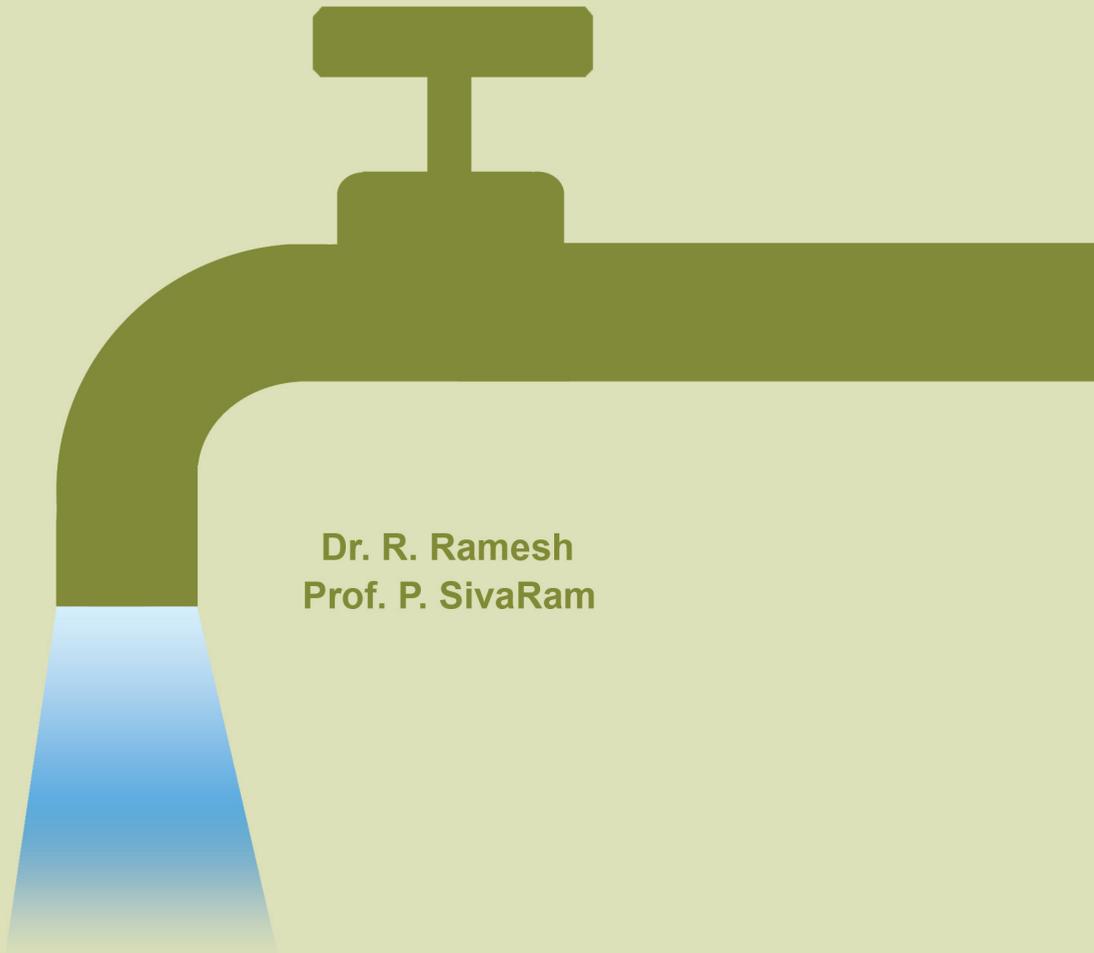


Distributional Equity of Rural Drinking Water

A study on inclusive service delivery



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CONTENTS

| Contents | Page Number |
|---|-------------|
| Abbreviations | |
| Executive Summary | 1 |
| Chapter-1: Introduction | 3 |
| Chapter-2: Research Design | 12 |
| Chapter-3: Profile of the Study Area | 22 |
| Chapter-4: Analysis & Discussion | 28 |
| Chapter-5: Findings, Conclusions & Further Research | 41 |

List of Abbreviations

| | |
|-------|---|
| APL | - Above Poverty Line |
| BPL | - Below Poverty Line |
| EPW | - Economic & Political Weekly |
| GoI | - Government of India |
| GP | - Gram Panchayat |
| IAY | - Indira Awaas Yojana |
| LPCD | - Litre per capita per day |
| RWS | - Rural Water Supply |
| MDWS | - Ministry of Drinking Water and Sanitation |
| NRDWP | - National Rural Drinking Water Programme |
| SC/ST | - Scheduled Caste/Scheduled Tribe |
| SECC | - Socio-Economic and Caste Census |
| T&D | - Transmission & Distribution |
| TDS | - Total Dissolved Solids |
| PHED | - Public Health Engineering Department |
| OBC | - Other Backward Communities |
| O&M | - Operation & Maintenance |
| OHTs | - Over Head Tanks |
| UTs | - Union Territories |
| WSP | - Water and Sanitation Programme |

EXECUTIVE SUMMARY

The Ministry of Drinking Water and Sanitation (MDWS, GoI) has been making special efforts since the beginning of the Eleventh Five-Year Plan (2007-12) for covering the SC/ST-concentrated villages with a view to reducing the inequity in drinking water service delivery. The MDWS is carrying out this exercise to contribute to the 'inclusive growth' agenda of the Government of India. It's almost a decade now, since the beginning of inclusive policy in India.

The question this study attempts to answer is: To what extent the efforts of the MDWS have helped in narrowing down the service delivery gap, contributing to the inclusive service delivery policy of the government? This study has covered six Indian States, viz. Bihar, Jharkhand, Assam, Himachal Pradesh, Tamil Nadu and Uttarakhand covering 60 Gram Panchayats in 12 districts, involving 1200 respondents belong to SC/ST and non-SC/ST communities.

Major Findings of the Study

Availability: Frequency of water supply is an indicator of the availability of water to the communities. Majority of the households interviewed reported of getting water daily, although at unpredictable timings; and others get water at certain appointed hours daily. This holds good both for SC/ST communities as well as the non-SC/ST households. The rest get some days in a week (3-5 days or 1-2 days). Thus, it was found that the availability of drinking water to the SC/ST households is almost the same as that of the non-SC/ST households. We can infer to have achieved a satisfactory level of equity in terms of availability of water to SC/ST communities.

Distance: The condition with regard to distance travelled for fetching water for domestic use revealed that 5/6th of the non-SC households get water within 100-metre distance from their residence; whereas the majority of the SC households (3/6th of them) had to walk

anywhere between 500-1000 metres. Only about 1.3/6th of SC households get water within a distance of 100 metres. Most ST households in Assam get water within a distance of less than 500 metres. There are very few families that walk a distance of more than 1000 metres to fetch water for domestic use. Thus, the problem faced by a vast majority of households in SC-dominated habitations is not the availability of water but the distance they travel to fetch water. We can infer that inequity prevails in terms of distance travelled to fetch water.

Time Spent on Collecting Water: In Assam, Jharkhand and Uttarakhand, there is no question of taking water in less than 15 minutes. In all the States under this study, majority of the Non-SC households reported spending approximately 15-30 minutes, or a maximum of 45 minutes, whereas the majority of their SC/ST counterparts normally spend 45-60 minutes to collect water. We find that the SC communities walk a longer distance, and spend more time to fetch water compared to what their non-SC counterparts do. Although households from both the communities spend more time than they ought to, the number of households that walk longer distance is more in the case of SC communities. This spells inequity.

Quantity of Water: In the study states about 3/4th of the SC/ST habitations reported to have either basic access or less than basic access; whereas 3/4th of the non-SC/ST habitations have got optimal access. This is a clear case of inequity. However, neither in SC/ST habitations nor in non-SC/ST habitations, have people got more than 55 LPCD. In Assam – the only State where we could find the ST community representing the major portion of the population - it was found that they get less than 40 LPCD. Thus, the quantity of water people get was either just adequate or less than adequate and definitely not more, irrespective of caste categories. However, the fact that non-SC/ST communities get optimal access, whereas SC/ST communities get only basic access spells a clear case of inequity.

Quality of Water: Water quality test conducted in the study villages revealed that water in most of the villages is ‘good and potable’, except in two habitations in Tamil Nadu (one

CHAPTER - 1 INTRODUCTION

Inclusive Service Delivery

The Rural Water Supply (RWS) sector in India entered the fourth phase¹ in 2009 with major emphasis on ensuring the sustainability of water availability in terms of potability, adequacy, convenience, affordability and equity while also adopting a decentralised approach involving PRIs and community organisations. The overall physical coverage in rural areas – including piped water supply is over 90 per cent. The Annual Report 2016-17 of the Ministry of Drinking Water and Sanitation, Government of India reports that 77 per cent of the rural habitations have been fully covered ensuring 40 LPCD; and 55 per cent of the rural population has access to tap water. However, slippage is up to 15 per cent rendering the facilities unusable. In sanitation front, remarkable progress has been achieved bringing down the level of open defecation from 64 per cent (2014) to almost 2 per cent (March, 2019). Providing adequate quantity of safe water to all the citizens in a country of 1.23 billion population (2013), and changing the behaviour of nearly 7-10 per cent of the rural population, who despite having a toilet ‘still prefer doing it in the open’ are real challenges to rural development.

The Ministry of Drinking Water and Sanitation, Government of India works with the vision of providing ‘piped water supply’ to 90 per cent of the rural households before 2022. Annexure VIII of the Memorandum of Understanding between the State governments and the Department of Drinking Water Supply, Ministry of Rural Development, Government of India, reads (p.82):

‘Government investments in rural water supply and sanitation aim toadvance the nation towards universal access to protected and sustainable drinking water supply, the universal use of sanitary toilets and sound personal, home and community hygiene behavior’. ...[this shall include] coverage of all Government rural schools and Anganwadis where safe drinking water sources could not be provided under outlays allocated by the Department of School Education and

Literacy, Ministry of Human Resource Development or Central Finance Commission Funds.

