of certain areas of this issue in Uzbekistan, there is a need for further development of research aimed at combining the ecological culture of the population, rational use of water resources, waste management and food security at the mahalla level within a single integrated assessment system.

According to the amendments introduced by Resolution No. 648 of the Cabinet of Ministers of the Republic of Uzbekistan dated October 16, 2025 to Resolution No. 95, there are requirements for the timely removal of household waste by special transport from container sites and residential buildings. In particular, waste removal from containers located on special sites of apartment buildings should be carried out daily (once a day). Waste is removed from individual residential buildings and private households using the signal system (as a specialized garbage truck arrives), but at least once every three days.

Compliance with the established deadlines for the removal of household waste and the fulfillment by the population of the requirements for their timely transfer to specialized services should be constantly monitored in accordance with current regulatory requirements. However, according to the results of the observations, currently household waste is exported from the population once a week, which indicates the need to improve the waste management system at the mahalla level.

In accordance with the sanitary rules approved by Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 95 dated February 6, 2019, a system of regular disposal of household waste should be strictly organized on the territory of the mahalla in accordance with the established schedule. The expected results can be achieved by creating special points for the separate collection of waste (plastic, paper and glass), taking into account the established standards and needs of the population.

Providing the green zone of the mahalla intended for sports, in particular the stadium territory, as well as the most visited public areas with special garbage containers (bins) will contribute to the formation of a careful attitude of the population towards nature and the improvement of waste management culture. During the observations carried out on the territory of the mahalla stadium, it was found that it is advisable to plant tree seedlings along the boundaries of the 110-meter-long site. This event will contribute to improving the quality of atmospheric air, creating a favorable environmental environment and promoting public health.

Materials and methods In this study, a comprehensive methodology was used to study the possibilities of forming an ecological culture of the population based on the concept of "Eco-mahalla", rational use of water resources and ensuring food security. The research used methods of system analysis, comparative comparison, sociological survey,

environmental observation, statistical analysis and integrated assessment. At the initial stage, the main factors characterizing the ecological sustainability of the eco-mahalla were identified. They were divided into the following areas: ecological culture of the population, efficient use of water resources, household waste management, development of green areas, as well as the cultivation of environmentally safe agricultural and food products. Qualitative and quantitative indicators characterizing the ecological condition of the studied territory were formed in each direction.

The method of sociological survey was used to assess the ecological culture of the population. The survey examined the level of rational use of water, sorting of household waste, environmental protection, the cultivation of environmentally friendly products in households, as well as the degree of citizen participation in environmental activities. The data obtained were subjected to statistical processing, on the basis of which an analysis of environmental behavior and the level of environmental responsibility of the population was carried out.

To determine the level of ecological sustainability of the mahalla, an integrated assessment methodology has been proposed, covering five main criteria. At the same time, the following weight coefficients were established:

- ecological culture of the population — 0.20;
- rational use of water resources — 0.25;
- household waste management — 0.20; - green areas and ecological improvement — 0.15;
- cultivation of environmentally friendly food products — 0.20. These coefficients are determined taking into account the priority areas of research, and their total value is 1.00.

3. Results and Discussion

The mahalla "Sarichashma" of the Jambai district, chosen as the object of research, has peculiar historical and natural features. According to existing assumptions, the name "Sarichashma" is of ancient Persian origin and means "the source of the spring" (the place of origin of the spring). This territory is located on the right bank of the Zarafshan River.

The Mirzoarik canal was laid near it in the XV century, and the Tykkizarik canal at the end of the XVIII century. Since ancient times, the local population has been engaged in agriculture, horticulture, animal husbandry and handicrafts. The territory is also considered one of the important trade and cultural centers located on the Great Silk Road. In the XV–XVI centuries, a disciple of Khudaidodi Wali, a representative of the great Sufi teachings, whose name has not been preserved in historical sources, lived and died here.

The mausoleum in which he was buried has been preserved to this day as a place of pilgrimage for Kamchin-ota. Currently, Sarichashma is a large mahalla with a developing infrastructure. According to the results of the analysis of documentation and a territorial survey, district communication centers, 2 general education schools (No. 20 and No. 44), 1 state preschool educational organization (pre-school No. 16), 6 family preschool institutions, 1 stadium and 1 rural medical center operate on the territory of the mahalla. The population of the mahalla currently stands at 6,986 people.

Landscaping of the territory around the memorial complex "Mangu ona Haikal" ("Monument to the Eternal Mother"), located on the territory of the Sarichashmin gathering of citizens of the Mahalla (SGM) and which is one of the cultural centers of the mahalla, which has historical significance since the Second World War, as well as the use of modern energy-saving lighting devices will contribute to bringing the concept of "Eco-mahalla"." in accordance with modern requirements.

Along with this, the creation of a continuous system of environmental education in educational institutions aimed at environmental protection, the organization of thematic meetings and gatherings in public recreation areas, as well as the holding of charitable public clean-up days are of particular importance. Currently, the irrational use of spring

waters, as well as overgrowth of the territory designated for the spring with weeds and its contamination with waste, lead to inefficient use of water resources and blocking of natural watercourses.

A practical solution to this problem may be the protection of spring waters, the laying of hydraulic concrete pavement to prevent erosion processes on the shores of the reservoir, systematic purification of watercourses, the construction of modern ecological fountains and the introduction of filtration systems. The implementation of these measures will become an important basis for the formation of an ecologically sustainable mahalla.

In the context of the ongoing development of industrial infrastructure in the study area, the preservation of public health and the sustainability of the local ecosystem is of particular importance. Given the proximity of production facilities to residential areas, in order to preserve the natural balance and biological diversity, it is advisable to implement the following preventive measures and nature-oriented solutions.

Widespread implementation of the principles of the "green economy" , the use of modern, environmentally friendly and resource-saving technologies in production processes, the creation of green protective zones between industrial areas and mahallas by increasing the number of ornamental trees and shrubs with properties of air purification and noise reduction. As part of increasing the social and environmental responsibility of enterprises and organizations, it is proposed to create "green gardens" on the territory, as well as to carry out joint landscaping and landscaping activities.

The implementation of the proposed measures will not only improve the microclimate and ecological condition of the territory, but also enhance the ecological culture of the population, as well as increase public attention to environmental issues.

4. Conclusion

Thus, the systematic implementation of sanitary norms and rules in practice, the strengthening of environmental education among the population and the implementation of Eco-Mahalla initiatives will contribute to the formation of a sustainable ecological culture in society and the preservation of a favorable environment for future generations. Transparent and consistent implementation of legal approaches implemented by the state and society will create a solid foundation for forming a responsible attitude of the population towards the environment and improving the environmental situation.

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