Rural Drinking Water in India: An Overview

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Abstract

Drinking water is an essential element for living. Article 47 of the Constitution of India makes it a top priority for the governments to provide safe and clean drinking water to every citizen of the country. In a country like India where more than 67 percent of the people still live in rural areas the challenge of providing drinking water is in itself a daunting task. Rural India has more than 700 million people residing in about 1.42 million habitations spread over 15 diverse ecological regions. Meeting the drinking water needs of such a large population can be a daunting task. The non-uniformity in level of awareness, socio-economic development, education, poverty, practices and rituals and water availability add to the complexity of the task. The government has also outlined requisite mechanisms to monitor the quality of drinking water and devise effective Information, Education and Communication (IEC) interventions to disseminate information and educate people on health and hygiene. The main objectives of this article are to analyze the role of rural drinking water facility in India.

I. Introduction

Drinking water is an essential element for living. Article 47 of the Constitution of India makes it a top priority for the governments to provide safe and clean drinking water to every citizen of the country. In a country like India where more than 67 percent of the people still live in rural areas the challenge of providing drinking water is in itself a daunting task. It becomes even more onerous when there is an insistence that the drinking water should be of a certain quality deemed safe. Traditionally villagers and their community leader took the task of securing whatever water that was available and conserved it to meet their year round needs. Rural India has more than 700 million people residing in about 1.42 million habitations spread over 15 diverse ecological regions. Meeting the drinking water needs of such a large population can be a daunting task. The non-uniformity in level of awareness, socio-economic development, education, poverty, practices and rituals and water availability add to the complexity of the task. A regular access to safe drinking water and sanitation is critical for healthy living. The government is solely responsible for provision of clean drinking water and sanitation to improve the health status of a population. According to 2011 census, the households having no latrine in the country were 53.1 percent, compared to 63.6 percent in 2001. In Bihar, no less than 76.9 percent of households were found to have no latrines in 2011, compared to 80.8 percent households in 2001. This decadal decrease of only 3.9 percentage point is very small and is a matter of concern. Despite an estimated total of Rs. 1,105 billion spent on providing safe drinking water since the First Five Year Plan was launched in 1951, lack of safe and secure drinking water continues to be a major hurdle and a national economic burden. Around 37.7 million Indians are affected by waterborne diseases annually, 1.5 million children are estimated to die of diarrhoea alone and 73 million working days are lost due to waterborne disease each year. The resulting economic burden is estimated at $600 million a year. While 'traditional diseases' such as diarrhoea continue to take a heavy toll, 66 million Indians are at risk due to excess fluoride2 and 10 million due to excess arsenic in groundwater. In all, 1,95,813 habitations in the country are affected by poor water quality. It is clear that the large investments have not yielded comparable improvements in health and other socio-economic indicators. In order to focus universal sanitation coverage, the Prime Minister has launched the Swachh Bharat Mission on October 2, 2014, with two Sub-Missions — Swachh Bharat Mission (Gramin) and the Swachh Bharat Mission (Urban). This Mission aims to achieve Swachh Bharat by 2019, as a fitting tribute to the 150th Birth Anniversary of Mahatma Gandhi. In rural areas, it aims to improve the levels of cleanliness through Solid and Liquid Waste

Management activities and making all villages Open Defecation Free (ODF), clean and sanitised. Bihar has done well in terms of coverage of rural and urban habitations with safe sources of drinking water, including piped water supply, tube wells and shallow wells.

Table 1 : Achievement under Water Supply and Sanitation

(Figures in Number)

Year	Handpumps Installed	Slipped back Habitations/ Water quality problems covered	Individual Household Latrine (IHHL) constructed			Construction of		
			APL	BPL	Total	Sanitary Complex	School Toilet	Anganwadi Toilet
2010-11	58597	13922	173219	557312	730531	66	8401	315
2011-12	28286	11243	193875	646052	839927	132	22575	1521
2012-13	31926	10960	236021	560678	796699	214	17009	4822
2013-14	34289	12787	63190	98456	161646	36	5076	1437
2014-15	24287	12236	47056	118401	165457	20	1046	11

