# WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

**TOWARDS A RESILIENT PLANET:**
**ENSURING A SUSTAINABLE AND EQUITABLE FUTURE**

# WATER – KEY FACTS FOR ITS SUSTAINABLE MANAGEMENT IN INDIA

## Water Availability

- India receives about 4000 billion cubic metre (BCM) of precipitation in a year, but 80–95% of this is received during three to four months of monsoon season. Spatial distribution of water is also highly uneven. Annually, arid and semi-arid regions of western India receive 300–500 mm rainfall, while humid regions of eastern India receive about 3000 mm rainfall.[1]
- With the current technological and infrastructural development, less than one-third of this precipitation can be utilized. Annual utilizable surface and ground water resources in the country are estimated to be 690 BCM and 431 BCM, respectively.[1] With increasing urbanization and water demand, the per capita water availability in the country has declined by almost 20% in the last two decades and is likely to decline by another 20% by 2050, making India a water-scarce country.[2]
- Global warming and climate change are expected to further influence the water availability as well as its spatial variability in the country. Since the 1950s, the Indian Meteorological Department has reported a decline in annual rainfall in atleast 14 states covering more than 50% area of the country. Seasonally, monsoon rainfall is reported to be decreasing in more than 20 states, with maximum decline in Uttar Pradesh.
- Groundwater is the main source of domestic water supply for rural and urban India as more than 80% of it is supply sourced through it, making the country the largest user of groundwater in the world.[3] The agriculture sector uses 89% of the groundwater for irrigation while 11% is used in the domestic and industrial sectors.[4] This excessive extraction of groundwater has made almost 22% of assessed blocks as critical or overexploited.[4] At the state level, Punjab, Haryana, Rajasthan, and Delhi are states where Stage of Groundwater Extraction is more than 100% and hence the groundwater is overexploited.[4]

## Water Consumption

- Direct drinking water consumption is limited to 2–4 litre per capita per day (lpcd); however, considering the other daily human needs 135 lpcd has been suggested as the benchmark for urban water supply and 55 lpcd for rural areas.[2] But per capita daily water footprint is estimated to be 1.24 million lpcd[5] considering water is consumed in production of food, dairy products, clothes, and other items of daily human needs.
- The agriculture sector is considered to be the largest freshwater user in the country accounting for almost 85% of total water usage. This is mainly on account of cultivation of water intensive crops such as rice, wheat, sugarcane, and cotton, and very low irrigation efficiency.
- For 2030, it has been projected that the country's water demand would be twice the available supply.[6] This would lead to severe scarcity and affect millions of people along with industrial operations and economic activities.
- Water required for cooking food per day constitutes 6–8% of the total water demand in urban India. This water requirement includes water for cooking and washing utensils. The water demand in food consumption by the end users is expected to increase by 1.5 times for urban India by 2031.[7]
- Of the total electricity production in the country, 83% is based on utilization of water. Also, production of almost one-third of total coal-based electricity, 24% of nuclear electricity, and 22.5% of petroleum refining capacity is dependent on meltwater from snow and ice in Himalayas.[8]

## Water-borne Diseases and Contamination

- India ranks 120 among 122 countries in the water quality index and 133 out of 180 nations for its water availability.[9] It has been estimated that around 40 million litres of wastewater enters Indian rivers and other water bodies every day and only small part of it gets treated properly[10]. In the country, 70% of the water is considered to be contaminated/unfit for consumption.
- Water-borne diseases are quite common in India and they have a significant economic burden which has been estimated to be around USD 600 million per year.[11] Drought- and flood-prone areas are more vulnerable to these diseases and almost 33% of the country has been affected in the last few years. Fluoride and arsenic contamination has affected 1.96 million dwellings in the country.

## Water and Disasters

- India is one of the most disaster-prone countries in the world, with hydrological (water-related) disasters being among the most frequent and having high mortality and damage costs. Out of 10 natural disasters, 9 are water-related.[12] According to International Disasters Database, the country had 278 floods from 1980 to 2017 affecting more than 750 million people and causing about USD 58.7 billion in losses.[12, 13] The average global sea levels are projected to rise at a rate of 2 to 3 mm per year over the coming 100 years. Rising seas threaten millions of people who live in densely populated coastal areas and low-lying islands of the country with 7500 km long coastline stretching through nine states.
- The Intergovernmental Panel on Climate Change (IPCC) projects an increase in both the mean and the extreme precipitation in the Indian summer monsoon. By 2100, extreme rainfall events are very likely in three major river basins, viz. Krishna, Godavari, and Ganga.
- On an average, 80–100 districts received deficient rainfall and were declared drought affected in India, every year including the best monsoon years since 2000.[13]

## Recommendations for Sustainable, Equitable, and Resilient Water Policies

- Reducing the wastage of water and improvement in efficiency of water usage are the key to avoid water-stress scenarios in the country. Adoption of water-saving practices in the agriculture sector can save 6–30% of water in Kharif season and 6–21% in Rabi season.[14]
- Improvement of water-use efficiency in industries, especially thermal power plants, has the potential to save 18–25% of their daily freshwater intake.[15] Moreover, bringing about 10000 hectare of agricultural land under three most water-intensive crops (rice, wheat, cotton/ sugarcane) under Micro-Irrigation System (MIS) can reduce water footprints of a typical 500 MW thermal power plant by 60%.[16]
- Development of water budget and water management plan by commercial/ bulk water users/ group housing societies and societies with multi-storied buildings should be made mandatory.[17]
- Development of an integrated management framework and linking of infrastructure and smart solution schemes related to water, energy and food, within the ambit of city development plans, has the potential to facilitate 'Sustainable Urban Development' of Indian cities.[1]
- Reliable, real-time data on quantity, quality, and water use should be made available to decision-makers at all levels including communities and governments. Real-time decision support and governance mechanisms need to be established for rigorous monitoring and realistic planning. Information and communication technology should be strengthened to collect data and appropriate response.
- The National Water Policy of India needs to be revisited and can include a stronger focus on social and environmental impacts. Progressing from only an individual beneficiary-based approach to area-based approaches is the key. Also, a comprehensive policy promoting the wastewater reuse in all the sectors should be formulated, with specific measures to incentivize it.

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## Endnotes

1 Based on data from CWC, 2013. Water and Related Statistics. Central Water Commission, India.

2 Based on data from https://pib.gov.in/PressReleasePage.aspx?PRID=1604871#:~:text=As%20per%20Ministry%20of%20Housing,to%20higher%20level%20by%20states

3 Details available at https://www.worldbank.org/en/news/press-release/2020/02/17/

4 Central Ground Water Board, Ground Water Year Book - India 2019-20, Faridabad: Ministry of Jal Shakti, Government of India.

5 Details available at https://waterfootprint.org/media/downloads/Hoekstra_and_Chapagain_2007.pdf

6 Details available at http://social.niti.gov.in/uploads/sample/water_index_report2.pdf

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8 Shresth Tayal. 2019. Climate Change Impacts on Himalayan Glaciers and Implications on Energy Security of India. New Delhi: The Energy and Resources Institute

9 Details available at https://www.forbesindia.com/blog/economy-policy/ten-facts-about-drinking-water-in-india-that-may-make-you-sick/

10 Details available at https://www.weforum.org/agenda/2019/10/water-pollution-in-india-data-tech-solution/

11 Details available at https://www.unicef.org/india/what-we-do/clean-drinking-water

12 Details available at https://www.unep.org/news-and-stories/story/devastating-impact-floods-india-and-what-can-be-done

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