

ISSN 2181-8622

**Manufacturing technology problems**



# **Scientific and Technical Journal Namangan Institute of Engineering and Technology**

INDEX  COPERNICUS  
INTERNATIONAL

**Volume 8  
Issue 4  
2023**



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UDC 628.543:631.6.02:574

## STUDY OF THE PROBLEMS OF ATMOSPHERIC WASTE WATER COLLECTION AND GREEN FIELD IRRIGATION

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**Abstract:** All over the world today the problem of water scarcity is getting worse. At the moment, we see that in the countries of Central Asia, as well as in our republic, the shortage of water is increasing, the melting of ice reserves is accelerating, the level of reserves of river, stream, lake and groundwater is decreasing, and green spaces are shrinking. One of the most important problems is the prevention of water shortages and the establishment of an effective use of atmospheric wastewater in the water supply of green spaces.

**Keywords.** Atmosphere, wastewater, water treatment, green spaces, irrigation, reservoir, apartment buildings, water collection.

In our country, consistent work is being done in the field of environmental protection, rational use of natural resources, improvement of sanitary and ecological conditions.

At the same time, the results of the analysis conducted in this regard indicate the absence of a comprehensive approach and strategic planning in the implementation of state functions in the field of environmental protection, as well as the insufficient powers of the nature protection body to effectively perform the assigned tasks [1].

The growth of the world's population and industrial enterprises has a direct negative effect on nature, as a clear evidence of this can be seen in the decrease of natural resources. For example, we can see that the water shortage is increasing, the melting of ice reserves is accelerating, the level of rivers, streams, lakes and underground water reserves is decreasing, and green areas are shrinking. These emerging problems arise from the irregular and purposeless use of natural resources, as well as the fact that the targeted management system of these resources has not been fully

implemented [2]. Today, the use of energy and resource efficient devices is of great importance.

Based on the content of the research work, a number of methods were used, such as systematic analysis, comparison, mathematical, statistical, extrapolation, basic experimental research, comparison, remote methods, systematization of the obtained data in graphs and tables.

Today, in the Republic of Uzbekistan, due to the increasing water shortage and the inadequate protection of forests, the number of forest holdings is reduced to 7.7% of the territory of the republic. In order to protect the environment, to prevent water scarcity and the reduction of green areas, our state has adopted a nationwide state program of green spaces, and practical work is being carried out to establish green spaces and tree seedlings are being planted [3,4,5].

Planting a single tree does not solve this problem, it requires constant care to grow and develop. For the good development of any plants, water takes the main place. We can see in the table below that the amount of water used for irrigation varies depending on the type of plants.

Table 1

**Indicators on water consumption (QMQ 2.04.01.98)**

№	Water consumers	Water consumption l/m <sup>2</sup>	Watering period	The amount of water required for 1m <sup>2</sup> of land in the irrigation season is m <sup>3</sup>	
				2 times a day	1 time per day
1	Sprinkle water on the sidewalk	0,4	In one day 2 times	0,144	0,072
2	Spraying water on the green area	1,4	In one day 2 times	0,252	0,126
3	Irrigation of the garden	15	in 7 days 1 time	0,385	

It can be seen from the above table [6] that each plant's irrigation period and water requirement are different, so it is necessary to reduce water consumption and use alternative water sources.

Irrigation of green areas requires an average of 126 l of water per m<sup>2</sup> during the irrigation season. It may seem like a small amount at first glance, but it certainly causes some complications when watering green areas in an area that is not provided with surface water or irrigation channels. The only source used for irrigation here is potable water [7].

Using potable water for irrigation is nothing more than making two problems. For example, the use of potable water for irrigation causes a decrease in potable water reserves, an increase in water losses, a decrease in the pressure in the network, which causes drinking water not to reach the upper floors of houses and end consumers.

Clause 96 of the Resolution No. 194 of the Cabinet of Ministers of the Republic of Uzbekistan dated July 15, 2014 "On approval of the rules for the provision of communal services" allows the use of potable water for watering trees in the following exceptional cases: in the absence of irrigation water, when the capacity of the ISKH organization is available, and the local state according to the schedule approved by the authorities, it is allowed only at night (from 00:00 to 05:00) [8].

