

Water Resource Management

Radhika.B¹, Sujatha.A²

Shrimathy Devkunvar Nanalal Bhatt Vaishnav College For Women, Chrompet, Chennai -600 044

No.2A, Muthumari Illam Thenmozhi Nagar, 3rd Street Extn. Keelkattalai, Chennai-117

Contact No.9940324685¹

Email.ID. radhi.balaraj@gmail.com¹

Abstract: Water is a natural resource which a fundamental basis and foundation for human survival and development. The earth does not exist without water. Water is needed for various usage like agricultural, industrial, fisheries, irrigation, recreational, domestic, and environmental and ecology activities. Water resource management refers to the utilization of each drop of water for production. Increase in population needs more production of food grains which in turn needs more water. There should be the demand and supply equalized, rather only demand increases due to increase in population will lead to increase in employment need industrialization, recreation is also becoming necessary for mechanical life of human it also requires water for all these requirement water resource management is inevitably invited. In India most of the states suffering from water scarcity. This paper makes an attempt to study the water scarcity problems, issues emerging and challenges for better management of water source and measures to be adopted for preserving and supplying of water for domestic and irrigation needs.

1. INTRODUCTION

In the national development planning for the 21st century water is the most crucial element. During the period of independence the country was facing two challenges one is enhancing food grain production and facilitating clean drinking water. In the five year plans, major investment priority was given for irrigation development. Since 1951 India has made remarkable achievement in irrigation development. (Bharadwaj 1990; Varghese 1990; Vohra 1995). Substantial achievements had also been made in water supplies through the development of surface and ground water resources. At the time of independence, only 6.5% of the population had safe drinking water supplies. (Source: Five-year plans as quoted in TERI 1998), by the year 1997, about 81 percent of the total population has access to safe drinking water supplies. (CSE 1997). However the development had also brought several physical, social and economic problems.

2. RIVERS PLAYS A MAJOR ROLE IN HUMAN SURVIVAL AND DEVELOPMENT

The boundaries of the entire world land area lie in the river basin. The major functions of river's basin are listed

- a. Irrigation usage.
- b. Industrial usage.
- c. Domestic needs.
- d. Tourism and entertainment.
- e. Environment and ecology system.

3. THE MAIN OBJECTIVE OF THE STUDY

- To find out the causes relating to water scarcity
- To determine the maintenance of existing water resource structures
- To reuse and recycle of waste water
- To find the measures to be taken for better water resource management.

4. CAUSES RELATING TO WATER SCARCITY

4.1 Growing demand:

A variety of demographic and socio-economic trends such as population growth, urbanization, industrialization, change in agricultural practices and cultural changes in combination have triggered off this explosion in demand for water.

4.2 Waste water discharge in rivers.

Most of the industries dispose of their treated, untreated or partially treated water in the natural rivers and streams causing severe pollution, which drastically reduces the effective availability of freshwater. Nearly 80% of untreated water is discharged down to the streams of the rivers. The setting of treatment of plant is compulsory for any industry but due to unethical, social and political reasons, the untreated water is discharged to the river. The polluted water will cause a number of diseases for all human livings, animals and fisheries.

4.3 Tourism and Ecology system.

Development of tourism has been increasing all over the world as well as in India. The

government has taken various steps to develop the bird sanctuary, zoo, national park etc. for the entertainment and recreation purpose for the people. It will be increasing the number of foreign tourists and from foreign income, the growth rate of economic development goes at a higher rate. But it has a negative impact that the environment and ecology system gets polluted, the people arriving at these places gives birth to roads by cutting so many trees it has formed into a place for the human living also. Development in tourism created conflicts between the animals and human, human cleverly utilized the places nearby the forest area and said that the elephants had entered the village.

4.4 Domestic Problems.

Urban people consume more water for household and adapting to western lifestyle. Some years back if we entered the hotel, food and dishes will be served in a single plate, but today because of the western culture influence the hotels serve each dish in a separate plate. This will increase the water need. In the weddings functions, office seminars, conferences and in all social events water is served in 200 ml, 500 ml, bottles most of the time the people will not consume the full bottle of water, it will result in wastage of treated water.

