

MODERN METHODS OF WATER CONSERVATION IN INDIA

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ABSTRACT

Water conservation includes all the policies, strategies and activities made to sustainably manage the natural resource fresh water, to protect the water environment, and to meet current and future human demand. Population, household size, and growth and affluence all affect how much water is used. Factors such as climate change have increased pressures on natural water resources especially in manufacturing and agricultural irrigation. Many Indian cities have already implemented policies aimed at water conservation, with much success.

KEYWORDS: Water conservation, sustainably, human demand, agricultural irrigation

OBJECTIVES

1. To know the need of water conservation
2. To study the Modern Methods of Water conservation

METHODOLOGY AND DATA COLLECTION

Present research article is informative. Data required to complete this article has been collected from various means of secondary sources like News bulletin, Published and Unpublished Research Papers and Internet

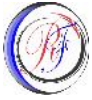
Protection of water from every type of pollution means saving of water by wise and economic use of water. There are several methods of protection of water. These are as follows

1. PROTECTION OF WATER FROM POLLUTION

If the total fresh water available on the earth remains pollution free, it is sufficient to meet the drinking water needs of the existing population of the world, unfortunately a large portion of fresh water does not remain fit for use of the living world due to increasing economic activities, urbanization etc. Oceanic water in the form of ecological system of seas is an important environmental system, but during the last century pollution has spread in large proportions. Surface water is mainly found in rivers and lakes and underground water is found under land at different depths, but which have become polluted. Large cities located on banks of rivers are directly disposing off different wastes without treatment in rivers. Similarly, tourism has spread pollution at war speed on famous lakes and sea coasts. Man is greatly dependent on groundwater for his water related necessities, but some special industrial units have also polluted this amount of water stored in the security cover of the ground.

The entire available water store on the earth should be kept pollution-free because pressure of demand for water is increasing on a large part of the earth. Normally, it is presumed that sea water being saline, is not fit to be used by human beings, but indirectly it is useful for maintaining living organisms with whom man is related, e.g., fish provide nutrition to a large portion of the world.

Hence, it is necessary to have a cooperative policy at the international level for control of oily and radioactive pollution of the oceans. The origin of water crisis initially started due to its pollution and qualitative deterioration, which became acute due to increasing demand for it. For preventing water pollution, important water sources should not be made places for disposal of wastes. Industrial units should dispose of water only after its treatment. Bathing and other such activities should be prohibited near drinking water sources.



Weeds produced in water should be controlled. Water should become re-usable after physical, chemical, mechanical and organic processing methods. Rivers and lakes should not be used as canals for transport of goods as is being done in Rhine River of Europe, Volga river of Russia, and the Ganges, Yamuna and Kaveri (Cauvery) rivers in India. Thus, the most important aspect of water conservation is control on water pollution.

2. REDISTRIBUTION OF WATER:

Water found on the surface of the earth is not equally distributed. Existing form of distribution also becomes a reason for the water crisis. In the African continent, though there is maximum hydro electric production because of excess availability of water in Mediterranean regions, but the Sahara desert situated in the north of Africa and the greatest desert of the world, suffers from water crisis for the whole year. Droughts faced by the Sahel region in the north of Sahara desert are world famous. Similarly, there is maximum rainfall of the world (1,187 cm. in Mawsynram) in north-east India, whereas there is only 50 cm. rainfall in the west. As a result of it, more than 60 per cent portion of water of Brahmaputra and its companion rivers in the north east flows to the saline seas uselessly, whereas rivers of western Rajasthan remain dry for most of the time in a year.

Hence, by arranging supply of water from areas having lesser demand to the areas having greater demand, water crisis can be minimized. By construction of surface water reservoirs and storage of excess water in them, supply can be made to scarcity affected areas. This work can be accomplished by development of water reservoirs and canal network. Excess rainfall water which flows away from rivers without being used, can be stored by construction of water reservoirs.

Redistribution of water is also possible through canal system. Canal system transfers water from excess rain water areas to scarce rain water areas and conserves water for different uses. Indira Gandhi Canal is such a type of canal system which has brought water of Himalayas to western Rajasthan and changed the arid ecology.

Thus, by developing artificial canal system through artificial rivers, excess water can be conserved. Though development of canal system will have to face geographical, economic, social, cultural and political problems, but its future results would be favourable from the geographical point of view.

