

Water—Threat of the Century

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ABSTRACT

Population growth, climate change, and mismanagement of water resources and unnecessary waste of water threatens the sources of potable water. Agriculture and energy resources also faced problem due to water scarcity. Global warming can cause a severe condition by 2100. In spite of using the ground water in agricultural sector the waste water can be used, keeping in mind the proper disinfection and pollution criteria. With increase of population, global food production requirement is going to be double over the next 40 years to meet the needs. And we cannot increase the usage of river and ground water.

Key Words: Water, Recycle, Environment, Global warming

INTRODUCTION

The essential element water is threatened in the present Century. During the formation of earth the water is the element where the unicellular organism grows and from there diversified animal and plant kingdom arises. But present scenario there is water but the drinking water source has become limited. Even we have to reuse and recycle the water in several places. Mankind is now focusing on water management, rain water harvesting, recycle of waste water, and also trying for artificial rain¹ in the draught areas. The present article will focus only on few aspects of water problems and the management.

WATER --- THE THREAT

Water is the most essential need for personal health, healthy economic, geopolitical, and environmental conditions. Many western and some eastern regions are still experiencing drought or its residual impacts, such as reduced water supplies and lower water quality. For direct human use less than 1% of the world's fresh water (or about 0.007% of all water on earth) is accessible. The population growth has been identified as the largest single cause of the water crisis (Jones 1999). Due to population growth, climate change, and mismanagement, the need for adequate, affordable drinking (and irrigation) water is a growing international crisis. According to the UN report by 2025, forty-eight nations, with a total population of 2.8 billion, will face freshwater "stress" or "scarcity".

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Water resources are under threat in many parts of the world. Climate change and natural disasters like earthquakes are aggravating already critical situations. But a significant number of threats are posed directly by human interference and failings (Schiermeier 2014).

Vörösmarty et al. (2010) found that nearly 80% of the world's population is exposed to high threat to water scarcity. Massive empowerment with financial support on water technology enables rich nations to offset high stressor levels without remedying their underlying causes, whereas less wealthy nations remain vulnerable. Lack of precautionary investment jeopardizes biodiversity, with habitats associated with 65% of continental discharge classified as moderately to highly threatened.

In spite of several attempts by International community from G8 summits² to the World Water Forum aimed at improving water supply and sanitation around the world. According to Jones(2000) 2/3rd of the world population are likely to suffer water stress by 2025.

Waste of water has been notified by Jones (2009) in irrigated agriculture or with ageing and poorly maintained infrastructure. Over 3/4th of water supplies worldwide are used by agriculture and traditional flood irrigation can waste 60-70% of this. Some of the largest per capita consumptions of water lie in the Middle East where 95% is being used in agriculture, mostly very inefficiently and well excess of requirements.

The most vulnerable areas are the semi-arid regions on the desert margins, where water management is complicated by three natural problems: low average precipitation, high seasonality of rain fall and high inter annual variability.

Schellnhuber, Director of the Potsdam Institute for Climate Impact Research, Germany, and other leading climate-impact researchers launched the Inter-Sectoral Impact Model Intercomparison Project which suggests that even modest climate change might drastically affect the living conditions of billions of people, whether through water scarcity, crop shortages or extremes of weather. The group highlighted that water is the greatest challenge and a matter to think crucially. If the world warms by just 2 °C above the present level, which now seems all but unavoidable by 2100, up to one-fifth of the global population could suffer severe shortages.

Our environment is facing a water crisis in public health: More than a billion people in developing nations lack access to safe drinking water, and more than 2 billion lack proper sanitation (Bartram J 2008). Water shortages are expected to spread into other key sectors — notably agriculture (Marris E 2008) and energy (Hightower & Pierce 2008).

Water research and policy have focused mostly on the 'blue water' in rivers, lakes, reservoirs and underground aquifers. But blue water accounts for only 40% of the world's freshwater balance, and for much less in dry regions. The key to tackling the crisis in the most food-insecure parts of the world is managing 'green water'³: the less spectacular, but more abundant moisture that infiltrates the soil from rainfall, and that can be taken up by the roots of plants.