To accelerate the assured availability of potable drinking water on a sustainable basis in SC and ST concentrated habitations, the States/UTs are required to earmark at least the percentage of the NRDWP funds for drinking water supply to the SC-concentrated habitations and ST-concentrated habitations as is communicated by the Ministry of Drinking Water and Sanitation based on the directions issued by the Government of India from time to time. One of the objectives of National Rural Drinking Water Programme (NRDWP) commenced in April 2009 is to ensure equity - a high priority in coverage/ investment habitations with high SCs/STs and minority population (MDWS, 2013).

While discussing ‘sustainable development,’ we tend to argue on ‘intergenerational equity’ in sharing of resources – that intergenerational inequity is ‘injustice caused by the current generation to the future generation’. We observe that there is intra-village inequity in sharing public provisioning of services that sections of the ‘current generation’ of the population are subjected to. This is in present time, experienced by the current generation, and it is not about the generation that we are about to have in the future. Secondly, funds have been allocated by the MDWS under the Eleventh Five-Year Plan to improve service levels exclusively in SC/ST habitations. It is quite obligatory that we need to assess the effect of the funds on the ground in terms of change in the standard of living of the target population.

Review of Literature

Inequitable distribution of water service delivery or disparity in service provision to rural and urban areas has been an issue of debate since long. However, the Eleventh Five-Year Plan (2007-2012) came out explicitly that ‘the issue of inequity’ should be addressed by putting to use strategies for ‘social inclusion’.

‘The Inclusive Growth: Vision and Strategy’ paper of the Eleventh Five-Year Plan (Planning Commission of India) reads:

.....these positive factors notwithstanding, a major weakness in the economy is that the growth is not perceived as being sufficiently inclusive for many groups, especially scheduled Castes (SCs), Scheduled Tribes (STs), and minorities. Gender inequality also remains a pervasive problem and some of the structural changes taking place have an adverse effect on women. The lack of inclusiveness is borne out by data on several dimensions of performance. Therefore ...while in the short run, access to basic facilities such as health, education, clean drinking water, etc., impacts directly on welfare, in the longer run, it determines economic opportunities for the future. Without access to these services, one cannot be considered to have equality of opportunity. Since access to these services for the majority of the population depends not only upon their income levels but upon the delivery of these services through publicly-funded systems, the Eleventh Plan's vision of poverty reduction includes major expansion in the supply of these services.

The Eleventh Five-Year Plan target for rural water supply was to 'provide clean drinking water for all by 2009 and ensure that there are no slip-backs by the end of the Eleventh Plan'(Vol.2: p.165). This is one of the monitorable targets of the Eleventh Five-Year Plan (Planning Commission of India, 2007). We are done with the Eleventh Five-Year Plan, and we are halfway through the Twelfth Five-Year Plan. It is high time we take up this issue and go for empirical verification of this question of 'inequity'.

Philip Keefer and Stuti Khemani, (Khemani, 2004) have analysed: 'why do the poor receive poor services?' They have studied the provision of basic human services to the poor, including educational service, and reach of subsidies. Their reasoning revolves around electoral commitments, political credibility and public policy. They have analysed this question from the standpoints of political competition; information available to the voters; and institutional reform, especially the decentralisation of service delivery. They argue that the explanation for the puzzle ['why do the poor receive poor services?'] lies in the lack of credibility of political promises to provide broad public goods, as opposed to private transfers and subsidies. As far as political competitors are concerned, issues of credibility

should hold top priority. Lack of credibility of political competitors is the most imposing obstacle to the reform of social service delivery or any State policy failure.

J Cyril Kanmony (Kanmony, 2003) studied the distribution pattern of drinking water supply schemes, and to what extent the disadvantaged group is provided with safe water in Kanyakumari district of Tamil Nadu. He has also made a good review of existing literature, although many of them as of now are more than two decades old. He cites Matzgar and Moench, who studied equity in water supply schemes at Gandhinagar, Gujarat in 1994, which found that many government officials used an average of 340 LPCD while in Miltonagar, a slum in Ahmedabad, the water available was only 7.5 LPCD. Further, villagers belonging to high castes received adequate quantities of water while people of lower castes received very little due to the social system prevailing in some villages. Even in the selection of a site for the installation of public stand posts, highly influential and rich persons dominated the project, which works to the benefit of rich people only. Abraham (1993) explained that water points are found in abundance in localities occupied by rich people, whereas such facilities were meagre in places where poor people lived.

Kanmony (2003), in his study conducted in the Kanyakumari district of Tamil Nadu, has found that rural people were discriminated against and deprived of their rights to enjoy basic services. He has thrown light on the discrimination using the break-up details of the sources of drinking water for the rich in comparison to the disadvantaged groups. The percentage of households which have safe water sources within their premises was only 4.32 in rural areas. Of these, 3.02 per cent of the households have tap connections and 1.30 per cent of the households have hand pumps. He established that only the rich people in rural areas have the privilege of protected water supply provided by civic bodies. At the end of his study, he has suggested (along with his other recommendations) that water schemes are not being equitably distributed to all areas; therefore, all proposed water schemes must be reviewed and implemented.

Bikash Chandra Dash (Dash, 2006) has studied the issue of equitable distribution of electricity as an essential service in rural areas. He has viewed it from the standpoints of

equity, and the existence of a positive correlation between energy use and development. He has used secondary data of rural electrification status and electricity subsidy availed by people in six states of India. He contends that those who have connected to electricity grid avail the subsidy component, while there are poorer people who have never been connected to any grid at all. The periodical tariff hike makes the poor remain away from being connected to any of the electricity grids. Such people remain in darkness. Therefore, the middle class households are the gainers from electricity subsidy, and not those undergoing abject poverty.

He points out that the frequent tariff increase is a result of poor metering, poor collection, poor billing, huge transmission and distribution (T&D) loss, theft and corruption. He views it as a matter of 'lack of good governance' which adversely affects the poor causing equity concerns in the sector. He suggests addressing the equity aspects of electricity distribution by proper targeting of subsidy as well as the improvements in the governance of the sector so as to ensure the reduction of T&D loss, cent per cent metering, higher collection and billing, controlling theft, and rapid service expansion of connectivity opportunity as the need of the hour.

Biksham Gujja and Hajara Shaik, (Biksham Gujja, 2005) in their commentary to EPW, raise an issue: 'when will India cover the 'uncovered'? Their question in detail is 'despite massive economic growth, one in every six persons in the world lacks drinking water.' A substantial percentage of this number is in India. Can the nation meet the challenge of providing drinking water to all by 2015? They have drawn their data from various sources, including various Five-Year Plan documents, Budgets, and Planning Commission of India reports. During the course of the discussion, the authors have brought in the question of competitive use of water for irrigation purposes; and the issues of how money and technology fail to solve water problem when policies do not look into some of broader issues of water management and mismanagement. \

The premise for their conclusion stems from: Going by just the figures in the five-year plans, all villages must by now have been covered twice over. Since it is unlikely that so

many villages have been newly set up in the country, it becomes clear that many once 'covered' habitations are slipping into the 'uncovered' category. They question: where are these 'uncovered' villages coming from'. There are 55,100 of them at present; how many more will there be next year? Is the number decreasing or increasing; what are our main constraints for providing drinking water to all when we lack neither money nor technology? They argue that the groundwater depletion caused by uncontrolled irrigation pumps makes the covered villages uncovered. They point out the mismanagement of water resources as the main problem. They conclude that the country is 'uncovering' villages faster than it plans to cover them, by not having a proper policy to allocate water for drinking purposes and water for irrigation purposes.

Indranil De (De, 2009) has captured in his study of six villages in Birbhum district of West Bengal the water supply services of the State machinery and the local governments, putting them side by side. He has collected evidences where the service is provided by (i) the State line department for water supply in West Bengal, i.e. Public Health Engineering Directorate (PHED), which is responsible for the installation of sources and also operation and maintenance (O&M); and (ii) places where the local governments are responsible for O&M of water supply services. He has compared the quality of service delivery: direct State delivery of service against the service provided by the local government. He has established that the quality of water service to be better in villages where the local government participates in O&M. He advocates that division of responsibilities according to the comparative advantage of local government and PHED yields better results. He concludes that decentralisation has a positive impact on the quality of water service delivery. The basic premise behind his argument is: the delivery of [public] services is expected to be better through decentralised institutions, which are close to the people.

Contrary to De's argument, Jean Dreze et al. (Sen, 2005) argues that decentralisation is not necessarily conducive to local democracy. In fact, in situations of sharp local inequalities, decentralisation sometimes heightens the concentration of power and discourages rather than fostering participation among the underprivileged. To illustrate, in

some tribal areas where upper-caste landlords and traders dominate village affairs, the devolution of power associated with the panchayat raj amendments has consolidated their hold and reinforced existing biases in the local power structure.

They also elaborate that local democracy is sometimes treated as synonymous with decentralisation', but the two are quite distinct. Micro-level case studies and survey evidence from India show that within-village inequality in education access and achievement is significant; with the privileged castes in the village enjoying near-literacy for several decades while literacy rates are still close to zero among disadvantaged castes in the village.

A case study described by the WSP (WSP, 2011) in their report titled: *Towards Drinking Water Security in India: Lessons from the field* has captured Dakshina Kannada, a coastal district in Karnataka bordering Kerala. It is situated on the western coast of India, which spreads from the Western Ghats to the Arabian Sea. The major part of its length lies along the seaboard. The population is about 1.3 million people (2001 census). The district is characterised by scattered habitations, isolated households, hilly terrain and saline water in the coastal belt in the summer months. In 2010, 128 of 203 GPs adopted meters for household connections coupled with volumetric-based tariff, and computerised billing and collection in Dakshina Kannada district. This is unique in rural India. In 2010, there were about 43,000 metered connections against less than 4,500 prior to the adoption of this practice.

