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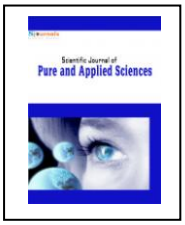

Original article

The use of packed water in urban drinking water and its advantages to other methods of separating drinking water from undrinkable water (the case study : Ferdows city in South Khorasan)

M. Akhgari[a], A. Mansuri[b,*], S. Mansuri[c], S. Mirzaei[d]
[a]*PHD student of Geography, Chairman and member of faculty Payame Noor University, Ferdows.*
[b]*Senior expert of geography University lecturer Payame Noor and azad Ferdows.*
[c]*Semester student of civil engineering, Zanjan University.*
[d]*Senior expert of geography, urban planning.*

*Corresponding author; Senior expert of geography university lecturer Payame Noor and azad Ferdows.

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ABSTRACT

Today, more than one billion people of the world don't have access to safe drinking water. Therefore, due to the population increase and consequently increasing water needs, and the reduction of drinking water sources available, separating drinking water and non-drinking water seems necessary. In this article, the use of packed water is compared to other methods, such as two networks (drinkable and non-drinkable) water supply, public water stations, purifying drinking water, and transferring high quality water from distant areas. Some statistics and information about the cities of Birjand, Ferdows for statistical analysis are used. Most scientists believe that changing the world weather is because of the greenhouse effect, which has had many harmful effects on the planet. With the increasing of the use of fossil fuels and accumulation of pollutant gases in the atmosphere of the earth which are the results of spreading industries and cars in the recent centuries, the greenhouse effect has occurred that the heat and returning long waves can't go out of the atmosphere, and consequently the earth temperature has increased. The increasing temperature phenomenon then would be a sign of a trend to a drier climate.

1. Introduction

Water as one of the main sources of energy for the continuity of life. It is not substitutable and is only available regionally. About 71% of the Earth's surface is water and from these 97.4 percent is salty which is located in the oceans and seas and only 2.6 percent of these is fresh water. From this 70 percent i.e. 1.82 of the total amount of waters is in the South and North Pole glaciers, an only less than 1 percent in the form of springs, rivers, lakes and underground water can be used for human. And from this 1 percent, 92 percent is used in agriculture, 3 percent for drinking, and 5 percent is used in urban and rural areas hygiene uses.

Now, considering that the amount of water needed for drinking every day human 1.5 to 2 liter and cooking purposes, as well as about 3 liters was enough And the sum of these two numbers per capita ratio of 150% of the consumption of each person about 3 liter over, the question is "whether it is essential 3 percent because of drinking water consumption of delivered in all the towns and villages of drinking quality and or in a State of reflection is alarmingly, refined.

Common methods of water supply in cities and compare it with the water distribution system package is aimed at optimum use of the limited resources of freshwater.(Engineers company advisor water tus, 2010).

Groundwater water resources are required for humans, especially in dry areas and atmospheric precipitation is the main source of underground waters. Drought and heavy digging wells is so effective in destroying all the qanats have been plain to the many subterranean clay dried and of page and the list of the country's water resources have been removed.

Most canals are dried in Khorasan region, as well as in other parts of the country (Kardowani, 2008,243). Unfortunately, Area of Ferdows city also caused drought has dried up a lot of aqueducts.

Urbanization and the development of industry and agriculture has led to increased demand for water resources. The increased demand in some areas has gone so far that the amount of water available and the water crisis has caused such a way.

Aqueduct or canal was one of the most complex and the most amazing inventions of human history is to meet the vital needs of human societies, the water in the shallow water areas and there is no water (Velayati & Taleshi, 2009).

