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Using Traditional Methods For Collecting Rainwa

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ABSTRACT: More than 50 billion cubic cm ofthe river floods of our country are annually wasted of which the financial and human losses would amount to billions of Rls and tens of people while 90 percent of the country is confronted with shortage of water.Nowadays ecological changes, insufficient rainfall, limited and constant water supplies,economic development, industrialization of cities resulting in increasing demands for various necessities would provide a number of interrelated factors that illustrate water crisis in near future. Effective use of the existing water supply and attempts to access the new sources might be two temporary major solutions. Planning in order to collect rain water from the surfaces in urban areas (airport runways, streets, roads, and roofs) could supply reliable water sources in certain regions. Rain collection is one of the most prominent and applicable techniques of managing shortage of water. Proper consumption and distribution of water among different sectors, minimizing the risk of crisis, managing and maintaining water sources are among the advantages of this method.This study aims at getting acquainted with traditional methods in order to collect runoffs and managing effective use of rain water.
Key words: water crisis, effectiveness, surface flow system, collecting rain water, runoff

INTRODUCTION

Using Traditional Methods for Collecting Rainwater

There is no doubt the 20th century has been one of the most wonderful ones in the world history which is not to be necessarily considered positively and in many areas it could be regarded as one of the most appalling periods of mankind. Inadequate rainfall, extension of dried rivers, shallowness of rivers, fewer consistent rivers, brackish surface and ground water sources in certain regions have made water collecting and managing its exploitation very significant.This has made people of this country plan for every drop of water. Billions of cubic m of water and soil from river banks and beds in arid and semi-arid areas are annually washed away by floods the financial and human loss of which could amount to billions of Rls and hundreds of people. This happens while the major part of country is seriously threatened by water shortage.

The daily increase of the population along withmisusing water has brought about a lot of problems in providing drinking water for urban and rural areas. As water is mainly exploited for agricultural activities it is strictly necessary to conduct research on different methods of collecting rainwater and economical ways of exploiting it.

One of the methods which can indirectly decrease country's reliance on orthodox water sources such as wells, aqueducts or rivers is the direct collection of rainwater in order to saveand exploit it where it is raining. Since it rains almost elsewhere in Iran, even though it is inadequate, it can make up for the current shortages conditioned that it is used under proper administration. The existing old water reservoirs with various architectures in most of the arid areas of the country indicate the importance of rainwater collection for different purposes in the past. This procedure is traditionally known by different terms as specified by the region.

Iran is situated in an area of which the annual average for rainfall is one third below the international standards and that is about 280 mm. As a result, Iran belongs to arid and semi-arid areas of the world and has been facing water shortages since a long time ago. Collecting rainwater for human, animal and agricultural purposes has been customary for centuries. Native structures in the pastures of arid and semi-arid areas can best exemplify it. Conventional procedures for collecting fresh rainwater, proper exploitation, making the most of water and maintaining soil have all been based scientifically.

Rainwater collection has been successfully practiced as supplementary irrigation in many of arid areas. To do so, rainwater from neighbouring places is collected and saved for plants during shortages. Rainwater for agricultural purposes in arid areas is collected in two main types. The conventional manner relies on direct use of collected runoffs for watering plants. In modern methods, a tank is used for collecting and saving rainwater so as to water the plants during shortages or at rain intervals. Research in this regard indicates that the direct method cannot be successfully practiced in areas where the rain season and watering time do not happen at

the same time as it is impossible to keep the moisture of the soil (during the wet season) for the dry season and consequently the plants would die.

Choopani*et al.* (2013) have introduced practicing the native knowledge in natural capacities in Hormozgan.Shahvali and others (2013) have studied optimization of native structures for collecting rainwater in the pastures of arid and semi-arid areas.In his research, Dastourani (2009) studied rainwater collection from ready urban flows (roofs, insulated parts of factories and warehouses, airport runways, streets, roads, etc.) which can be proper and reliable water sources for developing the green areas in many parts of the country.

METHOD

The method in this study is a qualitative one since it focuses on traditional methods of gaining water and collecting rainfall.

Methods of Collecting Rainwater

Glossy Flows

Using this device in the Middle East dates back to about 4000 years ago. It is constructed in arid and semi-arid areas where rain falls severely just during certain months of the year or gaining access to water sources like wells and aqueducts is difficult or what is available is undrinkable to the cattle being bitter or brackish. Thus water is always hard to come by in such areas and for drinking purposes the people would have to resort to collecting and reserving rain fall during rain seasons in order to use it slowly. As for the cattle and pastures, the farmer's glossy reservoir contains 120 cubic m of water with a volume of 1200 square m. The pasture is used by 5 nomadic farmers who spend winter quarters there and are always in difficulty providing water for cattle and household purposes.

