



# Water and Sanitation in India

A STUDY ON ISSUES & SOLUTIONS

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## Historical Background

Water and sanitation is a longstanding problem in India. Despite the continuous efforts of the Government and people alike, water and sanitation supplies are still inadequate.

The efforts can be traced back to 1954, when special attention was given to water supply and sanitation in the *First Five Year Plan*, which welcomed the National Water Supply and Sanitation Program. Its purpose was to establish stable and adequate water supply to areas around the country, with emphasis on “problem areas” which consisted of communities which historically lacked a stable water supply.

The Accelerated Rural Water Supply Program, which was initiated in 1972-73 helped direct funds to efficient state programs addressing the issue. In 1975, the Minimum Needs Program was instituted to focus on areas with disconnected communities.

1980 marked the beginning of the International Drinking Water and Sanitation decade, which brought back the focus of the Government of India to this issue. In the Sixth Five Year Plan, the Government of India laid down its first targets in the domain:

- 100% coverage for water
- 80% coverage for urban sanitation
- 25% coverage from rural sanitation

Before 1986, the main focus of the Government was to distribute funds, while it shifted to increasing sanitation in rural areas in the coming years. Special attention was paid to ensuring the dignity and privacy of women in such programs.

The structure of the CSRP model was changed in 1999 and was changed from a high subsidy model to a low subsidy model. There was an increase in the emphasis on public participation. Also the approach changed from being majorly supply driven to demand driven. In 2001 the Total Sanitation Campaign was introduced which had its main objective as creating awareness among the masses. It was renamed to Nirmal Bharat Abhiyan in 2007 and now focused on providing toilets and basic sanitation facilities to households belonging below the Poverty Line.

## Present Scenario

### WATER AVAILABILITY

In a span of 60 years from 1951 to 2011, the per capita availability of water has come down from 5177 cubic meters to 1545 cubic meters. This marks a 70% downfall in availability of water and is testimony to the deepening water crisis in India. Several parts of the country are suffering from a lack of water due to droughts and supply crises.

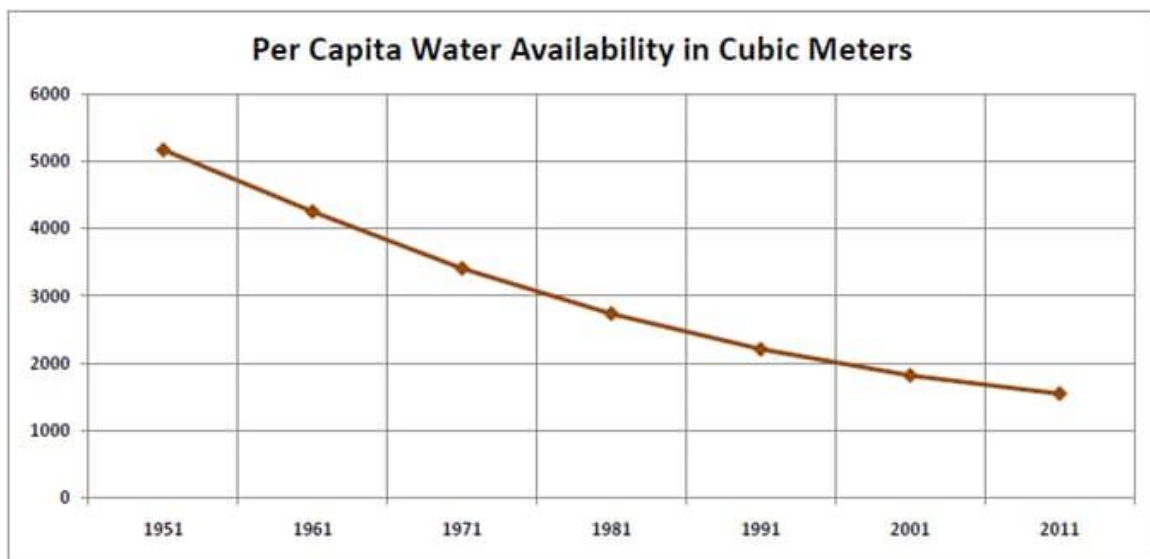


Figure 1: Per capita water availability trend for 1951 – 2011<sup>[1]</sup>

The reasons for the decrease in water availability can be mainly attributed to:

- an increase in population,
- overexploitation of groundwater, and
- a lack of water harvesting

Based on groundwater development and monsoon trends, the Central Ground Water Board (CGWB) categorised 6607 blocks as *Critical*, *Semi-critical*, *Overexploited*, etc. The results indicate that one of every six blocks in the country is overexploited in terms of groundwater usage.