Ferdows city located in the northwest of South Khorasan certain latitude (55, 5-58 and 57) and altitude above sea level (1275 m) has an important role in creating a climate of

2.2 Climate : Due to Ferdows city located near the central Iranian desert climate is dry and desert . Temperature difference between day and night in the big city mix is dry and hot summers and cold winters , low rainfall levels in the city are mainly showery nature Average temperatures in the warm months to 30 ° C above zero. Dry period city for more than 240 days it begins in March and ends the year after a continued drought in recent years, a lot more has severe the drought during crop years 79-78 and 90-89 with rainfall , respectively, 7/56 and 77 occurred in the respectively, 17 and 22 days of rain have been based on the assessment of drought indices for drought situation in the central city can be realized

2. Common practices in urban water supply

2.1. water quality for all uses of remote and distributed on existing networks

In most urban areas country especially in hot regions of dry and possibility water extraction from the table of water quality problems due to superficial cities existed and the neighboring plains and some cases of remote areas with distance even more than 100 miles of water.

production expenses, transfer and storage water need long term city with a population of 30000 people in accordance with the table 1.

Cost (million $)	A description of the cost
12600	Extraction of 150 liters per second of water through drilling and equipping 7 wells
130000	Sweet water transfer from the yonder with length of 100 km and with an approximate diameter of tube Mm400
1000	Build a storage tank) at least 5000 M³ (
152600	The sum total of

(Kardowani, 2008)

The current cost of the utilization of the facilities including the above personnel wages beneficiary cost electricity and maintenance costs about 100 million Rials in the month is estimated to be.

2.2. Water purification existing sources in cities near

by considering the social and cultural issues and the lack of public acceptance for water from the networking or using water packaging, for some of the cities established refinery water and the distribution of water purification in the existing distribution network and executive proposal has been that the cost of the filtration tanks and transfer the existing network and the cases have been implemented in the country for the city-30000 this research figure for example to 125000 million Rials.

current expenditures of personnel, electricity, changing and maintaining system repair and maintenance of these also monthly amount 330 million Rials is estimated to be.

2.3. Separation through the execution of the second channel for distribution of water sweet

One of the other methods of optimal use of network implementation of quality waters in separate cities and the distribution of water quality in their homes. In this method the method because little network to lower per capita consumption of less than tanks with the volume of the main network to use. Estimate done for city costs for example the implementation of the main networks and secondary and the construction of reservoir installed separate water system central baselessness and the cost to the table number 2 is presented. In this method of water need each person 35 liters per day is estimated to have been. Table No. 2) (cost of implementing the main and subsidiary network.

Table 1
Cost of production, transmission and storage need blue

Cost (million $)	A description of the cost
21600	ا The original network run with up to 250 mm and a length of 63 intra ventricular approximately 40 km
3000	Implementation of subnet with intra ventricular 40 up to 100 mm and km
5000	(Build a storage tank (at least 2,500 M³)
15300	Install the ramifications to the number 9000 series
7000	Construction of buildings and installation of desalination plants for the extraction of Dubai 12 liters per second
78900	The sum total of

(Velayati & Taleshi, 2009 , 1996).

The current cost of the utilization of the facilities including the above personnel wages beneficiary cost electricity and maintenance costs about 200 million Rials in the month is estimated to be

2.4. Separation through the execution of the regional stations took to water distribution sweet

The implementation of this system during network transmission lines and very has been less than cost and certainly is less, but need culture to accept water from the trouble station by the people from the control on one hand and observe health cases to the use of suitable vessels and cleanliness of networking on the other hand. The implementation of this system did not cost in the table No. 3 is presented. In this method of water need 21 liters per person per day is estimated to have been.

Table 2
The cost of implementing the system.

Cost (million $)	A description of the cost
2800	The original network run by intraventricular 63 to 90 mm and length of about 10km
8000	Construction of the station picked up to # 20 about
2000	Build a storage tank (at least 1000 m3)
4000	Construction of buildings and installation of desalination plants for the extraction of Dubai 5/8 l/s
16800	The sum total of

(Raziei & Shoukouhi, 2001).

The current cost of the utilization of the facilities including the above personnel wages beneficiary cost electricity and maintenance costs about 110 million Rials in the month is estimated to be.

