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Executive Plans for Managing Water Crisis in Tehran

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ABSTRACT

Water is an essential element that is involved in all aspects of the lives of its inhabitants. The problem of water crisis is one of the problems that human society now faces. This issue has increased in the Middle East and Iran and is considered a very serious issue. Increasing the population of the Earth's crust and consequently increasing direct and indirect water consumption, limiting and not increasing fresh water resources, droughts, pollution of surface and underground resources, global warming, increasing water demand and consumption, increasing tensions International and even anticipation of a war on common water resources, the need to address the issue of water crisis, and how to confront and manage it. In the meantime, consideration of the water crisis and the presentation of water crisis management strategies for Tehran (as the capital and the largest metropolis of Iran) will be of primary importance and the results can be used in other major cities of the country. Therefore, in this research, we tried to investigate the issue of water crisis management in Tehran metropolis.

KEYWORDS

Population control, agricultural productivity, saving, water system improvement, drought preparedness.

INTRODUCTION

Water crisis is one of the most important issues in the world. About half of the world's population does not have enough water and, according to the World Bank and the United Nations, this figure will reach two thirds of the world's population by 2025. The increasing global population and, consequently, the dramatic increase in water consumption in the agricultural, industrial and health sectors, the occurrence of droughts, the lack of symmetric distribution of water resources in different countries, human activities and the pollution of surface and underground water resources, including factors This is a crisis. Also, the existence of common water resources between countries has led to many international tensions that have increased in the Middle East and in countries such as Iraq, Turkey, Syria, Egypt, Jordan and the Zionist regime. These tensions will become more serious in the future and will even trigger a war. Obviously, health, livelihoods and, in a word, the lives of people in the coming years, depend on planning, providing proper water and managing water crisis. In Iran, renewable water is severely decreasing and is expected to reach about 800 cubic meters by the year 1400, which means the water crisis, according to the Falkan mark. Climate conditions, moderate and asymmetric rainfall, and, on the other hand, a large population and an increasing number of them, are among these factors.

In the area of optimal water resources management in Iran, many studies have been carried out, which include water quality issues [1] life Environmental degradation [2] drought [3], flood [4-7], integrated management [8], construction and optimal operation of dams [9-16], climate change [17-19], sedimentation [20-21] and Other hydrological items[22-26]. Tehran, as the capital of Iran and the province, which includes about 20% of the population of the country, due to the high number of subscribers, the availability of limited water resources faces the problem of water crisis. On the other hand, considering the political, social, and economic importance of the capital, the need to examine the crisis, prevent it and manage it doubled.

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METHODOLOGY

1. Case study (Tehran):

Tehran is geographically located at 51 degrees 17 minutes to 51 degrees 33 minutes east and 35 degrees 36 minutes to 35 degrees and 44 minutes north latitude. Tehran's current altitude varies from 900 to 1800 meters, although in some areas in northeastern Tehran has reached 2000 meters. Tehran is warm and dry (with the exception of its northern mountainous regions, which are slightly moist and mild). The maximum monthly temperature is Tehran 29 and at least 0.1 degrees. The average amount of rainfall in the city of Tehran is low and average in the last thirty years is about 220 mm during the year and the number of frosty days is recorded 36 days a year.

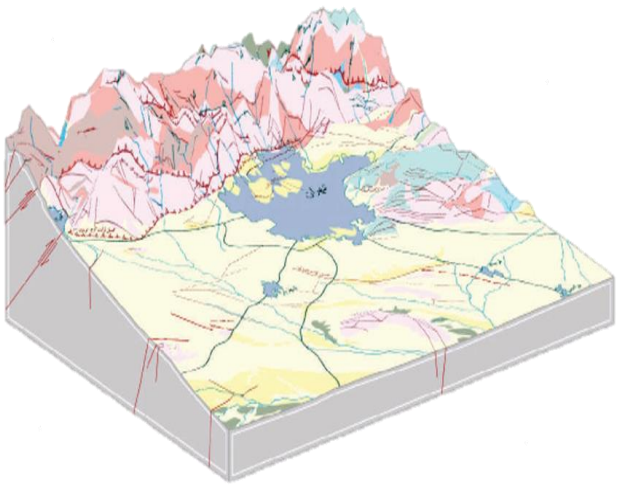

Fig.1. Geomorphology Diagram of Tehran

2. Water Management Solutions in Tehran:

2.1. Population control in Tehran:

The most important problem that Tehran faces in the context of the water crisis is the increasing increase in its population. One of the most important factors is migration. In order to decide on this in the water sector, first of all, the future situation of the city of Tehran, its consumption and the ability of regional water and water and sewage to supply and distribute water for the three long-term (50 years) middle-term (25 years) and Short term (10 years old).