4.5 Rural to urban migration:

As agriculture became more challenge with the lack of water resource and improper distribution system. In recent years the farmers started leaving their lands and in many villages, farmers committed suicides also. Due to the cost involved in agriculture does not meet the O & M expenditure most the people sold out the farming lands. The report has drawn a baseline of 15,000 farmer suicides every year since 2001. The farming lands became plots, the soil lost habitats character. People started migrating from rural to the urban area for their survival.

5. MAINTENANCE OF EXISTING WATER STRUCTURES

Preservation of the limited water resource which is available plays a major task in water resource management. Due to the global warming effect and linguistic issues construction of new dams and reservoir are made very difficult. Rivers, ponds, streams, lakes and reservoir, dams and groundwater aquifer are essential for the ecosystem of the earth's landscape. They not only serve as water storage and flow of water, but they also differ

in their habitats i.e.; the natural environment in which an animal or plant usually lives.

5.1 Maintenance of the dams.

Proper maintenance of the dam, the pipelines, which supplies water for irrigation and industries should be checked for quality. The traditional water storage structures like good old Lakes and Tanks, Dams and Reservoirs are to be protected and maintained well for storage. Similarly the distribution network system like canals, tunnels, syphon, drop and sluices are to be maintained for better distribution of water without seepage and wastage.

5.2 Retrieving of lakes and water source.

The ancient people used a chain of tanks which has the function of recycling of water. From the anicuts, water is diverted to the first tank then the surplus water from the first tank goes to the other tank, then the surplus water transferred and recycled to the river. Agriculture is affected due to lack of water supply at the appropriate time. The main reason that there is a change in climatic conditions we are not getting the periodical monsoon rainfalls. Balancing consumption with supply is a core challenge for effective water resource management around the world. Lakes have remained without water for more years are started exploited. Development of urbanization required more lands. The system of water storing in ponds, streams, lakes is started destroying. Lakes, streams, ponds should be retrieved and preserved by the water governing bodies and the local municipalities state and central governments.

5.3 Minimization of the usage of water by regulations.

Earlier there was well water which served the need and purpose of people then and there. People use to store the water and used for their utilities. Development in building construction and infrastructure the number of water spouts increased. (Water taps), which made people use water liberally and kids started wasting the water unknowingly the importance of water. Wastage of water can be minimized by government regulations and local municipalities.

6. REUSE AND RECYCLE OF WATER

The industries discharge untreated water down to the streams and rivers. The setting treatment of plant is compulsory for any industry. But most of the industries are not setting treatment of plant. Though the state government gives 25% subsidy, central government gives 25% of

subsidy and the remaining 50 % is borne by the industry the one litre treated water is not used for irrigation because of high TDS.(Total dissolved solids). Crores of fund became wasted. Wherever possible two different pipelines to be used one for sewage and one for kitchen and bath water so as to reduce treatment cost and able to recycle the water.

7. MEASURES SHOULD BE TAKEN FOR BETTER WATER RESOURCE MANAGEMENT

7.1 Protection of the forest:

The origin of rivers is mostly from the hilly region and forest. Once the forest is wealthy and healthy it facilitates the good flow of water to the rivers and its basins. The wealth of the forest lies on the wild animals and density of the forest. The animals need food and water to be preserved.

7.2 Rainwater harvesting:

Rainwater harvesting, a simple technology which is used for collecting and storing rainwater from the rooftople like jars and pots and complex technique such as groundwater check dams. Rainwater harvesting is the accumulation and deposition of rainwater for reuse instead allowing it to run off. Rainwater can be used for irrigation and domestic purpose, like gardening, livestock, drinking purpose and recharge underground water.

7.3 Integrated water resource development – Agriculture sector

In agriculture, we can adopt the sprinkler system and drip systems as water conservative apparatus. Implementing these systems will cost more but the government has given a portion grant and subsidy. Water could be conserved more by adopting diversity crop concepts and organic farming which helps the farmers for less water, less input with a reasonable profit. In organic farming soil erosion can be reduced, hundred percentage of organic farming makes the soil naturally soft and during rains, it allows more water percolation to land and ground.

