IRC + water for people

Climate Change, Water Resources, and WASH Systems

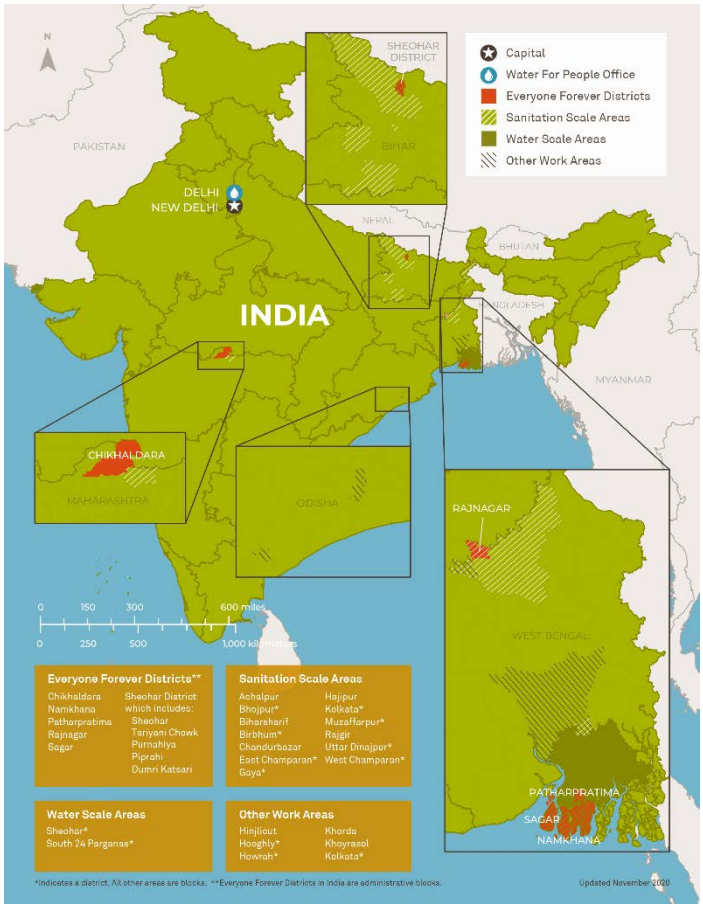
COUNTRY CASE:

INDIA

	Risk	Programming	Policy & Planning	
Polluted water	High	Related	NAP	No
Too little water	High	Related	National climate policies & plans	Some
Too much water	High	Limited	Extent WASH is included	Moderate

Climate trends and impacts on water resources

India is the largest user of groundwater in the world, extracting about 253 billion cubic meters (bcm) per year, which is about 25% of global groundwater extraction. Of the total of 6,584 assessment units (blocks), 1,034 have been categorized as "over-exploited", 253 as "critical", 681 as "semi-critical", and 4,520 as "safe." The remaining 96 assessment units have been classified as "saline" due to non-availability of fresh groundwater. Groundwater in India is primarily extracted for irrigation in agricultural activities, accounting for nearly 228 bcm or 90% of the annual groundwater extraction. The remaining 10% of extraction (25 bcm) is for drinking, domestic, and industrial uses. Industrial use is estimated to account for only about 5% of the annual groundwater extraction in the country. The effects of climate change places increased pressure on this limited supply for drinking and domestic use.[1, 2]



Climate change in India: observed changes[3]

- **Temperature rise**: India's average temperature has risen by 0.7ºC during 1901-2018.
- **Indian Ocean warming:** Sea surface temperatures (SST) of the tropical Indian Ocean has risen by 1ºC on average during 1951-2015, markedly higher than the global average SST warming of 0.7ºC over the same period.
- **Rainfall changes:** Summer monsoon precipitation (June to

[1] Margat, J., and J. Van der Gun, Groundwater around the World, 2013. https://www.un-igrac.org/sites/default/files/resources/files/Groundwater_around_world.pdf.
[2] Government of India, Ministry of Jal Shakti, Dynamic Ground Water Resources of India, 2017. http://cgwb.gov.in/GW-Assessment/GWRA-2017-National-Compilation.pdf
[3] Government of India, Ministry of Earth Sciences, Assessment of Climate Change over the Indian Region, 2020.

September) has declined about 6%, with notable decreases over the Indo-Gangetic plains and Western *ghats*.

