

Thirsty Planet Confronting Water Scarcity in the Path Forward

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ABSTRACT

The most recent global water development reports (UN-Water, 2009) note the connections between and effects on water of the several worldwide crises lately documented, including those relating to energy, food security, climate change, economic slump, and financial turmoil. A major challenge to our global economy, culture, and even human life is water scarcity. The primary cause of the current situation is water contamination, particularly in the agricultural sector. Pollution may originate from several sources such as oil, chemicals, corpses, or fecal matter, but it mostly impacts the world's population. The bulk of people cannot afford the rising cost of water as the globe moves in that direction. India is home to many bodies of water, however this is a result of poor management and unscientific industrial growth. We are seeing an upsurge in river mortality. Plans for development that are not sustainable indicate that our future generation is not in grave danger; on the other hand, plans for development that are sustainable indicate that our future generation is not in grave danger. The grassroots must drive the transformation in addition to governmental measures. Water consumption and future savings are the topics of this study. It also draws attention to the issues that next generations will face, as well as the significance and hazards associated with water shortage.

Keywords: Water shortage, Pollution, Global Population, Food Security, Sustainability

Introduction

Since humans, animals, plants, and other living things cannot survive without water, water is essential to life. Water is required for industrial production, animal feeding, food security, environmental preservation, and biodiversity. The only supply of water that is suitable for all uses—drinking, industrial, agricultural, and other—is fresh water. India is not a water-poor nation, but it is becoming such because of the country's expanding population, serious misuse, and overuse of this resource. Although this is becoming a global problem, India is particularly at risk due to rising demand and an unruly lifestyle. In order to guarantee a higher standard of living, this demands that the stakeholders take prompt action to use the water resources sustainably. A third of the world's developing population will experience acute water scarcity by 2025 (Seckler et al. 1998). However, a significant volume of water flows out to sea each year even in many areas with limited water resources. But sometimes, the floodwater is not used to its full potential, and the floods themselves may be quite harmful. Over two billion people on the planet live in areas where there is a shortage of water, with India experiencing an especially severe situation. There are already millions of Indians without access to safe drinking water, and things are only getting worse. The pace at which India's

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need for water is increasing is concerning. With its projected population of 1.6 billion by 2050, India is predicted to surpass China as the country with the second-largest population in the world. This would put an increasing burden on water supplies. A sustainable approach to water resource management in every sector is crucial, as the balance between water availability and demand has reached critical levels in many countries worldwide, and as the biggest challenge going forward is increased demand for water and production in every sector. In this case, the article's main goal is to provide a broad overview of the reasons of water shortage, how it affects global civilization, and what steps may be taken to address the issue. These topics are well covered.

Types and Scarcity of Water

"We refer to a person as water insecure when they do not have access to safe and affordable water to meet their needs for drinking, washing, or their livelihoods." Therefore, we may refer to a place as water scarce when a significant portion of the population lives there without access to water for an extended length of time (R&Sberman 2006:6). Water shortage was classified into two categories: economic and physical (project water). Physical scarcity indicates that the issue of water shortage in certain areas is more serious. Physical access to water is restricted when demand exceeds the capacity of the land to provide the necessary water, and this is the case in arid regions or the dry parts of the globe (UNDP 2006). Since the problem is mostly due to a lack of thought and effective administration, economic scarcity is by far the most concerning kind of water shortage. Unequal resource distribution stems from a variety of factors, including conflict between political and ethnic groups and economic lack of water.

Water's Motivations

Limited availability One of the biggest problems of the twenty-first century is the lack of water. The main causes of water shortage include overcrowding, agriculture, water pollution, and bad government policy. According to the FAO, agriculture—which includes forestry, fisheries, aquaculture, crops, and livestock—is both a source and a sufferer of water shortage. It is thought to be responsible for 70% of the world's water withdrawals, and the rivalry for water from other industries is growing. Freshwater resources are adversely affected by climate change, both in terms of quantity and quality. India's water demand is rising rapidly due to a number of factors, including increased water consumption for agriculture, urbanization, industrialization, and rapid population development (Amarasinghe et al. 2007).