Source : Public Health Engineering Department, GOB

In Bihar, the coverage of households using tap water, tube well water and well water was 86.2 percent in 2001, which increased 94.0 percent in 2011. The progress of work under water supply and sanitation is presented in Table 1. In 201415, as many as 24.3 thousand handpumps have been installed under the National Rural Drinking Water Programme (NRDWP). The goal of NRDWP is to ensurethat, by 2022, every rural household in the country has access to at least 70 litres of waterper capita per day (Ipcd) within their household premises or at a distance of less than 50 meters from their households. In 2014-15, there were also additions in the construction of individual household latrines (1.65 lakh), sanitary complexes (20), school toilets (1046) and Anganwadi toilets (11). The smaller figures for sanitary complexes, school toilets and Anganwadi toilets is mainly because most of them have already been covered in previous years. The fund utilisation under National Rural Drinking Water Programme (NRDWP), during the period 2010-11 to 2014-15 is shown in Table 1. The utilisation of fund has increased steadily, from 79.5 percent in 2010-11 to 88.0 percent in 2014-15. This significant increase in fund utilisation has definite impact on physical achievement.

Table 2 : Financial Progress; under NRDWP

(Rs. crore)

Year	2010-11	2011-12	2012-13	2013-14	2014-15
Outlay	530.32	440.8	351.02	353.8	426.35
Expenditure	421.40	364.22	283.50	299.02	375.38
Percentage of Utilisation	79.5	82.6	80.8	84.5	88.0

Source : Public Health Engineering Department, GOB

The financial and physical progress for water supply and sanitation schemes under state plan are presented in Tables 2 and 3. The annual growth rate in expenditure in the past five years (37.6 percent) was slightly lower than the rate of growth in outlay (43.2 percent). The physical progress under the state plan schemes has also improved, except for the Rural Piped Water Supply Scheme. The achievement rate for installation of new hand pumps has increased from 32 percent in 2010-11 to 41 percent in 2014-15. The achievement rate of covering uncovered habitations is also higher in 2014-15 (94 percent), compared to 2010-11 (74 percent).

Table 3 : Financial Progress in State Plan Schemes for Water Supply and Sanitation

(Rs. crore)

Year	2010-11	2011-12	2012-13	2013-14	2014-15	CAGR
Outlay	223.41	259.49	554.10	745.59	793.68	43.20
Expenditure	207.86	224.71	302.54	645.94	604.91	37.61
Outlay as Percent of Expenditure	93.0	86.6	54.6	86.6	76.2	-

Source : Public Health Engineering Department, GOB

II. Government Initiative

The Government of India launched the National Rural Drinking Water Quality Monitoring and Surveillance Programme in February 2006. This envisages institutionalization of community participation for monitoring and surveillance of drinking water sources at the grassroots level by gram panchayats and Village Water and Sanitation Committees, followed by checking the positively tested samples at the district and state level laboratories. Since 2000, water quality monitoring has been accorded a high priority and institutional mechanisms have been developed at national, state, district, block and panchayat levels. The government has also outlined requisite mechanisms to monitor the quality of drinking water and devise effective Information, Education and Communication (IEC) interventions to disseminate information and educate people on health and hygiene. There can be little doubt that water is a basic necessity for the survival of humans. There is interplay of various factors that govern access and utilisation of water resources and in light of the increasing demand for water it becomes important to look for holistic and people-centred approaches for water management. Clearly, drinking water is too fundamental and serious an issue to be left to one institution alone. It needs the combined initiative and action of all, if at all we are serious in socioeconomic development. Safe drinking water can be assured, provided we set our mind to address it.

III. Role of Government

1. Capacity Building of Communities : The roles of panchayats are becoming more important and stress is being laid on community-based approaches in dealing with water-related problems. A prerequisite for increasing community participation is training of people form the communities so that they are able to make well-informed decisions. The objectives of decentralisation can come about only if there is an attitudinal change among government functionaries as well as the people, with respect to decentralisation, transferring authority and responsibility to the people at the community level. The role of the government in implementing capacity building programmes is essential.

2. Supporting Awareness Drives : One of the major challenges is to make people aware on the need to consume safe water. There are examples where despite being provided potable water by the government, people drink water from contaminates surface sources. The government needs to support civil society and organisations involved in increasing awareness. An integrated campaign can result in wide spread information dissemination amongst the masses on the ways and means of preventing contamination of water sources.

