

Water Conservation And Waste Water Management In India

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ABSTRACT

Considering the scarcity of potable water with respect to the ever increasing population of India, conservation of water resources is very essential in India. The availability of fresh and potable water in India is very poor as compared to the rest of the world. Increasing level of water pollution is a matter of concern for India. The issue of water pollution in India is so serious that it is very important that a number of precautionary measures must be taken to prevent and control the pollutants into aquatic ecosystems. Treatment of out flowing wastewater should be made compulsory for all organizations and companies that let the hazardous and chemical discharge into the surface water resources that are used further by living beings. Inputs of pollutants such as phosphorus, nitrogen, chromium etc. and pesticides and insecticides from agricultural activities to water bodies should be checked in all possible manners. On the other hand, constructive usage of wastewater is vital for control of water pollution. Hence, conservation of fresh water resources and management and constructive usage of wastewater is the need of the hour in order to fight a tough battle for saving the environment. The present study deals with the ways of water resources conservation and affirmative methods of wastewater management to preserve the sustainability of our valuable environment.

Key- words- Wastewater, hazardous discharge, carcinogens, environmental issues.

INTRODUCTION

It is a well known fact that water is the source and controller of life on earth. Life emerged on earth due to the presence of water and water is present in all kinds of animals and plants in some quantity or other. A loss of just 10-20% of water in the body can lead a living being to death. Earth is the only planet of solar system where water is found in all its three states-solid, liquid and gas. Life has been possible to survive on earth due to this unique property of water. Bodies of more than 99.99% organisms contain water compulsorily. As we all know, more than 71% of earth's surface is covered by water. This is the reason that earth is known as blue planet.

97.3% of total water available on earth is found as oceanic water which is not potable because of being salty. Only 2.7% of water available on earth is clean and potable. Out of this 2.7% water, about 2% water is frozen on either north or south poles in the

form of ice. Remaining 0.7% potable or clean water is found in rivers, ponds and lakes. Making 0.7% of water available on earth for consumption and domestic use to 70 billion people is a gigantic task for most of the governments, environmentalists, sociologists, various organizations and scientists. This is why the third world war if it would ever be fought, is predicted to have water as its main reason. Whole world including India is facing global warming and over population, the water resources available for the world population are shrinking day by day and menace of water scarcity has already appeared before us. A number of rivers flowing from one country to another are causing serious threats to international relations and the countries affected by these rivers are racing towards constructing huge dams for making more and more water available for their countrymen. Verbal clashes between India and Pakistan, and construction of a dam on Bramhaputra

by China are examples of such conflicts. Demands of reviewing of the agreement made in 1960 between India and Pakistan are arising. The spars between Indian states of Tamil Nadu and Karnataka over the water of Kaveri River and that between Andhra Pradesh and Karnataka over Krishna River have been several decades old now. Apt management of water and making food and clean drinking water available to its huge population is a mammoth task for developing India because 17.5% of world population resides in India which owns only 2.42% of land and 4% water resources available on earth. Without water, neither the dream of developed nor clean and healthy India is possible. The giganticity of the water crisis can be understood by the fact that more than 11 billion people worldwide are facing a permanent scarcity of potable water and more than 27 billion people worldwide have to face scarcity of potable water at least for one month every year. This means that about 50% of people worldwide are already facing water crisis. The status of water availability in India either is not good. About 3.3 billion people from nine states of India faced severe water crisis in 2016. According to Central Water Commission, a reduction of water level in about 275 rivers across India is the indication of a severe water crisis in near future. In about 91 important water bodies, availability of water is reduced to a mere 20-22% in every summer season in India. Similarly, the drying of small rivers and lakes in northern plains of India every summer is also a matter of great concern. The immensity of water crisis can be understood by the fact that from Mehsana in Gujrat to Bhubaneswar in Odisha, from Delhi in north to Bengaluru in south, Latur in Maharashtra to Bundelkhand in Uttar Pradesh, Coimbatore in Tamil Nadu to extremely hot places such as Bikaner and Jodhpur in Rajasthan, extreme scarcity of water and drought throughout summers in all these areas is very common. Hence, proper management of water and its resources is very vital in reference to India. The present study is an effort to provide some solutions for this problem.