Population increase

The number of people on the planet is increasing by 80 million per year. This implies that we must find a method to supplement the world's water supply with around 64 billion cubic meters of water annually. With more than a billion people, India is the second most populous nation in the world. 569 million people, or around half of India's population, defecate in the open. India will have the largest population in 2030. Millions of people worldwide lack access to water, or if they have, it is not usable for their needs. Only 3% of the water covering Earth's surface is freshwater fit for human use. The majority of the planet is covered by water. The World Wildlife Fund (WWF) estimates that 1.1 billion people globally do not have access to clean water, and that 2.7 billion people experience water

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scarcity for at least one month of the year.

Water pollution

Water pollution is a major issue, particularly in places where there may not be a well-developed sewage infrastructure. Anything from oil to corpses to chemicals to feces may cause pollution. The whole biosphere, including the plants and creatures that live in these bodies of water, is impacted by water pollution. Water resource policy has to be continuously reviewed and revised at all levels due to the serious worldwide issue of water pollution. The demand for freshwater for all purposes will become uncontrollable due to population growth. As per the 2011 report on water quality in India, the anticipated amount of wastewater generated by urban centers is expected to surpass 1,00,000 mld, or millions of liters per day, by 2050. Additionally, rural areas in India are expected to produce at least 50,000 mld due to water supply designs for community supplies in these areas.

Use of agriculture

Ninety percent of the water resources are used for agricultural purposes. Eighty percent of groundwater is used for agriculture and irrigation. Even though agriculture uses a significant amount of water in our nation, creative ways have been found to maintain or even raise yields while increasing water usage efficiency. The figure below illustrates the several ways that agriculture uses water. Future food demand is predicted to be quite high and will have a direct impact on agricultural water use. Additionally, considerable water usage for irrigation is anticipated in the context of growing rivalry between agriculture and other economic sectors due to rising water scarcity and drought caused by climate change (Jiménez Cisneros et al. 2014). A few strategies to optimize and streamline water use in the agricultural sector are essential given the massive amounts of water needed for crop production in order to deal with future projections of water shortages. The purpose of irrigation is to make up for crop evapotranspiration losses and to maximize yield under the specific growing conditions (Doorenbos, 1977).

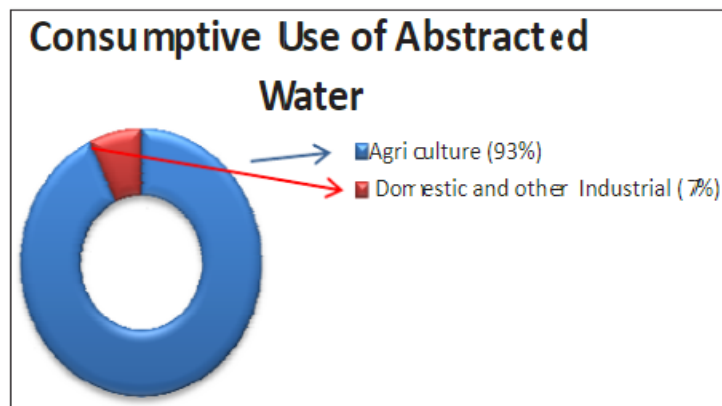


Fig. 1 Source: World bank- World Development Report-2020.

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Governmental regulations

Water may be severely regulated by those in authority in certain nations, particularly those that have dictatorships. As a result, people who may live in such regions may find that water is scarce. It may be a major issue since these regimes utilize it as a means of maintaining control over the people they are in charge of. Strict regulations and appropriate policymaking by the government are the means by which water shortage may be decreased. Government initiatives, such as projects and awareness campaigns to raise public awareness of the value of water conservation and help the nation avoid over-exploitation of its water resources, are crucial in mitigating the problems associated with water scarcity.

Effects of a Lack of Water

An increasing amount of studies is reiterating how crucial water is to maintaining geopolitical stability. Concerns about agriculture and human health are also quite important. Politicians use the availability of water as a weapon or a means of concentrating their influence. It has different effects on millions of farmers' livelihoods and has a significant impact on a nation's ecology.