In exceptional cases, the use of drinking water for irrigation also has its own requirements. But consumers do not have a full understanding of this, so in many cases we can see that drinking water is used for irrigation during the day.

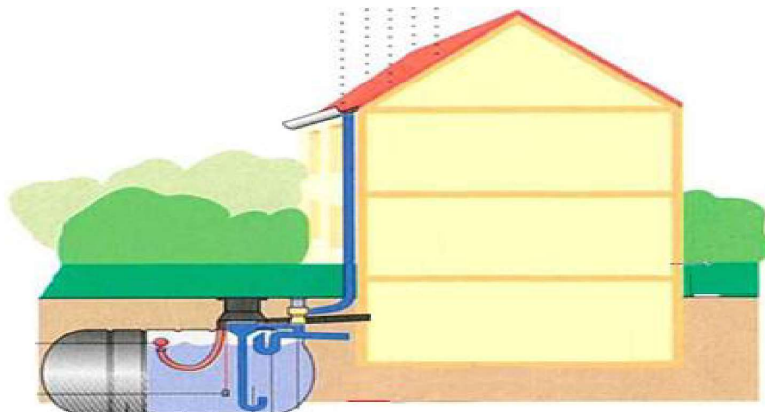
In order to prevent the wastage of drinking water, we can use other alternative sources, that is, we can save and expand existing green areas by collecting and treating atmospheric wastewater and using it as technical water to irrigate technical crops, green areas, and ornamental trees [9, 10, 11, 12, 13, 14].

In our country, up to 50 kg of snow falls on m<sup>2</sup> area and 150-300 ml/m of rain falls. The average duration of rain is 4-6 hours, in some cases it can reach up to 12 hours [15]. In large urban centers without irrigation canals, we can see even partial flooding during the rainy season, which inevitably leads to water accumulation in subways, apartments, basements of high-rise buildings and highways due to the absence of irrigation canals that drain atmospheric wastewater outside the city.

If we assume that the duration of one rain falls on average is 4 hours, from 36 to 72 liters of atmospheric waste water falls on m<sup>2</sup> of land.

The use of water for landscaping by collecting the water flowing from the roofs of residential houses and multi-apartment buildings in special reservoirs for collecting atmospheric wastewater is effective for increasing and preserving green spaces

[16, 17].



**Figure 1. Atmospheric wastewater collection tank**

If we look at the example of the city of Tashkent alone, as of January 1, 2023, there are 41,000 apartment buildings [18], the roof area of each of them is from 200 m<sup>2</sup> to 1400 m<sup>2</sup> (800 m<sup>2</sup> on average). A single rainfall produces 28.8 m<sup>3</sup> to 57.6 m<sup>3</sup> of atmospheric wastewater, which is enough to irrigate 41,142 m<sup>2</sup> of green space once.

Each multi-apartment house has a green area of up to 600 m<sup>2</sup>, which shows that it is possible to irrigate the green areas around the house for 34 days with one rainwater.

Today, in order to prevent the depletion of water resources, the widespread use of water-saving technologies and the introduction of re-technical irrigation of crops and green areas using domestic wastewater local treatment technologies is another solution to the problem [19, 20].

**Conclusions and recommendations.** Preventing water

shortages and shrinking of green areas all over the world, and at a time when surface and underground drinking water reserves are decreasing, the construction of reservoirs for collecting water from atmospheric wastewater to irrigate trees and green areas, as well as allowing the use of water for irrigation, is the most important way to prevent water shortages. we can see as one of the main solutions.

Relevant state, scientific and public organizations, multi-apartment housing management service companies, private homeowners, improving and applying technologies for collecting atmospheric water falling from the roofs of social sector facilities and using them for the purpose of watering trees in areas with a shortage of surface and underground water gives a good result, and increases the possibility of preventing water shortage in the rest of the regions.

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