Meters have successfully addressed the issue of unequal distribution of drinking water, misuse of water by advantage groups, constant complaints about inadequate supply of drinking water, non-payment of water tariff due to poor services and unbalanced budget leading to huge pending electricity bills and diversion of development funds towards the maintenance of schemes by the GPs. Meters have saved water and energy cost. Eventually, every household gets water supply and pays according to what it uses.

The reviewed studies bring a whole range of institutions and variables into play. They provide indicators that require exploration, and concepts that demand an explanation in the context of the study being proposed. It also draws our attention to the qualitative aspects of the concept of equity such as participation, deprivation, transparency and accountability of individuals and institutions. We found that some studies have attempted to find answers through technological solutions; others have attempted to pin down faith in community-based solutions; and so on. In the ultimate analysis, the literature reviewed gives us the directions to zoom in on, from the viewpoint of equitable distribution of water service delivery. It has helped us not only to sharpen the statement of the problem but also to prepare a matrix of concepts, indicators, variables and working definitions that go into making the conceptual framework for this study.

¹The Accelerated Rural Water Supply Programme (ARWSP) can be called as the first major initiative in drinking water and sanitation during the period 1972-1986. It aimed at ensuring provision of adequate drinking water supply to the rural community through the Public Health Engineering System. The second generation programme started with the launching of Technology Mission in 1986-87, renamed in 1991-92 as Rajiv Gandhi National Drinking Water Mission. Stress on water quality, appropriate technology intervention, human resource development support and other related activities were introduced in the rural water supply sector. The third generation programme started in 1999-2000 when sector reform projects were evolved to involve community in planning, implementation and management of drinking water related schemes, later scaled up as Swajaldhara in 2002. The RWS norms and guidelines needed to be flexible and broad-based for facilitating the community/VWSC for planning RWS projects based on the principle of demand responsive planning. Therefore, the ARWSP was modified in April, 2009 as the National Rural Drinking Water Programme (NRDWP). The Ministry of Drinking Water and Sanitation (then the Department of Drinking Water and Sanitation) views NRDWP as a movement towards ensuring people's drinking water security in rural India.

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CHAPTER – 2

RESEARCH DESIGN

Statement of the Problem

India has undoubtedly made some impressive gains from where it was at the time of its Independence. We have been able to fulfill our MDG commitments on drinking water; compare our performance to that of many countries, and the picture is convincing. However, the fact remains that more people in India lack adequate quantity of safe drinking water now than about 60 years ago (Biksham Gujja, 2005). It is stated often that people from the socially backward classes living in a cluster are not able to access water from the common water supply schemes located in the main village. In order to address this issue, the Ministry of Drinking Water and Sanitation requires the States and UTs to accord priority to the coverage of SC, ST, OBC and minority population dominated habitations. Accordingly, steps are taken year after year for coverage of all rural habitations with availability of adequate safe water to meet drinking, cooking and other domestic needs.

The Central outlay in the Eleventh Plan for the rural water supply sector was Rs. 39,211 crore. Besides this, all the State governments put together spent Rs.49,000 crore. Yet, at the beginning of the Twelfth Five-Year Plan, it is reported that there is a need for providing drinking water in 55,067 uncovered and about 3.31 lakh slipped back habitations. As per the prevailing situation, there are variations in the service levels even within habitations. As of 2012, the overall physical coverage in rural areas, including piped water supply, is reported to be over 90 per cent. Averages (at the country level, State level, district level or even at the village level) mask the reality pertaining to deprivations sections of the population undergo. There are problems of intra-village inequity in drinking water service delivery (Sahu, 2004).

The deprivation could stem from disadvantages associated with geographic location; levels of poverty and well-being; technology choice being advocated/chosen; deficiency of

information reach and so on. The intra-village variations generally affect the poor at the fringes or margins of villages, who usually turn out to be Scheduled Castes (SCs) or those who live in remote villages such as the Scheduled Tribes (STs). Another cause of this problem is that the rate of seepage loss increases with the increase in the length of pipeline from the place of the OHT to the tail end-residents. Thus, the residents in the tail-end reaches get much less water than those at the head-end. Ensuring equitable distribution of water, particularly in areas far away from pumping stations where pressure is low; and arresting water spillage during pipe bursts always remain a challenge. In practical sense, the issue of inequity in water service provision in rural areas has become very much common and normal; that it is unexciting, and goes unnoticed as an issue of injustice.

The gap between the richest and poorest in the use of drinking water sources differs significantly by region and country. However, in all developing regions, access to improved drinking water sources increases with wealth, and access to piped water on premises is much higher among the richest quintiles. In India, progress in access to improved drinking water sources has been equity neutral. Coverage levels have increased significantly across all quintiles. The majority of the richest quintile, however, continues to use piped water on premises, whereas an increasing number of the poorest rely on boreholes with hand pumps (UNICEF/WHO, 2011).

The WHO/UNICEF Joint Monitoring Committee (2012-13) has estimated and come out with possible disparity or inequity in the delivery of water supply and sanitation services. However, no exclusive study seems to exist to pin down empirically the extent of inequity or deprivation the poor undergo in water supply and sanitation services at the grassroots level. It does not always seem to be a matter of funds or technology choice. Rather, it could be very much associated with the nature of governance in place; or the local management system, including the socio-political factors at play. The big question is: Are the poor (those living below the official poverty line) and the SC/ST populations living in the study villages receive the water service delivery on equitable rates compared to those living in the main village? Secondly, what factors are at play in determining equitable distribution of water and sanitation services to the poor?

The Ministry of Drinking Water and Sanitation (MDWS, GoI) has been making special efforts since the beginning of the Eleventh Five year plan (2007-12) for covering the SC/ST-concentrated villages with a view to reducing the inequity such people undergo in drinking water service delivery. The MDWS is carrying out this exercise to be able to contribute to the ‘inclusive growth’ agenda of the government of India. It was made still more explicit after April 2009 through the National Rural Drinking Water Programme (NRDWP). It has been more than a full Five-Year Plan period we have crossed since then, again with similar emphasis in the Twelfth Five-Year Plan (2013-2017). Do all these efforts contribute to reduction in inequity and relative deprivation in drinking water service delivery the poor people undergo in Indian villages? Do these efforts and funds help narrow down the service delivery gap between the SC/ST habitations, vis-a-vis the habitations where the non-SC/STs reside? These question and associated issues require empirical investigation and practical explanation. Hence, this study is proposed.

Objectives

1. To assess the nature and extent of variation that exists in water service delivery among the SC-concentrated/ST-concentrated habitations in comparison to the non-SC/ST habitations in selected States
2. To identify the constraints and the factors that come into play in determining equitable distribution of water service to the poor
3. To explain and provide an understanding of what works; and what does not work (and why), in our efforts to reducing the inequity gap in water and sanitation services

Definitions

Equity: Equity by technical standards means getting regular access to a minimum of 55 lpcd safe water at a distance not more than 100 metres from one’s residence, and not having to wait for more than 30 minutes at the water collection point, if the source of water is a common water collection point. Equity in social terms explains relational satisfaction in terms of service delivery within the basic State services that the poor are entitled to. It is

about fair/unfair distribution of water service to the poor, SCs/STs living away from the main village, in relation to those better-off people living in the main village or near the pumping source/reservoir.

SC/ST-Concentrated Villages: Habitations in which more than 40 per cent of the population belongs to SCs are considered as SC-concentrated and with more than 40 per cent STs are considered as ST-concentrated. (MDWS, GOI, 2013)

BPL/APL: The local categories (Panchayat level data) are used where it was available. Where it is difficult to obtain, SECC-2011 data are used.

Service Delivery Levels: The prescriptions of MDWS (GoI) standards are to be used (such as 40 lpcd; protected water supply through piped on yard service for at least 35 per cent of the population, and for others to use shared facility; access within 100 metres from residence, etc. Refer to Rural Water Supply standards and norms (GoI).

| S. No | Parameters | Theoretical Definition | Operational Definition |
|-------|---|--|--|
| 1 | Availability of water | Frequency of getting water for domestic use | NRDWP guideline says 12 days in a two-week period). Either 24x7 or at appointed hours daily. |
| 2 | Distance travelled for collecting water | Distance one has to walk to fetch water for domestic use | 100 metres in plain areas 500 metres in hilly areas |
| 3 | Time spent for collecting water. In other words 'Queuing time'. | How much time one has to wait in queue for taking the quantity of water one is entitled to | 30 minutes or less as per the guidelines of NRDWP |
| 4 | Quantity of water | 'Adequate' quantity – 'Adequacy' of water supply | Basic access 40 lpcd Optimal access 55 lpcd Aspiration to get 70 lpcd |
| 5 | Quality of water | Safe water that is free from contamination - physical, chemical and bacteriological. | Based on the nine parameters that the WHO, (1996) has recommended. This study has taken into account TDS levels and household level treatment for ensuring freedom from bacteriological contamination. |

Hypotheses

The study mainly aimed at unearthing facts with reference to availability of water (frequency of supply), distance travelled to collect water (100 metres or more), time spent in collecting water (average), quantity of water (keeping 55 lpcd as standard), and the quality of water going by water safety standards. In order to get clear-cut revelations with regard to these parameters, the study has framed the following hypotheses. The hypotheses can be stated explicitly as follow.