Stone Water Reservoir

This structure used to be made in arid and semi-arid regions where people and cattle kept coming and going to be filled during rainfall and to be exploited with care. It dates back to Zoroaster's times. This structure is made up of two main parts: the body carved out of stone in a piece of rock and a lid in the form of a cylinder or an oblong shaped out of stone pieces in order to prevent cattle or wild animal getting into the reservoir.

Reservoirs are of two main types:The ordinary ones located in quarters, caravanserais/ desert inns, villages and built out of stone pieces on caravan routes and the private ones for house purposes. Water reservoirs were moved to villages and towns so that people could suitably gain access to water and aqueducts. Regarding shape and appearance, they include the following types: the deep domed ones, those carved out in mountainous areas, the natural ones and the long ones

Water Holes

They are natural cavities in mountain rocks which hold rainfall and meet the needs of cattle and farmer for a while accordingly making the cattle graze where there is such a structure. They have been made through erosion in valleys within millions of years in the form of stairs and stratified extending from the top of the valley to the lowest level. They are oval in shape and in different sizes in a way that some of them may contain 10 to 10000 liters of rain water. Such water holes are picturesque during raining.

Cattle Wells

Since a long time ago humans have dug wells to gain access to groundwater. Ordinary wells are dug by hand and have been used for thousands of years. To provide the cattle with water people dig wells at mountain feed from which water flows like a water spring, thus termed as cattle well.

Today the use of hand-dug wells is prevailing and they are highly reliable in arid areas. Cattle wells are very important in areas where it is not possible to gain access to springs, aqueducts and rivers because farmers and herdsmen have a consistent water source for their animals. Cattle wells consist of a well, a wooden wheel installed over it and a pond for animals to drink. The well is 2 to 20 m in depth and 1 meter in width.

Nomads' Ponds

There are usually numerous springs on summer quarter pastures the current of which flows at 2 to 5 liters per second and their water is not that exploitable if used individually or the bed is sandy through which water penetrates quickly. Therefore, the nomads try to build ponds as a reservoir in order to exploit the water.

Collecting Rainwater FromFlows (Roofs, Insulated Surfaces in Factories and Warehouses, Airport Runways, Streets, Roads, Highways, Etc.)

Since it can be exploited for drinking purposes, collecting rainfall before reaching the ground has the advantage of being clean. In so doing, the gable roofs of houses, factories and reservoirs come into use.The

amount of water collected this way depends on two factors of how much rainfalls and how extensive the area is. This method is more economical than other ones as it is needless of being prepared already.By practicing this method in parts of Africa, Palestine, parts of Rajasthan in India and some areas in Bermuda nowadays people rely on this procedure for drinking purposes.

Collecting rainwater from highway surfaces

As the surface is already prepared this method is regarded as proper and very economical. Research in the United States has proved it efficiency (Abrishami, 2007). The water obtained this way could be used for trees and green fields or conducted towards the farms around.

CONCLUSION

As the human's most important factor of life water not only plays a crucial role in the lives of all creatures but also influences political, economic and cultural affairs. Research and studies concerning water such as discovering, extracting, exploiting, maintaining, sanitation and piping are among the world's most challenging issues. All this indicates that due to people's need in clean fresh water they trying to develop and put together traditional methods of collecting rainwater with today's findings in this regard and mind every drop of it. What follows here denotes the effect of small scale rain flows in managing and exploiting floods and runoffs in arid and semi-arid areas. Therefore, it is inevitable to restore certain forgotten methods for which public and private financial supports as well as applied and fundamental studies seem necessary so as to properly recognize and evaluate their efficacy. There is adequate evidence that there will be fights over water sources soon. Major and minor policy making on water sources in countries suffering from water shortage involves appropriate and economical use of the existing sources and attempt to gain access to new and reliable water sources.Since on the one hand the amount of rainfall in Iran is gauged as a third of the international standards and a major part of the country is located in arid and semi-arid areas where there is serious shortage of water or no drinking waterand on the other hand such areas are apt to be populated and economically developed, rainwater collection and waste management are the techniques in this regard as proper use of water pivots most of the national projects, industries, husbandry, agriculture and many other activities.

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