- **Droughts:** Overall decrease of seasonal summer monsoon rainfall during the last 6 decades has led to an increased propensity for droughts. Both the frequency and the spatial extent of droughts have increased significantly during 1951-2016.
- **Sea level rise:** Sea levels have risen globally due to continental ice melt and thermal expansion of ocean water in response to global warming. The sea level has risen in the North Indian Ocean at a rate of 1.06-1.75mm during 1874-2004. It has accelerated to 3.3mm per year in last two decades (1993-2017), which is comparable to the current global mean sea level rise index.
- **Tropical cyclones:** There has been a significant reduction in the annual frequency of tropical cyclones over the North Indian Ocean basin during 1951-2018. In contrast, the frequency of very severe cyclonic storms during post-monsoon seasons has increased significantly during 2000-2018.
- **Risks of desertification:** 30% of Indian land is impacted by desertification and degradation, and this outcome is strongly linked to poor water management.

Impacts on WASH infrastructure and services

Water For People works in six blocks of Sheohar District in the state of Bihar; one block in South 24 Parganas District and two blocks in Birbhum District in West Bengal State; three blocks of Amravati District in Maharashtra State; one block each of Ganjam and Khorda Districts in Odisha State; and Kolkota, Howrah, and Hooghly Districts. The focus of IRC's work is in Chhatrapur Block, Ganjam District, and Odisha State. In rural areas, water infrastructure is based on groundwater sources, whereas surface water is the primary source with water treatment plants in urban areas. With the continuous extraction of water for agriculture, industrial, domestic, and other purposes and less focus on recharge measures, the groundwater level is decreasing. Combined with erratic rainfall due to climate change, groundwater sources have low yield and dry up and surface water reservoirs accumulate less water against the storage capacity. Due to this, water scarcity issues arise, resulting in the failure of WASH infrastructure and services in the community. Transition of water infrastructure from community handpumps and stand posts to piped water supply systems with larger networks will create additional burden on the water resources.

Due to the Amphan Cyclone in West Bengal, flash floods destroyed the WASH infrastructure and contaminated water sources. A significant portion of the population in affected districts lost access to safe drinking water and sanitation facilities. The effects of the cyclone during the COVID-19 pandemic were devastating, as the handwashing facilities were not available in many villages, and maintaining safe hygiene practices was not possible.

Bihar is India's most flood-prone state[4] with 76% of people living under the recurring threat of flooding. A major concern is lack of access to clean drinking water and sanitation during floods, resulting in avoidable morbidity and mortality, especially among children. Challenges with water and sanitation services in flood-prone areas are often ignored by local authorities. Floods and water logging contaminate the local water supply and influence WASH practices in the community. In villages, handpumps are the main source of water for drinking and domestic purposes. During a flood, many handpumps get submerged and become contaminated. Communities are often solely dependent on these water sources, which regularly cause incidence of waterborne diseases such as diarrhea, cholera, skin diseases, and eye infections during times of flood. The community often defecates in the floodwater due to the unavailability

[4] Though many districts in Bihar have also been declared drought hit.

of a household toilet or dry land for defecation, creating further risk for waterborne disease and related infections. Floods also bring debris (such as dead animals) and animal and human waste into the water near human habitation, resulting in more water borne diseases.

In Chikhaldara Block of Amravati District, there are acute water scarcity issues during the summer, and water sources have low yield or no yield. Villagers must walk long distances to fetch water, and in some villages, tankers must be deployed. As the water sources have low yield, WASH infrastructure may become abandoned, ultimately leading to low maintenance and failure of the system. These situations worsen when the rainfall is erratic.

Droughts and floods are not uncommon. However, climate change has affected the accessibility to water, creating stress with either too much or too little water supply. It is, therefore, crucial to understand the risks posed by climate change, its impact on drinking water and sanitation services, and its impact on human health. The impacts on water supply include damage to water points due to flooding and loss of water resources due to changing rainfall patterns. Sanitation challenges range from damage or loss of existing infrastructure to the risk of runaway excreta. With many vulnerable communities still collecting water from nearby ponds and rivers, they find it increasingly difficult to locate a source of water during drought. The most vulnerable populations are often the least resilient to deal with the effects of climate change.

Climate and WASH policy and initiatives

Climate change is a global phenomenon with local consequences. There are external and domestic dimensions to India's Climate Change Policy, articulated through two key documents:

- National Action Plan on Climate Change (NAPCC): Adopted on June 30, 2008, the NAPCC has an essentially domestic focus.
- Intended Nationally Determined Commitments (INDC): Submitted to the UN Framework Convention on Climate Change in October 2015, the INDC is a statement of intent on climate change action announced in the run up to the Paris Climate Change Summit held in December of the same year.

With the NAPCC, India committed to launch eight integrated Missions to mitigate climate change:

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Mission on Sustainable Habitat
4. National Water Mission
5. National Mission for Sustaining the Himalayan Ecosystem
6. National Mission for a Green India
7. National Mission for Sustainable Agriculture
8. National Mission on Strategic Knowledge for Climate Change

These Missions recognize that climate change action must proceed simultaneously on several intimately inter-related domains, such as energy, industry, agriculture, water, forests, urban spaces, and the fragile mountain environment.