Availability

H₀ - Availability of drinking water to the SC households is the same as that of the non-SC households

H₁ - Availability of drinking water to the SC/ST households is not the same as that of the non-SC households

Distance

H₀-The distance travelled by the SC/ST households to collect water is the same as that of the non-SC households

H₁ - The distance travelled by the SC/ST households to collect water is not the same as that of the non-SC households

Time Spent

H₀-The amount of time spent by SC/ST households to collect is the same as that of the non-SC households

H₁-The amount of time spent by SC/ST households to collect water is not the same as that of the non-SC households

Quantity

H₀-The quantity of drinking water supply that the SC/ST households get is the same as that of the non-SC households

H₁-The quantity of drinking water supply that the SC/ST households get is not the same as that of the non-SC households

Research Methods

The study adopted mixed methods research with a cross-sectional research design. The conceptual framework of this study is presented in the form of a matrix (Annex-1). Keeping ‘service delivery’ and ‘equity’ as outcome (dependent) variables, there were a host of determinants (independent variables) tested. They included source of water, type of facility, distance, quantity of water supply, quality, hours of supply and so on (See the Conceptual Framework presented as a matrix in Annex-1). We aimed at generating new knowledge that can explain the functional relationship between all the antecedents that cause the effect which we call equity/inequity in water service delivery.

Indicators of Interest

- Availability of water supply facilities
- Type of facility (piped water supply/common point water collection points/hand pump)
- Access to facilities (distance): within 100-metre radius
- Source of water
- Adequacy of supply - Quantity: Not less than 55 lpcd
- Safety of water (Quality: As per BIS standards)
- At least 30 per cent piped on premises or other improved sources
- At least 12 out of 14 consecutive days to have sufficient quantity
- Improved sanitation/shared facility (Availability of water)

Study Area

The data for this study have been collected from six Indian states, namely Bihar, Jharkhand, Assam, Himachal Pradesh, Tamil Nadu and Uttarakhand. When we ranked all the Indian States in descending order on the basis of ‘water service level coverage’, we have States with good service level at the top of the list and the ones with poor service level at the bottom. This ranking pertains to ‘coverage’ claims as reported by various State

governments to the MDWS. This is reported by the States, generally, from the type of facilities created in a given habitation, and it does not reflect the actual service delivery status. Actual service delivery was something we investigated through this study. Secondly, considering the time at our disposal, we selected three States from that come under high coverage States; and three States that lie at the bottom most. We picked up Bihar, Jharkhand and Assam from the bottom of the list, and Himachal Pradesh, Tamil Nadu and Uttarakhand from the top of the list. Secondly, from each of these States, we selected two districts and, in turn, two blocks. From these two blocks, finally we selected 10 villages (five villages in each block) for the purpose of this study. Selection of study population and sampling traits/sampling units, etc., were discussed under Sources of Data. In total, 60 GPs from six States were covered.

Sources of Data: The study used both primary and secondary sources of data. Primary data were collected from sampled BPL and APL families in selected Gram Panchayats in each State under study. The Ministry of Drinking Water and Sanitation has a robust website, where access to data on SC/ST concentrated habitation details can be drilled down to the level of block. From the block level data, we got at the Gram Panchayats, where SC/ST concentration is more. Our main sampling trait was poor SC/ST population from selected GPs in one stratum and non-SC/ST population in the same GP as another stratum. The sampling frame was the entire SC/ST population in the selected GPs. Going by the 'sample size calculator tool,' we determined the sampling fraction bearing in view maximum possible accuracy in our estimates of the population. Proportionate size of elements (sampling units) was selected from among the non-poor non-SC/ST population also using simple random technique for the purpose of comparison. The target population discussed was primarily SC/ST population. Secondary data were collected from the records available with the Village Panchayat Office, Block Development Office, the power pump operators, hand pump mechanics, etc., besides making use of chance encounters in the villages, and relevant websites.

Population Groups: Treatment Group: For the purpose of this study, habitations in which more than 40 per cent of the population belongs to SCs are considered as SC concentrated; and with more than 40 per cent STs are considered as ST concentrated. We considered this as our Treatment Group. For this study, we used a Comparison Group (or counterfeit comparison group) of non-SC households from the same or neighbourhood village, who subsist with similar standards of living in terms of common facilities; and economic status in terms of personal asset ownership.

Methods of Data Collection: The study put to use structured interview schedule covering all variables under study. In order to bring in multiple perspectives and to provide variety in data presentation, stories of success/failure were collected in the form of cases, and they are used for corroboration where required. Similarly, verbatim statements of people under study were also recorded, which in turn, have enriched the quality of report writing. In order to bring in these elements into reporting, the study necessarily used mixed methods research. Trained enumerators were involved in data collection.

Analytical Framework

The Analytical Framework is presented as a Matrix - 1. Data were analysed using SPSS version 20 and MS-Excel statistics. The study drew tools from both descriptive and inferential statistics. Tools such as Standard Deviation (SD), correlation coefficient, Regression Analysis, t-test, and Mann-Whitney U Test were used. The statistical tests were determined by taking cues from 'on-line research tools facility' provided by www.methods.sagepub.com.

In order to arrive at the difference in service delivery, different matching estimators (e.g. nearest neighbour matching, kernel matching, radius matching, etc.) could be applied. This study has used nearest neighbour matching. Finally, the difference in average values of a given outcome variable between the matched pairs of treatment and control communities were estimated to arrive at the differences that existed or the difference made by inclusive

Scope of the Study

- Keeping ‘service delivery’ and ‘equity’ as outcome (dependent) variables, a host of determinants (independent variables) were tested. They included source of water, type of facility, distance, quantity of water supply, quality, and hours of supply and so on. We aim at generating new knowledge that could explain the functional relationship between all the antecedents that caused the effect which we could address as equity/inequity in water service delivery. The results of this study may pin down the effect of inclusive service delivery in the selected States, it may or may not hold good for States not covered under this study. Elements of community participation in planning and decision-making with regard to drinking water service delivery at local level are not covered in this study, which is important area for further research. Similarly, drinking water in schools and anganwadi has not been covered. This study is about public provision by the Gram Panchayats and it does not take into account the individual households having drinking water facilities arranged privately. Again, this study is about drinking water, and not about water for other domestic purposes.

Validity

- **Internal Validity of Results:** The results can be spoken about with 95 per cent confidence level, and with 3 per cent error of margin.
- **External Validity of Results:** The results can be generalised to population of similar characteristics anywhere with the study States.

Chapter Scheme

Chapter - 1: Introduction

Chapter – 2: Research Design

Chapter - 3: Profile of the Study Area

Chapter - 4: Analysis & Discussion

Chapter - 5: Conclusions & Recommendations

References

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CHAPTER – 3

PROFILE OF THE STUDY AREA

This study has covered six Indian states, Bihar, Jharkhand, Assam, Himachal Pradesh, Tamil Nadu and Uttarakhand. When we ranked all the Indian States in descending order on the basis of ‘water service level coverage’, we have States with good service level at the top of the list and the ones with poor service level at the bottom. This ranking pertains to ‘coverage’ claims as reported by various State governments to the MDWS, and it’s regardless of the actual service delivery status. Actual service delivery was something we investigated through this study.

Secondly, considering the time at our disposal, we selected three States that come under high coverage States; and three that lie at the bottom of the list. We picked up Bihar, Jharkhand and Assam at the bottom most; and Himachal Pradesh, Tamil Nadu and Uttarakhand at the top of the list. Secondly, from each of these States, we selected two districts and, in turn two, blocks. From these two blocks, we selected 10 villages (five villages in each block) for the purpose of this study. Selection of study population and sampling traits/sampling units, etc., were discussed under Sources of Data. In total, 60 GPs from six States were covered. Table 1 below gives a matrix of States, districts and blocks visited for this study.

Table 1: States, Districts and Blocks Covered in this Study

| District | Block | State | | | | | | Total |
|--------------|----------------|------------|------------------|-------------|-------|-----------|-------|-------|
| | | Tamil Nadu | Himachal Pradesh | Uttarakhand | Bihar | Jharkhand | Assam | |
| Nagapattinam | Nagapattinam | 5 | | | | | | 5 |
| | Mayiladuthurai | 5 | | | | | | 5 |
| | Total | 10 | | | | | | 10 |
| Tiruvarur | Tiruvarur | 5 | | | | | | 5 |
| | Koradacherry | 5 | | | | | | 5 |
| | Total | 10 | | | | | | 10 |

Distributional Equity of Rural Drinking Water: A study on inclusive service delivery

| District | Block | State | | | | | | Total |
|----------|-------------|------------|------------------|-------------|-------|-----------|-------|-------|
| | | Tamil Nadu | Himachal Pradesh | Uttarakhand | Bihar | Jharkhand | Assam | |
| Solan | Dharampur | | 5 | | | | | 5 |
| | Solan | | 5 | | | | | 5 |
| | Total | | 10 | | | | | 10 |
| Sirmaur | Pachhad | | 5 | | | | | 5 |
| | Snagrah | | 5 | | | | | 5 |
| | Total | | 10 | | | | | 10 |
| Dehradun | Sahaspur | | | 5 | | | | 5 |
| | Vikasnagar | | | 5 | | | | 5 |
| | Total | | | 10 | | | | 10 |
| Haridwar | Bhagwanpur | | | 5 | | | | 5 |
| | Narsan | | | 5 | | | | 5 |
| | Total | | | 10 | | | | 10 |
| Gaya | Banke Bazar | | | | 5 | | | 5 |
| | Dumaria | | | | 5 | | | 5 |
| | Total | | | | 10 | | | 10 |
| Nawada | Sirdala | | | | 5 | | | 5 |
| | Akbarpur | | | | 5 | | | 5 |
| | Total | | | | 10 | | | 10 |
| Garhwa | Ramna | | | | | 5 | | 5 |
| | Bhawnathpur | | | | | 5 | | 5 |
| | Total | | | | | 10 | | 10 |
| Palamu | Hussainabad | | | | | 5 | | 5 |
| | Pipra | | | | | 5 | | 5 |
| | Total | | | | | 10 | | 10 |
| Baksha | Dhamdhama | | | | | | 5 | 5 |
| | Tamulpur | | | | | | 5 | 5 |
| | Total | | | | | | 10 | 10 |
| Udalguri | Kalagoan | | | | | | 5 | 5 |
| | Bhergaon | | | | | | 5 | 5 |
| | Total | | | | | | 10 | 10 |
| | Total | 20 | 20 | 20 | 20 | 20 | 20 | 120 |

This study primarily aims at identifying the service delivery gap between SC/ST communities on one side, and non-SC/ST communities in the same village or neighbourhood. Therefore, caste-wise classification, and interviewing respondents from different caste groups were found pertinent. Table 2 gives the number of respondents interviewed in both the groups.