The following strategies can be effective in controlling the population of Tehran:

1. Development of other cities and provinces, creation of employment opportunities, educational services, medical treatment and welfare suitable for other cities.
2. Awareness of the cities of other cities about the problems and problems of Tehran
3. Establishing facilities for the departure and return of those who can live in other cities
4. Provide incentive schemes such as the introduction of management oversight systems (such as more taxes for city center residents)
5. Localization of universities, the creation of priority for the purchase of housing and employment for the birthplace and residents of the old city
6. Purchase of permits to build and permit construction with the coordination of the water and sewage company
7. Consider the symmetric distribution of the population in different parts of the city

2.2. Raising agricultural water efficiency:

On the other hand, according to the FAO report, the irrigation efficiency in the agricultural sector in Iran is only 33%. This means that two thirds of the water allocated to the agricultural sector is thrown, or 62% of Iran's total fresh water is currently wasted. This figure is a disaster for the country, under the pretext of consuming 94 billion cubic meters a year, actually 58 billion cubic meters. With this amount of water, water can be provided for 4833 days, i.e., about 13 years, according to the average consumption of 150 liters of water per day per person. After justifying the authorities, the following measures are proposed as implementing measures to increase water productivity:

1. Train farmers and encourage them to use new irrigation methods (such as dripping methods)
2. Providing incentives and incentives for farmers who use modern irrigation techniques.
3. Manage and direct more agricultural products with more value added
4. Managing planting products in different parts of the country (lower consumption and more economic efficiency).
5. Increase the price of water allocated to farmers
6. To prevent and supervise the construction and uncontrolled use of wells and groundwater
7. Penalties and punishments of consumers over permitted (due to the area and type of cultivation and environmental conditions)
8. The reduction in consumption of 5% to 6% in the agricultural sector (which is easy to achieve) is equivalent to the total consumption of drinking water in the country, which means that there is no water crisis in the country, especially metropolises such as Tehran
9. To allocate a portion of agricultural water to drink

2.3. Improvement in water production phase:

By optimizing and improving water production, it is possible to reduce the needs of subscribers by using less water, which is effective in preventing the occurrence of a crisis. Therefore, the following measures are proposed in this regard:

1. Improvement of wells
2. Improvement of refineries

3. Installing the meter in the supply sources
4. Establishment of remote control systems
5. Establishment of preventive maintenance and maintenance systems

2.4. Improvement and Optimization of Water Transfer System:

One of the other parts that should be considered to reduce water losses, save it and, in the long run, prevent water crisis, is the transfer of water. The following measures to improve and improve the water transfer system are useful:

1. Modification of transmission lines
2. Optimization of pumping system
3. Reconstruction of storage tanks
4. Establishment of remote control systems

2.5. Improvement and Optimization of Water Distribution System:

The last part that needs to be considered before the water reaches the consumer is the water distribution system, the following measures are proposed to improve and optimize the system:

1. Pressure management (study, equipment supply, installation and installation)
2. Separation of the municipality's green space and the implementation of our Memorandum of Understanding between the Ministry of Energy and the Municipality
3. Renovation and network reconstruction
4. Install the meter on the network input in order to monitor the consumption of the network
5. Deployment of remote control systems
6. Changing the control of the subscribers
7. Organizing systems for relief and emergency units
8. Leak detection
9. Establishment of preventive maintenance systems
10. Installing downgrading appliances with priority in public, public, educational and cultural centers (reducing and reducing valves, laser and optical valves, as well as air handling units capable of mixing water with air to reduce consumption, as well as flash of tanks that are mixed with air).)
11. Implementing the Memorandum of Understanding between the National Engineering and Water Management Institute in accordance with the 16 National Building Regulations
12. Replacing refined waste water instead of drinking water for irrigation of urban green space with priority of big cities and industries

2.6. Create a culture of saving and advocacy for people:

This indicates the lack of culture and proper information about water. The extent to which water users and consumers (consuming quality) use will play a key role in the amount of water consumed (intake quantity). If the limitations of water resources and its potential and actual problems are well explained to the public and strategies for saving and preserving water resources are taught. Firstly, it can be used to control water consumption to a large extent and bring it to the standard level; secondly, by reducing consumption by citizens, due to the large population of Tehran, a large amount of water can be stored and used when needed. Education and culture should take place in different spaces (media, schools, state centers, hospitals, etc.) for different ages and for different classes. Direct and indirect education through audio and video, as well as children's education and teenagers can play a big role in this field from an early age.

2.7. Preparedness for drought conditions:

Emergency crisis management will lead to a loss of capital and a lack of proper utilization of the country's capabilities without accurate knowledge of the phenomenon of drought and its real dimensions. The interaction between population growth and hydrological changes on increasing consumption and decreasing water production and ignoring drought in previous studies and plans requires a national determination and coherent and short-term planning in this field. On the other hand, it is necessary to provide the necessary information and data to coordinate and collaborate between different organizations and ministries, which can be a deterrent and delaying factor. It is suggested that the Center should be established for the above mentioned activities and all necessary activities in the Center should be planned and implemented. This center can operate under the authority of the National Disaster Reduction Committee of the country.

The problem of drought and the resulting damage is one of the important issues in Tehran. Water shortages due to droughts, water rationing and some hours of water shortages in Tehran between 1997 and 2002 have not yet been cleared by the public and authorities. Recent developments in Tehran have proven the importance of the issue for us. The prediction of the time of occurrence, the duration of the drought and its extent and quantity will help a lot to manage the crisis.

CONCLUSIONS AND SUGGESTIONS

In general, crisis management is carried out in the three phases before, during and after the crisis, and according to the principle of logic, the most energy and planning should be done in the pre-crisis segment. To manage the water crisis in Tehran's metropolitan area, the following strategies are applicable:

- Population control and immigration
- Increasing the efficiency of the agricultural sector and allocating fresh water saved to the drinking sector
- Improvement in water production phase

- Improve and optimize the water transfer system
- Modification and optimization of water distribution system
- Create a culture of saving and advocacy for people
- Preparing for drought conditions
- Prioritize subscribers and prepare a water supply program

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