Insufficient access to potable water

All freshwater resources in the world are thought to be distributed globally and total approximately 43,750 km³ year⁻¹. Of these, America accounts for the largest portion of the global freshwater resource pool at the continental level, with 48%, followed by Asia (28%), Europe (16%), and Africa (9%). America has 24,000 m³ year⁻¹, Europe 9300 m³ year⁻¹, Africa 5000 m³ year⁻¹, and Asia 3400 m³ year⁻¹, according to resources per resident on each continent. There is a shortage of clean drinking water, and millions of humans and other living things spend their whole day looking for it. However, many who have access to clean, safe drinking water misuse it and don't appreciate it. Water scarcity may refer to any of the following: a water crisis, shortage, deficit, or stress. The inability of individuals to get fresh, clean drinking water is the main issue that arises from water shortage.

Hunger

Lack of water causes low output, which results in poverty and hunger. Additionally, animals will perish, which will leave a shortage of meat. In other words, when there is a lack of water, both local animals and humans experience collective famine.

Insufficient Education

People find it challenging to get the education they need or deserve when there is a shortage of water. Why? mostly because those kids are either too ill to attend school or are laboring to assist the family bring water into the house. According to Cairncross et al. (1987), people who lived in a study community without easy access to water said that they sometimes "cooked lentils, and only once a day

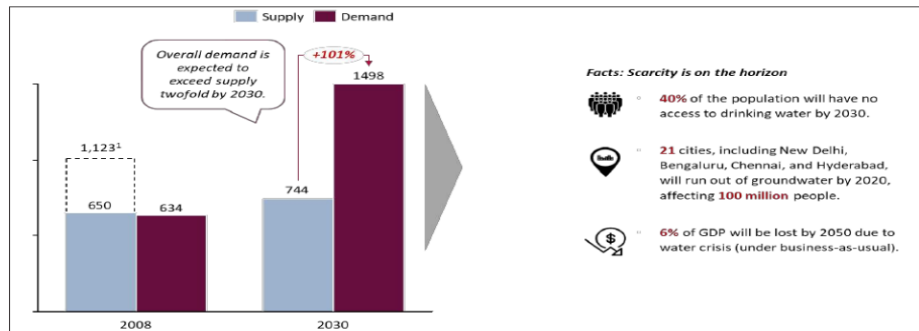


Figure 2: Water supply and demand in India (projected) in BCM (2008, 2030)

Sanitation and other Issues

According to Laxminarayan, Chow, and Shahid-Salles (2006), the World Bank has determined that promoting hygiene is the most cost-effective strategy for controlling high-burden illnesses in poor nations, with sanitation promotion following closely behind. It is well known that inadequate hygiene and sanitation have direct health effects. Ninety percent of diarrheal infections are linked to inadequate sanitation, hygiene, and contaminated water, accounting for around 5000 deaths each day in children (UNICEF, 2006). Lack of access to sanitary facilities and clean water kills more infants in nations with high infant mortality rates than the combined deaths of pneumonia, malaria, HIV/AIDS, and other diseases. In the globe, patients suffering from waterborne illnesses occupy half of the hospital beds. Numerous non-fatal illnesses that affect young children, such as intestinal parasites, blinding trachoma, and impetigo, may also be controlled with good hygiene and sanitation practices. Lastly, children's quality of life is positively impacted by better hygiene and sanitation, and this includes the advantage of living in a home that has a higher possibility of escaping poverty.

The lack of water has an impact on people's quality of life. According to WHO (2014), one in nine people on Earth suffer from illnesses and persistent thirst brought on by drinking contaminated water. Just 18% of individuals without access to better water reside in cities, with 82% of those without it being in rural regions (WHO, 2014). 2.6 billion people worldwide do not have access to hygienic living conditions (UNHDR, 2006). The majority of the world's issues are found in Africa and Asia, since these regions are home to the majority of those affected by hunger, thirst, and related ailments. The achievement of educational objectives is also significantly impacted by inadequate access to water and sanitation, especially for females (DFID 2007). Because it is assumed that girls should carry the water, they avoid going to school. Additionally, girls are prohibited from attending school due to a lack of sanitary facilities during menstruation. Children are prevented from attending school by diseases caused by inadequate hygiene and sanitation, and intestinal worms, which are transmitted by poor sanitation, also hinder cognitive development. Improved school cleanliness increased females' attendance by 11% in Bangladesh, according to research from the United Nations Children's Fund (UNICEF, 1999).