Table 2: Caste Categories Covered

| S. No. | Caste Category | Number of Households | Percentage |
|--------------|----------------|----------------------|------------|
| 1 | SC | 501 | 41.8 |
| 2 | ST | 100 | 8.3 |
| 3 | OBC | 86 | 7.2 |
| 4 | Minorities | 2 | .2 |
| 5 | OC | 511 | 42.6 |
| Total | | 1200 | 100.0 |

Table 2 shows that almost equal number of respondents was interviewed in both the groups. Sample size was deliberately determined to be almost 50:50 so that voices from both the groups of respondents are equally heard, and reported.

Table 3: Occupation Details of the Respondents

| S.No. | Primary occupation | Number of Households | Percentage |
|--------------|----------------------------|----------------------|------------|
| 1 | Agriculture | 407 | 33.9 |
| 2 | Agricultural Wage earners | 556 | 46.3 |
| 3 | Livestock and small stocks | 46 | 3.8 |
| 4 | Employed in Government | 8 | .7 |
| 5 | Employed in Private Sector | 90 | 7.5 |
| 6 | Construction Workers | 35 | 2.9 |
| 7 | Petty Business owners | 25 | 2.1 |
| 8 | Others | 33 | 2.7 |
| Total | | 1200 | 100.0 |

Table 3 gives occupation details of the respondents. As in any typical Indian village, majority of the respondents in the study villages across States were either cultivators involved in agriculture (34 per cent), or agricultural wage earners (46 per cent). A good number of respondents in both SC/ST and non-SC/ST categories reported rearing livestock and small stock (4 per cent) as their primary source of income. There are others such as those employed in private sector (7.5 per cent), and other categories such as those employed in government, and other employed in construction works, or involved in running petty business were very negligible in number.

Table 4: Education Level

| Education Level | | Illiterate | | | Primary | | | Secondary | | | Senior Secondary | | | Graduation and Above | | | Total | | |
|-----------------|-------------|------------|----|---------|---------|----|---------|-----------|----|---------|------------------|----|---------|----------------------|----|---------|-------|-----|---------|
| | | SC | ST | Oth ers | SC | ST | Oth ers | SC | ST | Oth ers | SC | ST | Oth ers | SC | ST | Oth ers | SC | ST | Oth ers |
| St at es | TN | 16 | 0 | 8 | 22 | 0 | 29 | 51 | 0 | 38 | 5 | 0 | 16 | 6 | 0 | 9 | 100 | 0 | 100 |
| | HP | 22 | 0 | 5 | 55 | 0 | 49 | 19 | 0 | 39 | 3 | 0 | 5 | 1 | 0 | 2 | 100 | 0 | 100 |
| | U'k han d | 14 | 0 | 2 | 63 | 0 | 52 | 16 | 0 | 23 | 5 | 0 | 17 | 2 | 0 | 6 | 100 | 0 | 100 |
| | Bi-har | 32 | 0 | 17 | 69 | 0 | 75 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 101 | 0 | 99 |
| | Jha rkh and | 11 | 0 | 2 | 86 | 0 | 80 | 3 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| | As-sam | 0 | 10 | 5 | 0 | 87 | 80 | 0 | 3 | 13 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 100 | 100 |
| Total | | 95 | 10 | 39 | 295 | 87 | 365 | 86 | 3 | 138 | 13 | 0 | 40 | 8 | 0 | 17 | 501 | 100 | 599 |

Source: Primary Data.

Most of the respondents have had either primary or secondary level of education, irrespective of the caste category they were in. However, a major chunk has had only primary level of education, and very few have gone up to senior secondary or college levels. Although there were illiterates in all the categories, they were very few in number. Respondents from Bihar and Assam have had either primary level education or they are illiterates. They have not even attempted the secondary level education.

Table 5: Types of Houses

| Type of House | | Pucca | | | Kutchha | | | Thatched / huts | | | Total respondents | | |
|---------------|------------------|--------|--------|------------|---------|--------|-------------|-----------------|----|-------------|-------------------|-----|-------------|
| Caste | | S C | S T | Oth ers | SC | S T | Oth- ers | SC | ST | Oth- ers | sc | ST | Oth- ers |
| States | Tamil Nadu | 40 | 0 | 23 | 50 | 0 | 63 | 10 | 0 | 14 | 100 | 0 | 100 |
| | Himachal Pradesh | 0 | 0 | 0 | 74 | 0 | 98 | 26 | 0 | 2 | 100 | 0 | 100 |
| | Uttarakhand | 0 | 0 | 0 | 19 | 0 | 56 | 81 | 0 | 44 | 100 | 0 | 100 |
| | Bihar | 0 | 0 | 0 | 1 | 0 | 9 | 100 | 0 | 90 | 101 | 0 | 99 |
| | Jharkhand | 0 | 0 | 0 | 0 | 0 | 3 | 100 | 0 | 97 | 100 | 0 | 100 |
| | Assam | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 99 | 95 | 0 | 100 | 100 |
| Total | | 40 | 0 | 23 | 144 | 1 | 234 | 317 | 99 | 342 | 501 | 100 | 599 |

Source: Primary Data.

In terms of house ownership, most of the respondents of this study live in either *kutchha* or thatched huts. In Tamil Nadu, at least 40 scheduled caste respondents' families and 23 non-SC respondents of this study were found living in *pucca* houses. This is because of the Tamil Nadu State Government's Amma House Scheme, and Samathuvapuram scheme coupled with IAY scheme of the Ministry of Rural Development. *Kutchha* houses were more in Tamil Nadu, Himachal Pradesh and Uttarakhand, whereas huts were more in Bihar, Jharkhand and Assam. This communicates the relative poverty that prevails in these States.

Table 6: Availability of Toilet in the House

| Availability of toilet in house | | Yes (percentage) | | | | No (percentage) | | | | Total Respondents | | | |
|---------------------------------|------------------|------------------|----------|--------------|---------------|-----------------|-------------|--------------|---------------|-------------------|-------------|--------------|--------|
| | | Caste | SC | ST | Others | Total | SC | ST | Others | Total | SC | ST | Others |
| State | Tamil Nadu | 34 (17) | 0 (0) | 73 (36.5) | 107 (53.5) | 66 (33) | 0 (0) | 27 (13.5) | 93 (46.5) | 100 (50) | 0 (0) | 100 (50) | 200 |
| | Himachal Pradesh | 98 (49) | 0 (0) | 100 (50) | 198 (99) | 2 (1) | 0 (0) | 0 (0) | 2 (1) | 100 (50) | 0 (0) | 100 (50) | 200 |
| | Uttarakhand | 32 (16) | 0 (0) | 55 (27.5) | 87 (43.5) | 68 (34) | 0 (0) | 45 (22.5) | 113 (56.5) | 100 (50) | 0 (0) | 100 (50) | 200 |
| | Bihar | 0 (0) | 0 (0) | 3 (1.5) | 3 (1.5) | 101 (50.5) | 0 (0) | 96 (48) | 197 (98.5) | 101 (50.5) | 0 (0) | 99 (45.5) | 200 |
| | Jharkhand | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 100 (50) | 0 (0) | 100 (50) | 200 (100) | 100 (50) | 0 (0) | 100 (50) | 200 |
| | Assam | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 100 (50) | 100 (50) | 200 (100) | 0 (0) | 100 (50) | 100 (50) | 200 |
| Total | | 164 | 0 | 231 | 395 | 337 | 100 | 368 | 805 | 501 | 100 | 599 | 1200 |

Source: Primary Data.

As far as availability of toilets was concerned, it was found that none of the houses visited by the research team in the States of Bihar, Jharkhand and Assam owned toilets, which possibly means almost all of them go for open defecation only. Himachal Pradesh is one State where almost 99 per cent of the respondents owned toilets. In Tamil Nadu, 53 per cent of the respondents owned toilets. In Uttarakhand, 56 per cent did not own toilet, and the remaining owned toilets, and reported to be using them.

CHAPTER – 4

ANALYSIS & DISCUSSION

Inclusive Growth Agenda

The Ministry of Drinking Water and Sanitation (MDWS, GoI) has been making special efforts since the beginning of the Eleventh Five-Year Plan (2007-12) for covering the SC/ST-concentrated villages with a view to reducing the inequity in drinking water service delivery. The MDWS is carrying out this exercise to contribute to the ‘inclusive growth’ agenda of the Government of India.

At the Central level, 22 per cent of NRDWP funds are earmarked for Scheduled Caste Sub-Plan and 10 per cent for Tribal Sub-Plan to be utilised for provision of drinking water supply to SC/ ST-concentrated habitations. States and District Panchayats are provided with sufficient powers and flexibility to allocate funds exclusively for non-covered habitations of SCs and STs. States that need more resources for coverage of SCs and STs should earmark more of their resources for coverage.

GOAL: Ensure equitable and adequate quantity of safe drinking water to all rural households, schools and anganwadis by paying special attention to SC/ST concentrated areas that suffer from inequitable drinking water supply.