So far, two countries doing the best in that regard Israel, where severely limited water supplies have led to a national system in which nearly every drop is recycled; and the Netherlands, where an overabundance of water encroaching from both sea and sky has led to a national strategy to control every aspect of the resource (Nature editorial 2008).⁴

Tom Clarke (2003) searches the hope of relief on living on the flood plain of three great rivers: the Brahmaputra, the Meghna and the mighty Ganges. The people of Bangladesh endure floods, drought, water-borne disease and much else besides.

HOW CAN WE CHANGE THE WAY WE USE AND MANAGE WATER ?

The water-management institutions and governance models for many nations were developed when water was plentiful. Developing countries, such as India, have traditionally used surface-irrigation systems, which use gravity to distribute water over the soil surface. But these systems are no longer adequate, and farmers are now using up groundwater supplies to irrigate their land. Governments are not regulating groundwater extraction properly, and the water levels in many regions are declining. Governments need to introduce policies that allocate water to agriculture and industry, and that will enable them to reduce those allocations when supplies become scarce or demand from other sectors increases.

Water recycling is reusing treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing a ground water basin (referred to as ground water recharge). Recycling of water provides resource and financial savings. Wastewater treatment can be

tailored to meet the water quality requirements of a planned reuse. Recycled water for irrigation requires less treatment than for drinking water. Gray water,⁵ is the reusable wastewater from residential, commercial and industrial bathroom sinks, bath tub shower drains, and clothes washing equipment drains. Gray water is reused onsite, typically for landscape irrigation. A wastewater treatment task group on onsite residential and commercial gray water treatment systems has been established by National Science Foundation (NSF)⁶ International. NSF planed a draft new standard – NSF 350 – Onsite Residential and Commercial Reuse Treatment Systems. NSF 350 covers residential wastewater treatment systems (similar to the scope of VSF/ ANSI Standards 40 and 245) along with systems that treat only the gray water portion.

Water recycling opens the avenue of environmental benefits. Recycled water helps us to find ways to decrease the diversion of water from sensitive ecosystems. Other beneficial effects are decreasing wastewater discharges with reduction in pollution. Recycled water can also be used to create wetlands and riparian habitats.

The stakeholder input process identified a number of themes to update or emphasize in the updated guidelines, including:

- The role of reuse in integrated water resources management
- Energy use and sustainability associated with water reuse
- Agricultural reuse
- Wetlands polishing and stream augmentation
- Expanding opportunities for industrial reuse 2012 Guidelines for Water Reuse⁷
- Groundwater augmentation and managed aquifer recharge
- Individual on-site and gray water reuse systems
- New information on direct and indirect potable reuse practices
- International trends in water reuse

Agricultural sector is the largest user of fresh water, making up 70-90% of the annual water demand for many countries. This needs to be changed, because global requirement for food production is going to be double over the next 40 years to meet the needs of the growing population. Farmers should increase production with limited use of water than they do today. If all the water in a river is used by agriculture and industry, leaving nothing for the aquatic environment, fish and plants will not be able to survive, and the river will die.

CONCLUSION

Potable water sources become limited after any disaster at any place of the world. Human have to save drinking water at any cost. For bathing and cleaning, non-potable water can be used. Bacteria free or even filtered water sources are limited at many parts of the world. We have to secure our future water resources by utilizing the waste water, using less amount of ground and river water. And we should implement water management in every aspects to save our future. New avenues of different water sources such as water from moisture of air is also to be counted very critical. The search for water sources and implementation of different technologies may bring a solution in near future.

Endnotes :

1. Artificial rain is a form of weather modification, to change the amount or type of precipitation that falls from clouds
2. G8 stands for Group of Eight and is made up of leaders from Canada, France, Germany, Italy, Japan, Russia, the UK and the United States of America.
3. The green water refers to water stored in soil (rainwater stored in the soil as soil moisture).
4. Editorial(2008)Nature 452, 253 | doi:10.1038/452253a
5. The gray water is polluted water
6. The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense
7. Water Recycling and Reuse: The Environmental Benefits, United States Environmental Protection Agency, Water Division Region IX - EPA 909-F-98-001.

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