## ACCESS TO WATER AND SANITATION

Access to improved water sources and improved sanitation is an important and widely accepted metric to assess the development of supply. An **improved water source**, is one that by design, is protected from contamination. As of 2008, 88% of the Indian populace could access an improved water source.

**Improved sanitation** is a term given to the facility that can exclude human excreta from contact through a hygienic method. India has consistently had a poor performance in this metric, and only 31% had access to improved sanitation. It is also a concern that the figure drops to just 21% if only rural areas considered.<sup>[1]</sup>

Another interesting metric is assessing how far one person has to travel to gain access to drinking water. The following infographic is based on data from an answer to a question posed in the Lok Sabha.

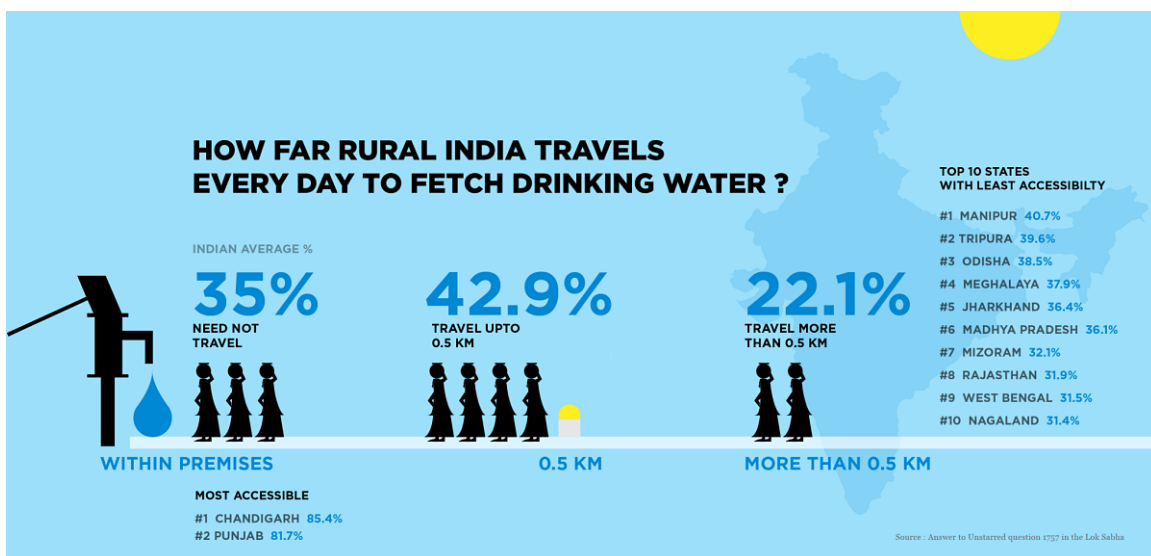


Figure 2: Average distance covered to fetch drinking water<sup>[3]</sup>

Hence, it is of no surprise that sanitation forms one of the greatest areas of concern for the Government of India, especially considering how strongly sanitation and other areas are linked. Specifically,

- **HEALTH**

In India, about one thousand children below the age of five die each year to due to diarrhoea, hepatitis, and diseases attributable to poor sanitation. This is surprising because diarrhea is one of the easiest curable diseases with an extremely cheap cure - zinc oxides and related salts, also called ORS.

A survey of sewage works indicated that most of them suffer from chronic diseases, a direct indication of the levels of contamination of Indian water sources, sewage systems and sanitary conditions for workers in the field.

- **EDUCATION**

According to the Public Health Engineering Department (PHED), sanitary conditions not only contribute to poor health but also negatively influence learning and attendance at school. Especially with female students, lack of facilities and unhygienic conditions prevent students from participating at school.<sup>[2]</sup>

Another pressing issue is that approximately 626 million people in India continue the practice of open defecation, a figure which makes India the global leader in this metric. Open defecation is an issue which has widespread public health effects, and is the cause of various diseases from the common diarrhea and worm infections to typhoid, polio, trachoma among others.

The following figure gives us an idea of the availability of toilets in various parts of the country.