3. RATIONAL USE OF GROUNDWATER:

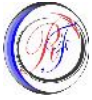
Groundwater meets 25 per cent of total supply of water in the world, remaining 75 per cent supply is met by surface water sources of rivers, lakes etc. Demand for groundwater goes on increasing in proportion to its available quantity due to which quantity of groundwater goes on decreasing. After exploitation of groundwater, its re-infiltration takes a very long time to complete.

Hence, groundwater exploitation should be only in proportion to its recharging capacity. In India, the maximum groundwater is utilized for agriculture. Instead of growing crops requiring water according to agricultural climatic conditions, crops of commercial importance requiring more water are grown, due to which overexploitation of groundwater is done.

By making only conscientious exploitation of groundwater, it can be proportionately conserved. For that, crops requiring lesser water should be given priority over crops requiring more water. Lesser water should be used by industries. For recharging groundwater, necessary drainage area should also be made available.

4. POPULATION CONTROL:

Water crisis has assumed dangerous proportions due to fast increase in population and deterioration in quantitative and qualitative aspects of water resources. Demand for water is



continuously increasing. Along with population increase, demand for fresh water has increased due to expansion of industries and increasing urbanization.

Population of the world would become around 800 crores by the year 2025. In this context, the United Nations Organization has warned that in case population control is not exercised, the whole world will have to face grave water crisis. United Nations Organization declared the year 2003 as the 'Fresh Water Year'.

5. RENOVATION OF TRADITIONAL WATER SOURCES:

Traditional water storage places have been able to meet the demand of drinking water in many regions but they have been renovated from time to time. Water stored in traditional water sources has been used for both purposes, agriculture as well as for drinking.

Important traditional water conservation methods for irrigation include Kuhul in hilly areas, Jing (Ladakh), Kool, Water Kundis called Khoop in Arunachal Pradesh, Zabo method of Nagaland, Aabi tanks of Haryana, Dong Pokhar of Assam, Bandhare of Maharashtra, Kere of Karnataka, Iree (Tanks) in Tamil Nadu, jackwell of Andaman Nicobar and Nadi, Tanka, Kund, Khadeen, Kui, Bedi, Baori, Jhalra, Toba etc. of Rajasthan.

These traditional water conservation methods had been developed in India looking to the nature of rainfall in different regions, but the increasing population necessitated extension of agriculture, leading to deterioration of these traditional sources. Conservation of any traditional water source, instead of being limited to the water reservoir portion, extends to the whole drainage area system where rain water is stored after flowing.

Due to increasing area of agriculture, drainage area of water has been destroyed resulting in reduction of water flow therein. This has caused crisis for the existence of traditional water sources. Water crisis can be prevented by renovating traditional water conservation sources. Unless complete conservation of rain water is done in any region, the dream of water conservation cannot be fulfilled. Hence, supervision has to be done regarding renovation of dying traditional water conservation places.

Now, the whole world has agreed with this fact that water available in its vast form also shall have to be conserved to keep it within our reach. From this point of view, ownership of traditional water sources should be at the village level as has also been agreed by the World Bank.

6. USE OF MODERN IRRIGATION METHODS:

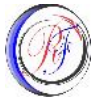
69 per cent water is used for the agricultural sector. Necessary requirement of water in agriculture is met by surface water sources and groundwater. Surface water used for agriculture is obtained through canals and tanks and underground water from wells and tube wells. Unfortunately, much water is wasted through traditional methods of irrigation. Canal irrigation does not distribute water in a balanced way and it creates problems of water logging.

A large portion of water can be conserved by adoption of modern methods of irrigation. Irrigation consumes double the quantity of water in comparison to all other uses. Sprinkler and drip irrigation methods save 50 per cent water.

In drip irrigation method, pipes with holes are spread over the surface of land so that the crop directly receives water. There is no loss due to evaporation in this system and almost 95 per cent water is utilized. Thus, maximum water is utilized by this method. Improved modern irrigation methods are thus useful for conservation of water.

7. INCREASING FOREST COVER:

As per to hydrological movements, water is received through rainfall every year in different quantities on the surface of the earth. This water flows on the surface and reaches the seas. Some part of rainwater is stored in stable water reservoirs (lakes and tanks), whereas some quantity of water infiltrates into the land and takes the form of groundwater.



Due to increasing deforestation during the last century, most of the rainwater flowed away to the saline seas without infiltrating into the ground. Water crisis also developed during the last decade in Cherapunji, which gets highest rainfall in the world, because forest cover has been destroyed there due to mining of limestone. As a result of it, rain water flows away very fast to the rivers. A similar thing is happening in the Dehradun area of Uttaranchal. Hence trees are helpful in reducing the demand for water along with recharging water sources.