2.5. Distribution of water quality packaging

One of the other methods of distribution of drinking water consumption with the aim, using water packing. In most developed countries and in developing this method has been introduced and water distributed in the network plumbing potable and non or very low quality. average per capita water consumption in the world packaging 89 liter while that amount in neighboring countries like turkey and United Arab Emirates and 70 in Iran only 15 liters per year for each person.

Therefore it is observed that for the implementation of this so far water distribution system measures and facilities for special is not the critical condition country water resources, culture and necessary spending and facilities to encourage citizens to use the packaging of the water and avoid the distribution of sweet water and or refined for all expenses (like washing clothing and dishes, air conditioning and refrigeration were, bathing and health expenses, washing houses and cars and etc.) is necessary it seems.

In the table No. 4 factory estimated construction cost and water distribution in doors of the houses with the use of Polyethylene containers 20 liter or 10 liter with regard to per capita consumption 5 liters per day for each person, presented in this method cost equal to 100 Rials for each liter of water the consumers at delivery to.

Table 2
Water distribution and plant construction costs

Cost (million $)	A description of the cost	Row
5500	Build niches and office buildings and guard	1
4000	Machinery and equipment	2
1000	The cost of setting up and installation	3
10500	The sum total of	4

(Raziei & Shokouhi, 2001).

The current cost of the utilization of the facilities including the above wages personnel beneficiary and the distribution of the electricity cost and maintenance cost about 450 million Rials in the month is estimated to be that by receiving paid 100 Rials for each liter of water the consumers compensate this figure.

3. Comparison methods have been presented to provide drinking water

Methods compare the above-mentioned in the form of table 5 is presented.

Table 4
Comparison of methods

The current monthly fee (million $)	Cost of the initial investment (million $)	%	A description of the proposed methodology
100	152600	25-30	Provision of remote (no separation of uses)
330	125000	55-60	Construction of water treatment plants and distribution of quality
200	78900	20	Isolation with two independent network
110	16800	20	Picking stations
Popular participation	10500	2	Water distribution package

(Mir-Bagheri, 2000).

4. The results and the discussion

with regard to cases and comparison as in the table 5, it is observed that two methods of first and second cost due to high initial investment and wasting, both to economic and to protect in necessity of the reserves of sweet water and عذم using it for expenses other than necessity of appropriate. But in case of lack of culture and propaganda in line with enough explain water resources problems and limitations at first may be more welcomed by people.

third method compared to the choice of the first and second expedient to more economical and less wasting. Also due to comfortable access to drinking water in their homes quality of the public acceptance also will enjoy. But with regard to problems of the utilization of underground facilities in the towns and the number of different networks such as gas, electricity, telecommunications, sewage and water adding a network and impose other costs in addition to the current fixed costs initial proposal and has not been this option compared to two options pale next.

option IV and V in the initial cost difference but so in principles of health care, wasting less and also make it easier to access in the manner of distribution of method of V, water distribution packaging stations compared to the construction of better understanding. Therefore society opinion to the use of the water by packaging relevant authorities scientific community and university and evangelical cultural considered essential in guarding and protection of vital water this blessing and played a major part will be replaced.

In fact lack of enough income from recent acclimatization and the decrease in water resources and under cultivation. so it can be said, the shortage of water resources the main cause of migration from region to the(Mir-Bagheri, 2000, 89)

The occurrence of successive drought 13 years old will decrease and drastic sources underground waters. climatic condition of town with any method of classification that implementation of Our type of climate and dry desert would so what is obvious is another popular target drought in the region is the high intensity of drought one of environmental events that particularly in dry regions should dry Iran occur and it caused a lot top Environmental damage. Drought is mainly the result of the lack of shower,. In sensitive regions dry half decrease in rainfall and influenced a lot on water resources. 45% (Raziei & Shokouhi, 2001, 45)therefore most important drought in reducing land and water resources (underground).

5. Appreciate

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