1) Conservation of traditional water resources

Ponds and wells, water tanks, natural and man

made lakes have been used for irrigation and consumption purposes in India since ancient times. In southern and western parts of India, where the land is rocky and ponds were the only sources of water for irrigation and drinking purposes. This water was used for various purposes throughout the year. However, the way we have ignored the importance of such ponds and lakes is distressing and known to all. Urbanization has gobbled up thousands and lakhs of lakes and ponds and those who can still be recognized, are now being used as a garbage dumping ground. More than 1 million wells in India are now dried up due to ignorance and carelessness, but which can still be used again if we take a little care of them. Similarly, old ponds can be cleaned and used as a source of potable water if we could prevent them from being contaminated and stop sewage water and dirty matter going towards these ponds and lakes. By doing so, the old ponds and lakes can be rejuvenated and the problem of scarcity of water and crisis of drought can be tackled in an effective manner.

In rural as well as in urban areas, ponds and lakes can be surrounded by plantation where ornamental plants can be planted with tree guards, and such places can be developed as nice and beautiful picnic spots.

2) Rain Water Conservation

Nature has gifted India with a lot of rainfall. About 80-90% of land area in India receives normal or average rainfall. India receives about 4 trillion cubic meters of rain water every year. However, only 15% of this is conserved and used for human consumption and usage. A big step is needed today in this direction because water crisis in urban areas and the problem of drying wells, ponds and lakes can be solved to a great extent through conservation of rain water. According to an estimate, conserving 30-35% of total rainfall received annually can help India get rid of drought for a large part of land and the problem of drinking water and irrigation purposes.

Urbanization in India has lead to the the roads, footpaths and drains getting concretized day by day which in result has reduced the capacity of land to

absorb the rain water. The rain water flowing through the drains, sewers and rivers reaches the sea and the land remains thirsty. Similarly, a very large amount of rain water in cities flows to drains and sewers to rivulets and to the rivers and finally in seas and the land is unable to receive the water and absorb it. This has resulted in the lowering of water level in cities every year by several feet or meters which again is a very big problem because the deeper the level of underground, more difficult is it to fetch it out. This problem can be solved to a great extent by either sending the rain water falling on the roofs to underground through a pipe or collecting it in water tanks made for this purpose and using it for human use. Vacant places in public parks, fields in schools and colleges, big offices and institutions can be used for making water tanks which can help maintaining underground water level and this could be an easy solution of shortage of water. In several places in states like Rajasthan, Chhattisgarh, Madhya Pradesh etc., good results have been achieved towards this and rain water is being used for human use and maintaining the underground water level and this has helped fight the scarcity of water in a fine manner.

Similarly, check dams can be constructed in dried up canals and rivers to collect rain water. This method has increased the availability of water for farming and cattle rearing purposes in comparatively drier states of India such as Rajasthan, Gujrat, Madhya Pradesh, Chhattisgarh etc.

3) Stopping overuse of water in agricultural purposes

About 65-70% of water in India is used for agricultural purposes. India is a country where underground water is being exploited the most. Similarly, largest amount of water in India in the world is used for irrigation which is a matter of pride for India. About 27% of rice and 15% of total wheat produced in the world comes from India, but this fact should also be kept in mind that about 1000 litres of water is used to grow about 1 kg of wheat, and about 4000 litres of water is used to grow about 1 kg of rice.

Significance of water can be understood by the fact that Japan instead of growing rice, imports rice from other countries to save water for future rather than using it for growing agricultural products that use huge amounts of water.

Overuse of water in agriculture is very important, because unlike industrial usage, the water used in agriculture is not available for us as wastewater to treat and recycle it and make it available again for any other purpose. Hence, farming methods that use lesser amounts of water should be adapted. Israel and Australia have worked successfully in developing agricultural methods that use far lesser amounts of water than in conventional methods. Dripping, showering, warehouse and shade techniques are some of the methods available today that can be used to grow agricultural products using lesser amounts of water which can help us save and conserve water for our future.