The key WASH policy and initiatives focusing on the development of sustainable water resources and WASH systems are as follows:

- Ministry of *Jal Shakti*, Department of Water Resources, River Development and Ganga Rejuvenation (Central Ground Water Authority) issued guidelines to regulate groundwater extraction in India in September 2020. The guidelines aim to achieve sustainable water resources management (WRM), regulate groundwater extraction, and conserve the scarce groundwater resources in the country.

- *Jal Jeevan* Mission (JJM) aims to provide safe and adequate drinking water through individual household tap connections to all households in rural India by 2024. The program will also implement source sustainability measures such as mandatory recharge and reuse through grey water management, water conservation, and rainwater harvesting.
- *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY) extends irrigation coverage with the goal of *Har Khet Ko Pani* (Every Farm Has Water). The program aims to improve water use efficiency in a focused manner ("More Crop per Drop") with an end-to-end solution on source creation, distribution, management, field application, and extension activities. PMKSY amalgamates ongoing schemes, including the Accelerated Irrigation Benefit Programme of the Ministry of Water Resources, River Development and Ganga Rejuvenation, the Integrated Watershed Management Programme of the Department of Land Resources, and the On Farm Water Management of the Department of Agriculture and Cooperation.

Country program activities: mitigation and adaptation

Village Water Safety and Security (VWSS) Plans are developed for program villages and at block levels in West Bengal, Bihar, and Maharashtra. The VWSS Plan is required to ensure the optimum utilization of available water within the community. Water For People supports program villages in preparation and implementation of VWSS Plans with a participatory process that includes capacity building of stakeholders, including *Gram Panchayat* (GP) members, Village Water Sanitation Committee members, Village Water Sanitation Hygiene Nutrition Committee members, and Water User Committee members. The VWSS Plans are incorporated into GP Development Plans and aim to ensure sustainability of sources and operation and maintenance systems and strengthen water quality monitoring systems and processes.

The government's emphasis on the preparation of VWSS Plans is highlighted in the National Rural Drinking Water Programme Guidelines. Village Action Plans, developed through a participatory process during VWSS planning, are implemented through the convergence of various government schemes, such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS), 15th Finance Commission, and JJM initiatives.

In Sheohar District in Bihar, high raised platforms are constructed for community handpumps. Construction considers the high flood level in villages, and the platforms help the water users immensely. The community water points did not get contaminated due to water logging, and users are able to fetch water from the raised platform handpumps.

In Ganjam, IRC has been working on VWSS Plans and mobilizing funds for these from local government, leading to rehabilitation and some new infrastructure (boreholes). This increase in civil society engagement can be considered a form of strengthening resilience. Furthermore, we have conducted institutional mapping[5] and are investigating how work under MNREGS, a key program that responds to village level water security infrastructure, allocates work towards water security in two states (Bihar and Odisha).

Key Challenges

- The impacts of climate change on both the supply and demand sides of WASH delivery systems are variable and unpredictable.
- There is major focus on WASH infrastructure development, with less importance given to water resources development. With depleting water resources due to climate change

[5] https://www.ircwash.org/sites/default/files/20200513_enabling-environment-for-water_security_factsheet_v5.0.pdf

and less focus on replenishment of resources, there is major risk to the sustainability of WASH systems.

- Demand for water is constantly increasing while supply is decreasing, and there is a lack of coordination between the WASH and WRM sectors. Both sectors depend on well trained specialists, but from different disciplines, with different technologies and methodologies. WASH planning occurs at the *Panchyat* or block level, whereas WRM planning occurs at the catchment area, basin, or watershed level. Within the context of climate change, this lack of coordination affects water resources and, subsequently, WASH systems.
- Access to data for planners and implementers at the field level has always been a challenge. For example, a WASH system connected to a water resource without studying the hydrogeological data, aquifer mapping reports, or source yield directly affects the sustainability of the WASH system.
- Increased demand for water due to low rainfall can cause water sources (including boreholes and springs) to run dry. Conversely, heavy rainfall and flooding can damage water sources and sanitation facilities, carrying runoff and waste into streams and lakes and contaminating the water supply.
- Capacity, or rather the lack of capacity in the WASH sector, is a key issue and often a limitation to tackling both immediate and long-term challenges. Significant improvements in the WASH sector will not be achieved without strengthening capacity, irrespective of the additional challenges posed by climate change.
- Both water and climate are becoming more politicized, which on the positive side allows citizens to change governments when needs are not met. On the other side, political mandates such as providing free water may prove expensive and unaffordable in the long run.