1. Reduce the inequity and relative deprivation in drinking water service delivery experienced by the poor and the SC/ST population.
2. Ensure that the rural schools and child care centres (anganwadis) in SC/ST-concentrated areas own water and sanitation services that are really functional
3. The MDWS has made it a crucial element in the NRDW Programme in order to contribute to the ‘inclusive growth’ agenda of the Government of India.
4. Attempt measuring the extent to which the efforts of the MDWS have helped narrow down the service delivery gap

5. Whether it has enabled the SC households get access to drinking water services on par with national drinking water supply norms?

The Big Question

1. What is the causal effect of *inclusive service delivery policy* on SC-concentrated habitations with specific reference to *rural drinking water service delivery*?

Objectives

1. To examine if inclusive service delivery efforts in water & sanitation sector contribute to reduction in inequity and relative deprivation in drinking water service delivery the SC/ST population undergo.
2. Identify to what extent the efforts of the MDWS have helped in narrowing down the service delivery gap.

Policy Relevance

- The MDWS has made it a crucial element in the NRDW Programme in order to contribute to the 'inclusive growth' agenda of the Government of India.
- This study attempts measuring the extent to which the efforts of the MDWS have helped in narrowing down the service delivery gap;
- Whether it has enabled the SC households get access to drinking water services on par with national drinking water supply norms?

Hypotheses

Availability (Frequency of supply)

Distance (100 metres)

Time Spent (mean)

Quantity (55 lpcd)

Quality (Safety)

Availability

H₀ - Availability of drinking water to the SC households is the same as that of the non-SC households

H₁ - Availability of drinking water to the SC households is not the same as that of the non-SC households

Distance

H₀-The distance travelled by the SC households to collect water is the same as that of the non-SC households

H₁ - The distance travelled by the SC households to collect water is not the same as that of the non-SC households

Time Spent

H₀-The amount of time spent by SC households to collect is the same as that of the non-SC households

H₁-The amount of time spent by SC households to collect water is not the same as that of the non-SC households

Quantity

H₀-The quantity of drinking water supply that the SC households get is the same as that of the non-SC households

H₁-The quantity of drinking water supply that the SC households get is not the same as that of the non-SC households

Quantity of Water Supply

The NRDWP Guidelines 2013 states that from the Twelfth Five-Year Plan, the focus has shifted to provision of piped water supply. The vision for rural domestic water supply in the strategic plan of the Ministry is to cover all rural households with safe piped drinking water supply @ 70 lpcd. Considering the fact that the norm of 40 lpcd has been continuing for the last four decades and there is a large population that has to be provided with higher service levels, as an interim measure, the norm is 55 litres per capita per day (lpcd) for humans to meet the following requirements:

Distributional Equity of Rural Drinking Water: A study on inclusive service delivery

| Purpose | Quantity (lpcd) |
|--------------------------------|-----------------|
| Drinking | 3 lpcd |
| Cooking | 5 |
| Bathing | 15 |
| Washing Utensils | 10 |
| Ablution/Toilets | 10 |
| Washing clothes and other uses | 12 |
| Total | 55 lpcd |

Table 1: Quantity of water collection vs Caste categories

| Quantity of water collection | 20 to 40 litres (percentage) | | | 40 to 55 litres (percentage) | | | 55 to 70 litres (percentage) | | | Total Respondent (percentage) | | | | |
|------------------------------|------------------------------|-----------|------------|------------------------------|----------|------------|------------------------------|----------|----------|-------------------------------|------------|------------|-------------|-----------|
| | Caste | SC | ST | Oth-ers | SC | ST | Oth-ers | SC | ST | Oth-ers | SC | ST | Oth-ers | To-tal |
| S t a t e s | Tamil Nadu | 4 (2) | 0 (0) | 7 (3.5) | 96 (48) | 0 (0) | 88 (44) | 0 (0) | 0 (0) | 5 (2.5) | 100 (50) | 0 (0) | 100 (50) | 200 (100) |
| | Hima-chal Pradesh | 94 (47) | 0 (0) | 48 (29) | 6 (3) | 0 (0) | 52 (26) | 0 (0) | 0 (0) | 0 (0) | 100 (50) | 0 (0) | 100 (50) | 200 (100) |
| | Utta-rakhand | 64 (32) | 0 (0) | 55 (27.5) | 36 (18) | 0 (0) | 45 (22.5) | 0 (0) | 0 (0) | 0 (0) | 100 (50) | 0 (0) | 100 (50) | 200 (100) |
| | Bihar | 99 (49.5) | 0 (0) | 3 (1.5) | 2 (1) | 0 (0) | 96 (48) | 0 (0) | 0 (0) | 0 (0) | 101 (50.1) | 0 (0) | 99 (49.5) | 200 (100) |
| | Jhar-khand | 97 (48.5) | 0 (0) | 0 (0) | 3 (1.5) | 0 (0) | 100 (50) | 0 (0) | 0 (0) | 0 (0) | 100 (50.0) | 0 | 100 (50) | 200 (100) |
| | Assam | 0 (0) | 99 (49.5) | 43 (21.5) | 0 (0) | 1 (0.5) | 57 (28.5) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 100 | 100 (50) | 200 (100) |
| Total | 358 | 99 | 156 | 143 | 1 | 438 | 0 | 0 | 5 | 501 | 100 | 599 | 1200 | |

Source: Primary Data.

Distributional Equity of Rural Drinking Water: A study on inclusive service delivery

For rural areas, drinking water supply norms of 40 lpcd is considered as the Basic Access; and 55 lpcd is considered as the Optimal Access. The NRDWP recommends to the States to aspire for giving 70 lpcd by 2022. In the study States, about 3/4th of the SC/ST habitations reported to have either basic access or less than basic access; whereas 3/4th of the non-SC/ST habitations have got optimal access. Neither in SC/ST habitations nor in non-SC/ST habitations, have people got more than 55 lpcd. In Assam – the only State where we could find ST community representing the major portion of the population – it was found that they get less than 40 lpcd. Thus, the quantity of water people get was either just adequate or less than adequate, and definitely not more, irrespective of caste categories.

| Time spend for collecting water | | | Caste Category | | | Total |
|---------------------------------|-------|------------------|----------------|-----|--------|-------|
| | | | SC | ST | Others | |
| Less than 15 minutes | State | Tamil Nadu | 19 | 0 | 23 | 42 |
| | | Himachal Pradesh | 5 | 0 | 5 | 10 |
| | | Bihar | 0 | 0 | 1 | 1 |
| | Total | | 24 | 0 | 29 | 53 |
| 15 to 30 minutes | State | Tamil Nadu | 11 | 0 | 11 | 22 |
| | | Himachal Pradesh | 26 | 0 | 54 | 80 |
| | | Uttarakhand | 0 | 0 | 28 | 28 |
| | | Bihar | 3 | 0 | 82 | 85 |
| | | Jharkhand | 3 | 0 | 90 | 93 |
| | | Assam | 0 | 1 | 97 | 98 |
| Total | | 43 | 1 | 362 | 406 | |
| 30 to 45 minutes | State | Tamil Nadu | 38 | 0 | 35 | 73 |
| | | Himachal Pradesh | 31 | 0 | 35 | 66 |
| | | Uttarakhand | 17 | 0 | 66 | 83 |
| | | Bihar | 0 | 0 | 15 | 15 |
| | | Jharkhand | 0 | 0 | 9 | 9 |
| | | Assam | 0 | 0 | 1 | 1 |
| Total | | 86 | 0 | 161 | 247 | |

Distributional Equity of Rural Drinking Water: A study on inclusive service delivery

| Time spend for collecting water | | | Caste Category | | | Total |
|---------------------------------|--------------|------------------|----------------|-----------|------------|-------|
| | | | SC | ST | Others | |
| 45 to 60 minutes | State | Tamil Nadu | 20 | 0 | 14 | 34 |
| | | Himachal Pradesh | 38 | 0 | 6 | 44 |
| | | Uttarakhand | 82 | 0 | 6 | 88 |
| | | Bihar | 83 | 0 | 1 | 84 |
| | | Jharkhand | 96 | 0 | 1 | 97 |
| | | Assam | 0 | 99 | 2 | 101 |
| | Total | 319 | 99 | 30 | 448 | |
| More than 60 minutes | State | Tamil Nadu | 12 | 0 | 17 | 29 |
| | | Uttarakhand | 1 | 0 | 0 | 1 |
| | | Bihar | 15 | 0 | 0 | 15 |
| | | Jharkhand | 1 | 0 | 0 | 1 |
| | Total | 29 | 0 | 17 | 46 | |
| Total Respondents | State | Tamil Nadu | 100 | 0 | 100 | 200 |
| | | Himachal Pradesh | 100 | 0 | 100 | 200 |
| | | Uttarakhand | 100 | 0 | 100 | 200 |
| | | Bihar | 101 | 0 | 99 | 200 |
| | | Jharkhand | 100 | 100 | 100 | 200 |
| | | Assam | 0 | 100 | 599 | 1200 |

Source: Primary Data.

Comparability coverage means provision within a distance of 100 metres from the household or 30 minutes of time taken for fetching water in a day. In Assam, Jharkhand, and Uttarakhand, there is no question of taking water in less than 15 minutes. In all the States under this study, majority of the non-SC households reported spending 15-30 minutes, or at the maximum 45 minutes. Whereas majority of their SC/ST counterparts spend 45-60 minutes to collect water. If we take a look at it in comparison with the previous table, we find that the SC communities spend more time to fetch less water compared to what their non-SC counterparts spend. A few respondents in the SC/ST and

non-SC categories reported spending more than one hour daily for water collection other than Himachal Pradesh and Assam.

Distance Norms

As per the NRDWP norms, water must be made available within 100 metres in plain terrains, and within 500 metres in hilly terrains. The current study examined the distance people from different communities travel to fetch water for domestic use.