8. CHANGE IN CROP PATTERN:

Excess water is not required if crops are grown according to agro-climatic conditions but in the present race of development, changing crop pattern with higher profits has replaced them. These commercial crops require more water than the traditional crops. In north-eastern part of Rajasthan, crops were not grown as per availability of water and intensive cultivation was adopted during the last three decades.

Groundwater was over exploited because of non-availability of surface water and plantation of commercial crops requiring more water. It created serious water crisis. Hence, keeping in mind the experience of Rajasthan, crop rotation should be adopted according to agro-climatic conditions. Agro forestry and horticulture should be given priority in areas having scarcity of water.

9. FLOOD MANAGEMENT:

A large portion of fresh water in the world becomes devastating due to floods in India, out of a total land area of 32.8 crore hectares, in India, 4 crore hectare land is flood affected, out of which 3.2 crore hectare land can be protected from floods. By construction of embankments and canals a large part of land can be conserved besides minimizing flood losses.

Intensive afforestation can also provide security from floods. It will be helpful in absorption of water in the soil. Drainage areas of Ganges, Yamuna, Mahanadi, Damodar, Kosi and other rivers have been taken up in flood management and security to some limit has been provided to the 1.44 crore hectare land.

10. USE OF GEOTHERMAL WATER:

Water is also received from hot waterfalls regularly at many places on earth. Scarcity of water can be met to a certain extent by using such geothermal water.

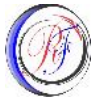
11. CONSERVING WATER IN INDUSTRIES:

Near about 23 per cent of total fresh water available on the earth is used by industries the world over. Some special industries consume water to a large extent, whereas some industries pollute the major portion of water. Dyeing industry and leather industry are such type of industries which pollute the water.

To manufacture one ton of steel, 300 tons of water is required. Consumption of water in industries is done in quantitative as well as qualitative forms. Proportionate consumption of water in industries in developed countries are more (50%), out of which 75 per cent demand is met from surface water sources and 25 per cent from groundwater sources.

12. REUSE OF URBAN WASTE:

Demand for water has increased in cities due to increasing urbanization. There is no provision for waste water treatment in many big towns and cities of various countries of the world. Instead of being reused, it pollutes other water sources. Such condition is visible in cities of Delhi, Agra and Mathura on the banks of river Yamuna, whereas in many countries, urban water is used after treatment in nearby fields for growing vegetables and fruits. After use of water in urban areas, disposed waste water can be treated and conserved for use in agriculture in the peripheral areas of cities. Such policies should be incorporated while planning urban development.



13. WATER CONSERVATION BY MUNICIPAL BODIES:

Municipal bodies should manage both individual demand and supply of water as well as conserve water. Municipal laws should provide for collection of rain water from roof tops and implement it. Individual awareness is very important in water conservation.

Every individual should develop the attitude of water conservation and prevent every drop of water from being wasted. As far as possible, one should conserve rain water along with maintaining quality of the water. Depth of traditional water sources should be maintained by controlling its cleanliness.

Environment balancing is the main basis of water conservation. Changes coming in the world environment result in shortage in the quantity of fresh water. Due to rise in temperature of the world, fresh water in the form of snow is melting and drifting towards saline oceans. Change in climate has also caused change in nature and quantity of rainfall, due to which existing unevenness in distribution of water has also increased.

CONCLUSION AND SUGGESTIONS

1. The development of modern water-saving agriculture is at a critical period with the traditional technology upgrading intertwined with the high-tech development.

2. At the same time, emphasis on the traditional technology application and upgrading depend on high-technology.

3. Great attention should be paid to the research and exploitation of modern water-saving technology, using information technology, biotechnology and other high-tech and new materials. Secondly, modern biology water-saving technology, an important direction for future water-saving agriculture development, is also a hotspot and emphasis for current research.

4. Water-saving irrigation technology, non-traditional water resources, exploitation technology, and dry-land water efficient technology are the keys to recent research of modern water-saving agriculture technology.

5. The main elements of its research should be focused to solving difficult problems of technology applications process, which is also an emphasis that we should strongly support and increase investment starting from now.

6. Technical system integration and demonstration is the key stage for technology into production application, but also a weak link of water-saving agricultural technology development in China.

7. To strengthen research and development of this work, it is conducive to transform technology and large-area applications; therefore it is also a current key research content that should be supported.

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