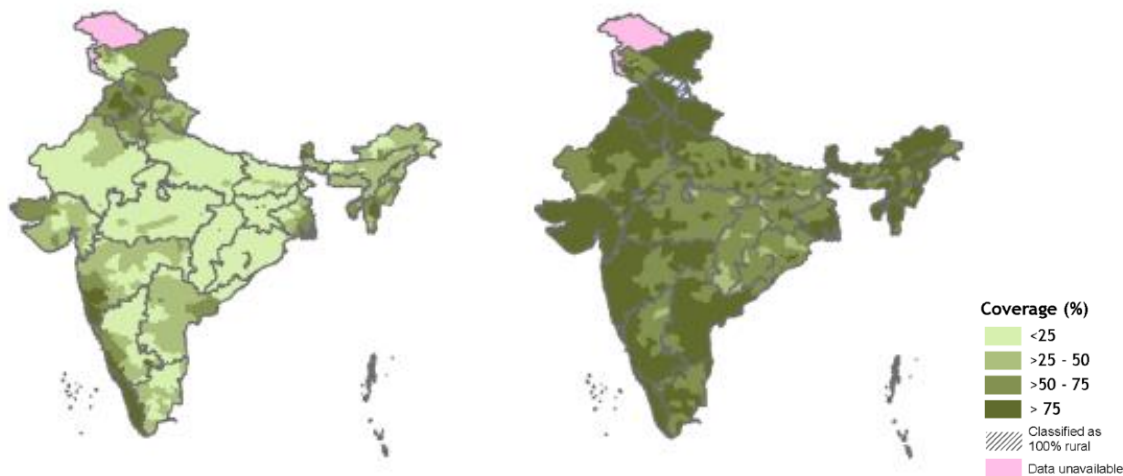


Figure 3: Toilet coverage in rural (left) and urban (right) India<sup>[4]</sup>

Interestingly, the solution to open defecation does not consist of just construction of toilets. The Government of India, among several developing countries, has realized the importance of a focus on behaviour change to eradicate open defecation in the country.

## Initiatives by the Government

This section consists of noteworthy programs by the Government.

### NATIONAL RURAL DRINKING WATER PROGRAM

The first scheme to address the problem of access to safe drinking water in rural areas was the Accelerated Rural Water Supply Programme (ARWSP) which was launched by the government in 1972–73. In 2009, ARWSP underwent some major revision to tackle issues like sustainability and poor water quality and was renamed as the National Rural Drinking Water Program.

Some salient features and areas of focus of NRDWP [5]:

- Moving forward from achieving habitation level coverage towards household level drinking water coverage.
- Moving away from overdependence on single drinking water source to multiple sources, through conjunctive use of surface water, groundwater and rainwater harvesting.
- Ensuring sustainability in drinking water schemes and preventing slip back.
- Encouraging water conservation methods including revival of traditional water bodies. Convergence of all water conservation programmes at the village level.
- Ensuring household level drinking water security through water budgeting and preparation of village water security plans.
- Consciously moving away from high cost treatment technologies for tackling arsenic and fluoride contamination to the development of alternative sources in respect of arsenic contamination and alternate sources/dilution of aquifers through rainwater harvesting for tackling fluoride contamination.
- Developing the capability of preliminary drinking water testing at the Gram Panchayat level.
- Establishing Water Testing Laboratory facilities with respect to drinking water, at the district and subdivision level.

## SWAJALDHARA: A DEMAND DRIVEN APPROACH

Typically, water supply schemes have been centralised and supply driven. State governments build big projects keeping only the supply in mind. Swajaldhara was rolled out in 2002 with the intention of decentralizing the responsibility of water supply delivery to local panchayats and user groups, who are also required to pitch in about ten percent of the capital. This tariff eventually also covers the maintenance and operation cost of the infrastructure. Local panchayats are consulted before construction of infrastructure and trained in capacity building. A World Bank study from 2008 reported that Swajaldhara resulted in lower costs of infrastructure and operation and better service quality compared to the supply-driven approach in 10 states.

## SWACHH BHARAT ABHIYAN

Swachh Bharat Abhiyan, launched in 2014, is the first nationwide initiative which is centered around inducing behavioural changes and creating demand for sanitation. Swachh Bharat Abhiyan has been a successful paradigm shift from the old approaches of enforcement and implementations of policies which disregarded the deep seated socio-cultural context of the problem.