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This effect is probably just as significant as significant educational transformation. According to a 2002 research by Water Aid Tanzania, when clean water was offered accessible eighteen minutes as opposed to an hour away from children's homes, school attendance increased by 12%. Children who wait in line for shoddy shared restrooms at school or in close proximity to their homes also forfeit classwork and homework. Additionally, it has been observed that instructors sometimes object to being assigned to areas with inadequate sanitary facilities. It is impossible to clean food, dishes, or people without access to clean water. Disease ends up being a lot bigger problem than it would have been otherwise when individuals lack access to adequate sanitation. It also contributes to mental health problems including anxiety and sadness.

Minimizing Water Scarcity

India's water supply will be very difficult for a number of reasons. The population is expected to expand to 1.66 billion by 2050, which is the biggest cause for worry. The nation's yearly food needs will surpass 250 million tons due to its growing population. One strategy to lessen the shortage of water has been to increase the capacity for water storage. Rainwater collecting is a crucial component in solving this issue. Both surface and ground water may be ensured by multiplying agricultural ponds, percolation tanks, water reservoirs, and small- to medium-sized dam and river building. Reforestation of degraded forests and development of wastelands by reforestation would aid in soil and water conservation. The most significant clarification is that entwining rivers will help in preventing floods while improving water distribution in the nation (IDSA, 2010).

These are some essential elements for enabling the conversion of accessible water resources into useable water and unconventional techniques for water efficiency. water supply from regions with a plenty of water to those with a shortage. The goal of pricing water and allocating it wisely for various purposes is to promote sustainable development. Groundwater extraction regulations and careful water table monitoring with the use of contemporary scientific methods Sustainability of the current water bodies, including participation from local people and other relevant parties. The overall strategy for flood mitigation calls for connecting several rivers and encouraging soil conservation practices. lessens the demand on the water supply for Special Village Panchayats, Municipalities, and Municipal Corporations.

Agriculture Sector

One key focal strategy for the present state of agriculture is more food, less water. Improving water consumption efficiency and implementing rainwater collection and watershed management strategies are crucial elements in the agriculture industry. Reducing power supply subsidies, especially for water pumping, is another factor in the agricultural sector that prevents groundwater exploitation by enacting differential pricing, incentives, and penalties. implementation of the National River Link project, which intends to create 175 trillion liters of water by connecting 30 rivers and canals.

Industrial Sector

One is the industrial sector. Regulating and subsidizing the recycling and treatment of industrial effluent is a good idea. Promote the use of cutting-edge, water-saving technology.

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Local Market

Within the national economy, establishing regulations requiring rainwater collecting in urban areas and Encouragement of water efficiency and raising public knowledge of water conservation are two ways that the water policy is being strengthened.

Extension of Water Resources

Over the next 12 to 15 years, India's water demand will rise by more than 50%, while the supply will only rise by 5% to 10%. The majority of people would suffer the most from this water shortage issue, especially those who are poor and reliant on agriculture.

Ultimately, there are many ways to lessen water shortage, including expanding the capacity for storing water; using efficient irrigation techniques, creating watersheds, managing water pollution, desalinating seawater, and doing research and development in specific locations. The most crucial and urgently required activity at the moment is rainwater collecting. This method involves gathering and storing rainfall in naturally occurring tanks or reservoirs, or transferring surface water into subterranean aquifers (before it is lost as surface runoff). Because of the paucity of water, this is the ideal moment to rebuild the policy and avert conflict.

CONCLUSION

This study aims to explore and analyze the specifics of water shortage, its issues, and solutions since India and the rest of the globe are facing dire consequences as a result of this issue. There are some regions in the globe where it is declared that no living thing should exist. Therefore, this article addresses the concerning issue of water scarcity, with a focus on emerging sectors like industry and agriculture whose output is negatively impacted by water scarcity. It will have a significant effect on the national economy. To get out of this scenario, strong policies and long-term efforts are necessary. Thus, our future can only be saved by us. Given the present circumstances, effective action is required to avert this calamity by conserving the remaining water sources while maximizing the utilization of cutting-edge technology and resources. The three main industries that use up the most water are household, industrial, and agricultural. Water conservation will thus be aided by the regulatory agencies, such as governments and organizations, establishing strict regulations to stop water abuse and instituting incentives and penalties to promote responsible water usage. Lastly, raise awareness and carry out different programs so that people may comprehend the actual state of water shortage. Thus, the individuals are able to adjust their lifestyle and handle the circumstance.

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