4) Promoting afforestation

This is a well established fact that forests attract moisture present in atmosphere and thus help in amplification of rainfall. Forests also help in temperature control and maintaining the underground water level along with enhancement of rain. Afforestation can prevent desertification of land. Afforestation has been successfully implied in Rajasthan to stop desertification at a number of places. Similarly, water level of rivers, ponds and lakes has seen increased if afforestation and plantation have been carried out near them. Waterman Rajendra Singh has successfully increased the water level of a number of rivers in Rajasthan by plantation and afforestation near dried rivers and lakes.

RECYCLING AND REUSE OF WASTEWATER

Water can be recycled by various systems that could provide a clean and safe resource. The quality of once used water and the specific type of reuse (or reuse objective) define the levels of subsequent treatment needed, as well as the associated treatment costs. Some important reuses of wastewater can be described as below:-

AGRICULTURE AND AQUACULTURE

On a worldwide basis wastewater is the most widely used low-quality water, particularly for agriculture and aquaculture. Further, we focus on this type of reuse because of the large volumes used, the associated health risks and the environmental concerns. Other types of reuse are only discussed briefly in the following sub-sections. India is the largest user of water for irrigation purposes in the world. Most of the water used in India for irrigation purposes doesn't come from wastewater. This needs to be pondered over.

REUSE OF WATER IN URBAN AREAS

In metropolitan cities, huge quantities of water is wasted on activities such as washing utensils and clothes, bathing, gardening, sprinkling in parks etc. Washing of lawns, roads and vehicles are some other activities where a lot of water is wasted. In urban areas, reclaimed wastewater has been used mainly for non-potable applications such as irrigation of public parks, recreation centers, athletic fields, school yards and playing fields, landscaped area surrounding public, residential commercial and industrial buildings, golf courses, reflecting pools and waterfalls, fountains, toilet and urinal flushing in commercial and industrial buildings, fire protection etc.

Potable urban reuse can be performed directly or indirectly. Indirect potable reuse involves allowing the reclaimed water to be retained and diluted in surface or ground water before it is collected and treated for human consumption. In many developing countries unplanned, indirect potable reuse is performed on a large scale, when cities are supplied from sources receiving substantial volumes of wastewater.

Direct potable reuse takes place when the effluent from a wastewater reclamation plant is connected to a drinking water distribution network. Treatment costs are very high because the water has to meet very stringent regulations which tend to be increasingly restrictive both in terms of the number of variables to be monitored as well as in terms of

tolerable contaminant limits.

REUSE OF WATER IN INDUSTRY

Some common uses of reclaimed water in Indian industries are evaporative cooling water particularly for power stations, boiler-feed water, process water, irrigation of grounds surrounding the industrial plants.

Usage of reclaimed wastewater by industry is a potentially large market in developed, developing and rapidly industrializing countries. Industrial reuse is highly cost-effective for industries where the process does not require the water of potable quality and where industries are located near urban centers where secondary effluent is available for reuse.

MAKING LAW FOR WATER CONSERVATION

Several countries in the world have made laws for water conservation and these laws have been very much fruitful. Israel, Australia, England etc. have created strict laws regarding the usage of water. This has helped a lot in preventing the wastage of water. It is also essential for India to make such strict laws and imply them for conservation of water and stopping its misuse along with preventing the sources of water from being polluted. The business of packaged drinking water has crossed about `1 billion. As a result, millions of plastic bottles and pouches are creating heaps of garbage that is becoming a vital cause of pollution and damage to the environment. Similarly, the business of R.O. (Reverse Osmosis) water is escalating at exponential pace. In the process of reverse osmosis, more than 10 times of water is wasted than the water purified. Nobody is concerned over this problem. There is no law about the wastage of water in India. Though strong need of laws for preventing the over exploitation and wastage of water is being felt, the process of making a law regarding this is pending for a final draft since 2010. Similarly, there is no law that could prevent the over usage or over exploitation of water through submersible pumps, which should be a matter of great concern. n Jharkhand, India.