3. Making the Service Provider Accountable : Article 21 of the Constitution of India, relates to the Protection of Life and Personal Liberty and the right to pollution-free water is guaranteed under this provision. The user has the right to know whether water being provided at source is free from any contamination as claimed by authorities. Financial expenditure on water supply schemes and testing water

quality should be known to the public. The example of Tamil Nadu water supply and drainage board should be emulated by other states where financial expenditure is in the public domain through their website.

4. Testing and Remedial Action : There is an urgent need to enhance the monitoring network by establishing monitoring stations across all regions and seasonal assessments of all water sources. In case of contamination being detected, an action plan for dealing with sources should be provided. The challenge lies in establishing well equipped laboratories with well-trained staff. This also calls for training of people and infrastructure development. Although there has been wide usage of field testing kits, they often give false or semi-quantitative results. One can rely on field testing kits for a broader picture, but laboratory tests are necessary for accurate results. The generated data should be made available in the public domain. The data in respected of water quality affected habitations is available in the website of DDWS but many of the state water and sanitation departments do not have such data. Generating data, its interpretation and communication is essential for effective management of water and the use of Geographical Information System (GIS) can assist in mapping, modelling and decision-making.

5. Inter-agency Coordination : One major bottleneck in an effective policy formulation and implementation has been the current institutional set-up involving various government agencies. There is a fragmented approach at the state and central level with the involvement of numerous agencies in the supply and management of water. Better co-ordination amongst ministries and departments would ensure effective implementation. The option of a single nodal ministry with the overall supervision and administration pertaining to water resources may be looked into as is the case with countries like Australia.

6. Water Quality Standards and Provision of Water under the Food Law Bill : The quality of drinking water supplies in India by public agencies is presently governed by Bureau of Indian Standards (BIS) specifications IS: 10500-1991. In case of drinking water monitoring, standards such as IS: 2488, for sampling methods and IS: 3025 for testing procedures should also be adhered to. Prior to drafting of standards it is important to establish the precise dose-response mechanism through appropriate epidemiological studies both in rural and urban areas. However, the World Health Organisation (WHO) has its own standards and in some cases, there is a difference in the permissible limits between the two. The best example is of arsenic, for which the WHO's prescribed limit is 10 ppb (parts per billion) and that of BIS is 50 ppb. There have been discussions at the national level to re-look at the current standards and modify them. The Government of India is considering the issue of regulation of drinking water by making suitable provision in the integrated Food Law Bill. Various formulations on the issue of either putting water in the definition of food, or alternatively, having a separate provision for schemes related to water and their implementation or their inclusion in the Integrated Food Law is under consideration.

7. School Water Supply Programme : India has one of the largest numbers of school going children, especially in rural areas with about 6.3 lakh rural schools. As per National Family Health Survey 75 percent of the children in the age group of 6-14 years are attending schools in rural areas. A matter of concern is that out of these 6.3 lakh rural schools only 44 per cent have water supply facilities. The survey also points out that half of all Indian children are undernourished and half of all adult women suffer from anaemia. At the time of the survey, 30 per cent of all children under the age of three had fever, another 20 percent had diarrhoea, and another 20 per cent had symptoms of acute respiratory infection. These figures portray a grim picture with almost half of our country's children suffering some form of ailment. The Government of India has launched school water supply, sanitation and hygiene education programme (SSHE) through the Ministry of Rural Development under the Accelerated Rural Water Supply and Swajaldhara Programmes

and the Sarva Shiksha Abhiyaan of the Ministry of Human Resource Development which has provisions for setting up schools with facilities for effective water supply and sanitation. By focussing on children today and providing them with knowledge with regard to maintaining water quality and effective sanitation practices we will be securing the upcoming generation from the threats of water and sanitation related diseases. This will not only provide a hygienic environment in schools, the children will also convey the message back home.

8. Role of Environment Sanitation and Hygiene : A direct relationship exists between water, sanitation, health, nutrition and human well-being. Consumption of contaminated drinking water, improper disposal of human excreta, lack of personal and food hygiene and improper disposal of solid and liquid waste have been the major causes of diseases in our country. There has been a key focus in various government programmes like the Total Sanitation Campaign to spread the message of maintaining personal hygiene for reducing water pollution. Better linkages between ministries of health and rural development for developing programmes to solve problems of drinking water and health will be useful.