Table 3: Distance between Hamlet and Water Source Point

| Distance of Hamlet from water source point | | Less than 100 metres | | | 100 to 500 metres (per cent) | | | Greater than 500 metres and less than 1000 metres (per cent) | | | More than 1000 metres (per cent) | | | Total |
|--|--------------------------|----------------------|----------|--------------|------------------------------|-----------|--------------|--|-----------|------------|----------------------------------|----------|---------|-------|
| | | SC | ST | Oth-ers | SC | ST | Oth-ers | SC | ST | Oth-ers | SC | ST | Oth-ers | |
| St at es | Tamil Nadu | 65 (32.5) | 0 (0) | 71 (35.5) | 13 (6.5) | 0 (0) | 11 (5.5) | 16 (8) | 0 (0) | 12 (6) | 6 (3) | 0 (0) | 6 (3) | 200 |
| | Hima- chal Pradesh | 32 (16) | 0 (0) | 95 (47.5) | 50 (25) | 0 (0) | 4 (2) | 18 (9) | 0 (0) | 1 (0.5) | 0 (0) | 0 (0) | 0 (0) | 200 |
| | Uttarak- hand | 27 (13.5) | 0 (0) | 64 (32) | 5 (2.5) | 0 (0) | 29 (14.5) | 68 (34) | 0 (0) | 7 (3.7) | 0 (0) | 0 (0) | 0 (0) | 200 |
| | Bihar | 2 (1) | 0 (0) | 76 (38) | 0 (0) | 0 (0) | 22 (11) | 85 (42.5) | 0 (0) | 1 (0.5) | 14 (7) | 0 (0) | 0 (0) | 200 |
| | Jhar- khand | 3 (1.5) | 0 (0) | 95 (47.5) | 0 (0) | 0 (0) | 5 (2.5) | 97 (48.5) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 200 |
| | Assam | 0 (0) | 0 (0) | 98 (49) | 0 (0) | 37 (0) | 1 (0.5) | 0 (0) | 63 (0) | 1 (0.5) | 0 (0) | 0 (0) | 0 (0) | 200 |
| Total | | 129 | 0 | 499 | 68 | 37 | 72 | 284 | 63 | 22 | 20 | 0 | 6 | 1200 |

Source: Primary Data.

The condition with regard to distance travelled for drinking water revealed that 5/6th of the non-SC households get water within a distance of 100 metres from their residence; whereas majority of the SC households (3/6th of them) had to walk anywhere between 500-1000 metres. Only about 1.3/6th of SC households get water within a distance of 100 metres. Most of the ST households in Assam get water within a distance of less than 500 metres. Very few families walk a distance of more than 1000 metres to fetch drinking water.

Frequency of water supply

NRDWP norms state that water must be made available to the communities at least 12 days in a two-week period. This is the frequency that States and Gram Panchayats must strive for.

Table 4: Frequency of Water Supply

| Frequency of water collection | Daily but at unpredictable times (24 hours) | | | Daily at certain hours | | | Three to five days in a week | | | One to two days in a week | | | |
|-------------------------------|---|-----|-----|------------------------|----|-----|------------------------------|----|----|---------------------------|----|----|---------|
| | Caste | SC | ST | Oth-ers | SC | ST | Oth-ers | SC | ST | Oth-ers | SC | ST | Oth-ers |
| States | Tamil Nadu | 40 | 0 | 39 | 60 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 3 |
| | Himachal Pradesh | 1 | 0 | 3 | 81 | 0 | 80 | 5 | 0 | 4 | 13 | 0 | 13 |
| | Uttarakhand | 1 | 0 | 1 | 94 | 0 | 94 | 5 | 0 | 5 | 0 | 0 | 0 |
| | Bihar | 101 | 0 | 96 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Jharkhand | 100 | 0 | 92 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Assam | 0 | 99 | 91 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 243 | 99 | 322 | 235 | 1 | 252 | 10 | 0 | 9 | 13 | 0 | 16 | |

Source: Primary Data.

Frequency of water supply is an indicator of availability of water to the communities. Majority (about 45 per cent) of the households interviewed reported getting water daily, but at unpredictable timings, and others (45 per cent) get water at certain appointed hours daily. The rest (about 10 per cent) get some days in a week (3-5 days in a week or 1-2 days a week). For a vast majority, availability of water is not a problem whereas the distance they travel to fetch water and the time they spend for fetching are concerns. These issues are more prevalent in SC-dominated habitations.

Parameters of Potability - Safe Drinking Water

Water is defined as safe if it is free from biological contamination (guinea worm, cholera, typhoid, etc.) and within permissible limits of chemical contamination (excess fluoride, brackishness, iron, arsenic, nitrates, etc.) as per IS-10500 standard of BIS.

TDS is Total Dissolved Solids. The dissolved minerals in water are commonly referred to as Total Dissolved Solids (TDS). There are particular standards for the acceptable amounts of these elements (minerals) in water. Leaving aside the specific harmful chemicals fluoride and arsenic, drinking water for human beings should contain some level of minerals (TDS), but these levels should not be excessive. Household level/community level Reverse Osmosis (RO) is a commonly used filtration system that removes the dissolved impurities in water. RO is required if the Total Dissolved Solids (TDS) exceed a certain value.

Table 5: Quality of Water (based on TDS Level)

| State | TDS Levels in Drinking Water | | | | | | | | Total |
|------------------|--------------------------------|-----------|------------------------------------|-----------|---------------------------------|-----------|--|-----------|---------------|
| | Good: 50-600 mg/l (percentage) | | Average: 600-900 mg/l (percentage) | | Bad: 900-1200 mg/l (percentage) | | Unacceptable: above 1200 mg/l (percentage) | | |
| | SC/ST | Non-SC/ST | SC/ST | Non-SC/ST | SC/ST | Non-SC/ST | SC/ST | Non-SC/ST | |
| Tamil Nadu | 4 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 10 GPs |
| Himachal Pradesh | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 GPs |
| Uttarakhand | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 GPs |
| Bihar | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 GPs |
| Jharkhand | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 GPs |
| Assam | 6 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 10 GPs |
| Total | 30 | 24 | 5 | 1 | 0 | 0 | 0 | 0 | 60 GPs |

Source: Primary Data; Standards as per WHO, Guidelines for Drinking Water Quality, 1996.

Quality of water is an important parameter taken up. This communicates about the potability of drinking water, primarily in relation to the TDS level in water. Above indicators of four categories, i.e. Good, Average, Bad and Unacceptable, are based on WHO water quality standards: The scale used is as follows: Excellent: 50 to 300 mg/l, Good: 300-600 mg/l, Fair: 600-900 mg/l, Poor: 900-1200 mg/l, Unacceptable: above 1200 mg/l. Water, with extremely low concentration of TDS, may also be unacceptable because of its flat, insipid taste.

Water quality test conducted in the study villages (using a TDS Digital Water Quality Tester Pen) revealed that the quality of water in most of the villages is good and potable, except in two habitations in Tamil Nadu (one SC/ST habitation and the other in non-SC/ST habitation) where the source of water was found 'Average' (TDS level between 600-900 mg/l), and similarly, four sources in Assam were found to be at 'average' (600-900 mg/l). The water quality reports produced by the Gram Panchayats revealed that the PH level was also found in the range of 5 to 8 only on a PH Scale of 0-14, which means the water is either neutral or slightly acidic or slightly alkaline. These are but within the acceptable levels as per the quality norms of WHO, 1996.

MANN - WHITNEY U TEST

Mann-Whitney U Test is a non-parametric statistical test (distribution-free test) in which we can test whether two independent groups are significantly different from each other or not. The two groups in our study are SC/ST (Group 1) and non-SC/ST (Group 2). We tested the variables of interest using suitable hypothesis. The complete Mann-Whitney test procedures and the results we got for the hypotheses tested are given below.

Hypothesis 1 on 'Availability of Water'

H₀: Availability of drinking water to the SC/ST households is the *same* as that of the non- SC/ST households.

H₁: Availability of drinking water to the SC/ST households is *different* from that of the non-SC/ST households.

RANKS

| | Caste category | N | Mean Rank | Sum of Ranks |
|--------------------------------|----------------|------|-----------|--------------|
| Availability of Drinking Water | SC/ST | 601 | 609.61 | 366373.00 |
| | Non SC/ST | 599 | 591.36 | 354227.00 |
| | Total | 1200 | | |

Availability of drinking water shows small difference in mean ranks between SC/ST and non- SC/ST categories. Numerically, people belonging to SC/ST categories seem to be able to access water daily at certain hours (of course, they need to walk a distance) slightly more than that of non-SC/ST categories.

TEST STATISTICS

| | Availability of drinking water |
|-------------------------|--------------------------------|
| Mann- Whitney U | 174527.00 |
| Wilcoxon W | 354227.00 |
| Z | -1.044 |
| Assymp. Sig. (2-tailed) | 0.296 |

Since p-value is greater than 0.05 (0.296), we accept the null hypothesis.

Result: Availability of drinking water to the SC/ST households is almost the same as that of the non-SC/ST households.

Hypothesis 2 on 'Distance travelled for collecting water'

H₀: Distance travelled by the SC/ST households is the *same* as that of the non-SC/ST households.

H₁: Distance travelled by the SC/ST households is *different* from that of the non-SC/ST households.

RANKS

| | Caste category | N | Mean Rank | Sum of Ranks |
|--------------------|----------------|------|-----------|--------------|
| Distance Travelled | SC/ST | 601 | 785.71 | 472214.50 |
| | Non-SC/ST | 599 | 414.67 | 248385.50 |
| | Total | 1200 | | |

The distance travelled by SC/ST people for collecting water is more compared to non-SC/STs.

TEST STATISTICS

| | Distance Travelled |
|-------------------------|--------------------|
| Mann-Whitney U | 68685.500 |
| Wilcoxon W | 248385.500 |
| Z | -21.437 |
| Assymp. Sig. (2-tailed) | 0.000 |

Since p-value is less than 0.05 (0.000), we reject the null hypothesis.