7.4 Groundwater management:

The right to groundwater should be to the concerned community and not to an individual on the basis of land-ownership. In the places where water scarcity, the respective community organization should have the right to inspect and monitor the use of groundwater by private landowners to ensure that beyond permissible limits is not being withdrawn.

7.5 Flood management and drainage system.

We should understand that the floods can be managed only, they cannot be controlled. It is a natural disaster the monsoon rainfalls takes place in a couple of days or in weeks continuously which is more than the entire periodical seasonal rainfall for that year. People should begin to learn to live in with floods in ways that are least disruptive and harmful to them. Draining out of water becomes necessary to get rid of bad quality water from sewage and industrially used water, it can be avoided by treating the water and reusing it. Land area can be recovered from waterlogged and salinity and made fit for various uses applying proper drainage system.

7.6 Steps to be taken in the industrial sector for water resource management.

By implementing effective ETP / CETP in all industries, the untreated water can be efficiently reused. Violation of laws should be legally punished. Employees should be educated and enthused to adopt a clean production process. All the industries placed on the river banks should be regulated by concern water regulation bodies. As the industries are polluting the natural environment, directly and indirectly, they should hold some social responsibility. They must participate in the social welfare of the society by adopting a village, by planting more trees wherever possible.

7.7 Quality of water:

Quality of water determines the suitability of the water for a particular purpose. The quality and quantity issues of water are interlinked.

7.8 Steps to be adopted in the domestic sector for better water resource management:

Necessary steps to be taken for the supply of protected water to all people. Try to reduce the wastages through pipe leaks. Public should be encouraged for the economic utilization of water. Motivate the educational institute for reuse and recycle of water. People are advised to use the treated water only for drinking purpose and not for the other purpose like gardening, bathing etc. People should participate themselves to support and follow the economic action plan. Plastics usage should be minimized and stopped. We should celebrate our festivals with eco-friendly manner, i.e. By burning green crackers. Motivate every citizen to plant tree saplings as a festival. Local municipalities shall implement STP and municipal solid waste management programme.

8. GOVERNMENT MEASURES IN WATER RESOURCE MANAGEMENT

The Government has taken that though water is a State subject, the protection, regulation and management of the activities relating to water resources are undertaken by the respective States, with a view to encouraging and assisting the State Governments in this effort, Government of India has undertaken the following protection and regulatory measures:

A Water Quality Assessment Authority (WQAA) has been established under the Environmental Protection Act. A draft Model Bill to regulate and control the development and management of groundwater has been circulated to the States and Union Territories. The Central Ground Water Authority has been constituted under the Environmental Protection Act 2005. National River Conservation Programme is also being implemented by the government of India for conservation and management of polluted rivers.

9. FINDINGS AND CONCLUSION

The water from agricultural lands has no single point of pollution when it is done with a focus on bio-fertilizer, bio-pesticides and organic farming. By encouraging organic farming the pollution of water can be reduced to a great extent.

Promoting inland fishing in the lakes, ponds, and using the treated waste water.

Promoting eco-friendly tourism by protecting the forest against deforestation and saving and increasing the wildlife population.

Adopting vegetative measures instead of engineering measures in the catchment area.

Many of the irrigation projects are under construction, by facilitating the required fund for their completion in the nearby years should be prioritized.

Active participation from the private and public sectors in the water resource management programme should be welcomed with proper limitations.

Focus on Research and development, for effective and economical management of our water resources, the frontiers knowledge need to be pushed forward. Inter-linking of rivers with least environmental damage.

People use liberal water for all their purposes when it is available economical. Water service charges should be increased gradually to cover the O & M (operation and maintenance cost) expenditure both in irrigation and domestic water supply. The above-mentioned action programme can be implemented for a short

term basis, depending upon the results obtained it can be enhanced to long term. The water resource management programme reduces the scarcity of water. The success rate of water resource management lies in the hands of local municipalities, state and central governments, the water regulation bodies and the public. Social responsibility of every citizen will promote the water resource management and flora and fauna species will be flourished.

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