IV. Role of Civil Society and Communities

9. Awareness : The user should be made aware of the importance of preventing contamination of water and also of the importance of clean and healthy surroundings near water sources. Effective IEC campaigns by civil society will play an important role in spreading awareness. One has to keep in mind that such campaigns should be based on the local needs and problems and use tools that are easily understandable by the people.

10. Accountability : Users should also realise their individual responsibility in maintaining the quality of water supplied to them. Cultural and behavioural practices like open defecation, bathing of cattle results in contamination of water sources. The responsibility of maintaining the safety of water provided also rests with the users. Factors like contamination at source and storage in clean vessels lies with the users.

11. Community Based Water Quality Monitoring : Many water quality problems are caused due to communities being-unaware of the different aspects of managing and maintaining the quality of water resources. Raising their awareness of appropriate practices will help them realise the grim realities of depleting water sources and at the same time help in engaging them in monitoring and maintenance. There have been initiatives for community driven water monitoring programmes, such as the Community-managed Water Quality Surveillance Programme in Alappuzha district of Kerala by the Socio-Economic Unit Foundation, where the responsibility of management and operation of the water quality surveillance system has been entrusted to women's groups, called Water Quality Surveillance Groups (WQSG), as a self employment programme.

12. Maintenance : The lack of maintenance of rural water supplies and infrastructure is an area of concern. This may be due to lack of funding capacity, apathy or unwillingness on the part of the communities to handle operation and maintenance. This calls for a change in the shift among the users that the onus of maintaining a water source rests with the people and the communities as they are the owners of the system and are most likely to be impacted in case of the degradation of the water supply system. This calls for joint implementation by panchayats and communities.

V. Conclusion

India has witnessed significant improvement in rural water supply with increasing coverage of areas and a large volume of financial resources made available. A series of schemes are aimed at improving the supply of drinking water for rural habitations and now for monitoring and ensuring quality. The past few years have seen greater emphasis on water quality monitoring and surveillance with specific allocation being made under Central grants. There has been great focus on setting up and upgrading laboratories at the state and district levels, and on water monitoring through field testing kits. However, awareness, surveillance, monitoring and testing, mitigation measures, availability of alternate water sources and adoption of hygienic practises continues to remain roadblocks. There is a need to promote sanitary inspection along with the community based water quality monitoring and surveillance at the grass root level as a mechanism to identify problems and to take corrective measures. One of the greatest challenges has been the convergence of various departments associated with water: water and sanitation programmes have operated largely in isolation from programmes in health and education. A wider approach is needed where water and sanitation issues are looked at with the aim of reducing disease, improving hygiene, improving educational levels and reducing poverty.

Some suggestions are :

1. **Funding Arrangement** : Suitable institutional and funding arrangements through community participation need to be evolved to get the installations working.
2. **Participatory Communication :** Participation of village women and NGOs, voluntary organisations should also be encouraged.
3. **Participation of stakeholders :** Emphasis must be laid on the participation of stakeholders at all levels, from planning, design and location to implementation and management.
4. **Village Water Committees :** 'Village Water Committees' should be actively involved in the maintenance of drinking water supply schemes and a system of beneficiary participation introduced.
5. **Information, Education and Knowledge :** Information, education and knowledge should be given on the health and hygiene issues. The community has to be made conscious about water quality through health education and awareness campaigns and water testing kits shall be made available to a range of institutions, including schools and colleges and qualified NGOs in the area.
6. **Water Quality Management :** The choice of technology in case of schemes related to water quality (detection of fluoride, iron, arsenic), shall be district/block specific. Further research is required to improve available technologies for treatment of chemically contaminated water, in terms of their simplification and increased cost effectiveness.
7. **Water quality monitoring and surveillance systems :** In view of the increasing problem of water quality and the resultant health hazards, it is necessary to institutionalise water quality monitoring and surveillance systems. Water quality surveillance should be done by an independent organisation, more appropriately by the Health Department which should be provided with adequate funds for the task.

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