Result: Distance travelled by the SC/ST households is *different* (more) from that of the non-SC/ST households.

Hypothesis 3 on 'Time Spent for Collecting Water'

H₀: The duration of time spent by the SC/ST households is the *same* as that of the non- SC/ST households.

H₁: The duration of time spent by the SC/ST households is *different* from that of the non- SC/ST households.

RANKS

| | Caste category | N | Mean Rank | Sum of Ranks |
|---------------------------------|----------------|------|-----------|--------------|
| Time spent for collecting water | SC/ST | 601 | 808.96 | 486184.50 |
| | Non-SC/ST | 599 | 391.34 | 234415.50 |
| | Total | 1200 | | |

The time spent by the SC/ST people for collecting water is more compared to Non-SC/STs.

TEST STATISTICS

| | Time spent for collecting water |
|-------------------------|---------------------------------|
| Mann-Whitney U | 54715.500 |
| Wilcoxon W | 234415.500 |
| Z | -22.001 |
| Assymp. Sig. (2-tailed) | 0.000 |

Since p-value is less than 0.05 (0.000), we reject the null hypothesis.

Result: The time spent by the SC/ST households for collecting water is *different* (more) from that of the non-SC/ST households.

Hypothesis 4 on ‘Quantity of drinking water collected’

H₀: The quantity of drinking water received by SC/ST households is the *same* as that of the non-SC/ST households.

H₁: The Quantity of drinking water received by the SC/ST households is *different* from that of the non-SC/ST households.

RANKS

| | Caste category | N | Mean Rank | Sum of Ranks |
|-------------------------------------|----------------|------|-----------|--------------|
| Quantity of drinking water received | SC/ST | 601 | 450.52 | 270763.00 |
| | Non-SC/ST | 599 | 750.98 | 449837.00 |
| | Total | 1200 | | |

On comparison, the SC/ST people are receiving less quantity of drinking water than non-SC/ST people.

TEST STATISTICS

| | Quantity of drinking water received |
|-------------------------|-------------------------------------|
| Mann-Whitney U | 89862.000 |
| Wilcoxon W | 270763.000 |
| Z | -17.330 |
| Assymp. Sig. (2-tailed) | 0.000 |

Since p-value is less than 0.05 (0.000), we reject the null hypothesis.

Result: The quantity of drinking water received by the SC/ST households is *different* (less) from that of the non-SC/ST households.

CHAPTER – 5

FINDINGS, CONCLUSIONS AND FURTHER RESEARCH

Background

The Ministry of Drinking Water and Sanitation (MDWS, GoI) has been making special efforts since the beginning of the Eleventh Five-Year Plan (2007-12) for covering the SC/ST-concentrated villages with a view to reducing the inequity in drinking water service delivery. The MDWS is carrying out this exercise to contribute to the ‘inclusive growth’ agenda of the Government of India. It was made still more explicit after April, 2009 through the National Rural Drinking Water Programme (NRDWP). Again, a similar emphasis was made in the Twelfth Five-Year Plan (2013-2017) reiterating the need for addressing the issue of inequity in drinking water service delivery between SC/ST-concentrated villages, and those where non-SC/ST communities reside. Special fund allocations are made for this purpose, and the MDWS has created a separate MIS system in order to monitor the progress being made in this regard.

It has been almost a decade now since the beginning of inclusive policy in India. Has it delivered in rural domestic water sector? Do all the efforts of the MDWS contribute to a reduction in inequity and relative deprivation in drinking water service delivery the poor people undergo in Indian villages? In other words, to what extent the efforts of the MDWS have helped narrow down the service delivery gap, contributing to the inclusive service delivery policy of the government? These questions required empirical investigation and factual explanation. This study set out in order to find out if the after-effects of the inclusive policy agenda and special fund allocations for SC/ST habitations reflect in drinking water service delivery, in other words, whether it has worked to bridge the inequity gap by effecting noticeable improvements on major parameters of domestic water service delivery in rural areas. Hence, this study was undertaken.

This study was conducted in six States of India covering 60 Gram Panchayats in 12

districts, involving 1200 respondents belong to SC/ST and non-SC/ST communities in almost equal numbers. This can be considered as a quasi-experiment, in the sense, it is an empirical study carried out in order to estimate the causal impact of inclusive service delivery policy on SC/ST communities. The outcome observed whether the inequity in domestic water service delivery has been addressed or not. That is causal effect of intervention on its target population (without random assignment). Hence, it can be considered as a quasi-experimental design. The parameters considered, along with theoretical and operational definitions, are given below:

| | Parameters | Theoretical Definition | Operational Definition |
|---|---|--|--|
| 1 | Availability of water | Frequency of getting water for domestic use | NRDWP guideline says 12 days in a two-week period. Either 24x7 or at appointed hours daily. |
| 2 | Distance travelled for collecting water | Distance one has to walk to fetch water for domestic use | 100 metres in plain areas 500 metres in hilly areas |
| 3 | Time spent for collecting water. In other words 'Queuing time'. | How much time one has to wait in queue for taking the quantity of water one is entitled to | 30 minutes or less as per the guidelines of NRDWP. |
| 4 | Quantity of water | 'Adequate' quantity – 'Adequacy' of water supply | Basic Access 40 lpcd Optimal Access 55 lpcd Aspiration to get 70 lpcd |
| 5 | Quality of water | Safe water that is free from contamination - physical, chemical and bacteriological | Based on 9 parameters that the WHO (1996) has recommended. This study has taken into account TDS levels and household level treatment for ensuring freedom from bacteriological contamination. |

Major Findings of the Study

Availability: Availability is about frequency. Frequency of water supply is an indicator of availability of water to the communities. Majority (about 45 per cent) of the households interviewed reported of getting water daily, although at unpredictable timings; and others (45 per cent) get water at certain appointed hours daily. This holds good both for SC/ST communities as well as the non-SC/ST households. The rest (about 10 per cent) get some days in a week (3-5 days or 1-2 days a week). Thus, it was found that availability of drinking

water to the SC/ST households is almost the same as that of the non-SC/ST households. We can infer to have achieved a satisfactory level of equity in terms of availability of water to SC/ST communities.

Distance: The condition with regard to distance travelled for fetching water for domestic use revealed that 5/6th of the non-SC households get water within a distance of 100 metres from their residence, whereas majority of the SC households (3/6th of them) had to walk anywhere between 500-1000 metres. Only about 1.3/6th of SC households get water within a distance of 100 metres. Most of the ST households in Assam get water within a distance of less than 500 metres. There are very few families that walk a distance of more than 1000 metres to fetch water for domestic use. Thus, for a vast majority of households in SC-dominated habitations, availability of water is not a problem, whereas distance they travel to fetch water is an issue. We can infer that inequity prevails in terms of distance travelled to fetch water.

Time Spent for Collecting Water: In Assam, Jharkhand, and Uttarakhand, there is no question of taking water in less than 15 minutes. In all the States under this study, majority of the non-SC households reported spending more or less 15-30 minutes, or a maximum of 45 minutes, whereas majority of their SC/ST counterparts normally spend 45-60 minutes to collect water. We find that the SC communities walk longer distance and spend more time to fetch water compared to their non-SC counterparts. A few respondents in the SC/ST and non-SC categories reported spending more than one hour daily for water collection, with some exceptions at Himachal Pradesh and Assam. Although households from both the communities spend more time than they ought to, the number of households that walk longer distance is more in the case of SC communities. This spells inequity.

Quantity of Water: The study states that about 3/4th of the SC/ST habitations reported to have either basic access or less than basic access; whereas 3/4th of the Non-SC/ST habitations have got optimal access. This is a clear case of inequity. However, neither in SC/ST habitations nor in non-SC/ST habitations, have people got more than 55 lpcd. In

Assam – the only State where we could find majority ST community – it was found that they get less than 40 lpcd. Thus, the quantity of water people get was either just adequate or less than adequate, and definitely not more, irrespective of caste categories. However, the fact that non-SC/ST communities get optimal access, whereas SC/ST communities get only basic access spells a clear case of inequity.

Quality of Water: Water quality test conducted in the study villages revealed that water in most of the villages is ‘good and potable’, except in two habitations in Tamil Nadu (one SC/ST habitation and the other a non-SC/ST habitation). The PH level was also found in the range of 5 to 8 on a PH Scale of 0 to 14, which means the water is either neutral or slightly acidic or slightly alkaline. In two of the Tamil Nadu villages, water quality tests revealed that the water being used (in two habitations) was contained ‘Average levels of TDS’ (between 600-900 mg/l). Similarly, four sources in Assam were found to be at ‘average’ (600-900 mg/l). However, water with TDS levels more than 1200 mg/l or PH at extremes in a scale of 0-14 are only considered unacceptable for human consumption. The TDS and PH levels reported in all the study villages were found to be ‘within the acceptable levels,’ irrespective of community groups, as per the quality norms of WHO, 1996.

Conclusion

This study concludes that equity has been achieved in terms of (i) availability and (ii) quality of water service delivered to the SC/ST communities. However, going by other essential parameters such as (iii) distance travelled, (iv) time spent, and (v) quantity of water delivered, inequity persists. The SC/ST communities still remain underserved.

Suggestions for Further Research

This study has established with clear evidences that the issue of inequity (between SC/ST habitations and non-SC/ST habitations in the realm of rural domestic water service delivery) has not been addressed to the extent desired. There are evidences that clearly put

across that inequity still prevailing extensively in all the six study States. This study did not go into analysing *why it did not happen as expected or why inequity could not be addressed*. What are the local socio-political, participation and governance related factors that could possibly play roles for the slow progress we notice in addressing inequity? This could be one important area for further research.

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