Figure 4: Logo of Swachh Bharat Abhiyan

Apart from the nationwide awareness campaigns, large scale construction of public toilets to combat the problem of rampant public defecation has also been a core part of the initiative.



## Innovative Solutions

This section consists of existing solutions, applied in India or elsewhere, which we find innovative and can be immediately applied to most places in the country.

### MICRO-CREDITS FOR WATER SUPPLY AND SANITATION

A micro-credit based approach is the method of supplying small scale loans (or *micro-credits*) to households and small scale industries in order to improve the water and sanitation situation in developing countries.

In this approach funding is either provided to households or to small scale contractors in order to provide water to these households, create and maintain water connections, improve plumbing, installation of latrines, etc.

There are three types of water and sanitation based micro credits:

- those which aim to improve the situation at the household level
- credits for small or medium contractors for providing water and sanitation based solutions
- for upgrading city water based services, especially in low income areas

The main difference between the microcredit based approach and the normal loans is that microcredits help make these households self-sustainable in their water and sanitation needs and help them in enabling themselves to deal with such problems. Also this approach helps small enterprises and households rather than large industries.

Some examples of organisations that provide microcredit based solutions are:

- WaterCredit by Water.org is a US based initiative that provides such loans in many countries including India and Bangladesh.
- SEWA Bank
- Grameen Bank

## COMMUNITY-LED TOTAL SANITATION

Community-led total sanitation is an innovative practice that helps communities tackle the problem of unsanitary practices such as open defecation. It mainly creates a behavioural change in people so that they do not indulge in such practices. Thus this does not require heavy funding as there is no infrastructural requirement such as toilets.

CLTS uses techniques to associate and create pathways between the mouth and excreta in order to motivate people to take action. They use terms such as “shit” and other crude words instead of excreta or feces in order to repulse people from indulging in such practices. One method often followed is that the volunteers put food/water and feces in front of the people and make them see as the flies wander between the two. This creates a repulsive feeling among the people and often helps in solving the problem of open defecation.

## Proposed Solutions

This section consists of our suggestions, inspired by existing solutions to the water and sanitation problem in India.

### INCLUSION OF NREGA IN IMPROVING SANITATION

Due to Swachh Bharat Abhiyan, there has been an increase in the quality and quantity of toilets. However, the maintenance of these toilets has remained a major issue. To tackle this problem, we propose an association between National Rural Employment Guarantee Act (NREGA) with the Swachh Bharat Abhiyan. People would get jobs under NREGA to maintain the toilets constructed because of SBA. This would increase the jobs in the district and also help in the keeping the toilets clean and usable. In order to make sure that the workers are indeed working properly we can use a computerised method of taking the attendance.

We can use biometrics to make sure that the worker is regular. Also a major issue associated with this would be the lack of workers ready to do the job because of its difficulty and the social taboo associated with it. One way to resolve the issue, albeit partially, is to increase the pay given to such workers.

### SMART TANKERS

Water supply management is an issue that haunts urban as well as rural areas. This idea, inspired by a previous solution, aims to combat the problem of when tankers do not reach the intended areas or lose a lot of water in the process.

This proposed solution consists of:

- Installing a device which measures the water level in the tanker
- Installing a GPS device on the tanker which can accurately provide the location of the given tanker
- An automated web/mobile portal where the locations and water levels in these tankers can be tracked

This solution will make live data available to the public at a marginal cost, and is extremely efficient in identifying wastage/corruption in water supply management.

## COMMUNITY-LED ICT-BASED SOLUTION

There have been apps in many cities that allow users to post photos of dirty areas in their neighbourhood and allow the other users of the app to clean such areas themselves and get incentives for doing so. Such applications can also add a feature to alert the relevant authorities which will take up the matter of cleaning such areas themselves. This app allows the users to be aware of their surroundings and thus affect a change themselves.

## References

- [1] [UNICEF/WHO Joint Monitoring Programme for Water Supply and Sanitation estimate for 2008 based on the 2006 Demographic and Health Survey, the 2001 census, other data and the extrapolation of previous trends to 2010](#)
- [2] [Times of India on sanitation and children-related sanitation issues](#)
- [3] Unstarred question 1757 posed in the Lok Sabha
- [4] Global Atlas of Helminth Infections, based on 2011 National Census
- [5] [National Rural Drinking Water Programme by Ministry of Rural Development](#)
- [6] [India's Sanitation Story](#)
- [7] [The Past, Present, and Future of Sanitation, with a Case Study of India](#)