Conclusion

The rigorousness of water crisis in India can be understood by the fact that the availability of water per person in India in 1951 was 5177 cubic meters per annum which is supposed to shrink to 1341 m³ in 2025 and 1000 m³ in 2050. The negligence regarding water at government level as well as common man's level becomes apparent as we come to know that in Cherapunji, which is considered to receive highest annual rainfall in the world also faces lack of potable water once the rainy season is over because the rain water flows down the mountains without being preserved. In the year 2017, the water crisis in Latur (Maharashtra) and Bundelkhand area was a reason of everybody's attention when water was supplied there by tankers of a goods train. However, no concern is being shown at administrative or at public level. Water level has gone perilously low in 700 blocks in India. In Mehsana in Gujrat and Coimbatore in Tamil Nadu the level of water has went down up to 700 feet. Tourists have stopped visiting Capetown, one of the most beautiful cities of the world due to water crisis. In most of the areas in India, over exploitation and negligence towards the water crisis has become so precarious that supply of water to everyone for daily use is not possible. In several areas, only 25 liters of water per head is being supplied by the administration every day. Activities such as washing and bathing have come to a halt. In some places, the government has to deploy heavy armed forces in the public to stop riots that could occur due to lack of water. A number of cities in India are going to become Cape towns in near future. Therefore, on one side, a lot of work has to be done in the field of water conservation and it's wisely usage, on the other side, strict measures have to be taken for misuse and wastage of water. Otherwise, all of us will have to face serious water crisis in very near future. The responsibility of conserving water cannot be left on the hands of administration and government organizations only, public awareness and the responsibility of general people is also very

vital for this purpose.

REFERENCES

- Agnihotri, Nikhil 2017. Development Of Water Management In India. In Climate And Environmental Changes: Impact, Challenges And Solutions. Eds. Dixit Y.C. And Trivedi Himanshu, Invincible Publishers, Gurgaon, 978-93-86148-89-6 pp.139-145.
- Arthur, J.P. 1983. Notes on the Design and Operation of Waste Stabilization Ponds in Warm Climates of Developing Countries. Technical Paper No. 7, World Bank, Washington DC.
- Bartone, C.R. 1985. Reuse Of Wastewater At The San Juan de Miraflores Stabilization Ponds: Public Health, Environmental And Socio-Economic Implications. PAHO Bulletin, 19(2), 147-164.
- Bartone, C.R. 1991. International Perspective On Water Resources Management And Wastewater Use—Appropriate Technologies Wat. Sci. Tech. 23, 2039-2047.
- Bartone, C.R. and Arlosoroff, S. 1987. Irrigation Reuse Of Pond Effluents In Developing Countries, Wat. Sci. Tech. 19(12), 289-297.
- Bartone, C., Moscoso, J., Nava, H., 1990. Reuse Of Waste Stabilization Effluents For Fishculture: Productivity And Sanitary Quality Results. In: Charles R. O'Melia [Ed.] Environmental Engineering. Proceedings Of The 1990 Specialty Conference. Arlington, Virginia, 8-11 July 1990, American Society Of Civil Engineers, New York, 673-680.
- Clarke R. 1993. Water: The International Crisis. Boston, MA: The MIT Press, ISBN 026253116X, pp.193.
- Clark J. W., Viessman Jr. W., and Hammer M. J. (1977). Water Supply And Pollution Control. New York: Harper And Row Publishers. ISBN 0-7002-2495-5, pp. 857.
- Mori, A. 1993. Treatment And Recycling Of Sewage

Sludge In Yokohama, Proceedings Of The 15th Federal Convention Of Australian Water And Wastewater Association, 18-23 April, pp. 682-688.

National Research Council (1994). Groundwater Recharge Using Waters Of Impaired Quality. National Academy Press: Washington DC, pp. 283.