Journal of Rural Development, Vol. 31, No. (3) pp. 287 - 304
NIRD, Hyderabad.

DRINKING WATER AND SANITATION IN RURAL MADHYA PRADESH : ISSUES AND CHALLENGES FOR POLICY

*Keshab Das**

ABSTRACT

This paper presents a brief account, based primarily on available secondary sources, of the current status of drinking water supply and sanitation in rural Madhya Pradesh. With a discussion on the lopsided hydrogeological attributes of water availability and shortages, a regional analysis of issues of access, quality of water and sustainability has been attempted. A brief discussion on the poor sanitation coverage of rural households in the State has been attempted. In addition to the State's role in enhancing the availability of water resources (through rainwater harvesting, for instance), a particularly disturbing aspect of unreliable database concerning water and sanitation sector has been underscored.

Introduction

Since the observance of the International Drinking Water Supply and Sanitation Decade (IDWSSD) during 1981-90, there has been a growing awareness about and concern over the poor access to these basic services in most of rural India. So far as water for drinking and domestic purposes is concerned, conventional emphasis has been on the availability, quality and sustainability of freshwater. The major and persisting reasons for the crisis have been identified as the excessive demand for water coming up from a large, growing and often urban population; depletion of groundwater levels due to mindless exploitation of the resource; contamination, pollution or spoiling water bodies including aquifers; mismanaging waste water disposal; neglect of protecting and/or promoting water harvesting systems; and poor policy and its implementation.

A particularly disturbing aspect of state intervention in the drinking water sector has been the presentation and compilation of

* Professor, Gujarat Institute of Development Research, Ahmedabad 380 060.
Email: *keshabdas@gmail.com*

* This paper is a substantially revised and updated version of a short study undertaken under the WaterAid (India) sponsored project on integrated water resource management (IWRM) for the Forum for Watershed Research Policy Dialogue (ForWaRD). Thanks are due to both the organisations for their support and excellent inputs as the study progressed. At a later stage, some important data were provided kindly by two resource persons from Madhya Pradesh - Asad Umar of WaterAid (India) and Rahul Banerjee of Dhas Gramin Vikas Kendra. For valuable comments and suggestions, Amita Shah, K.J. Joy, A.J. James and Tara Nair deserve thanks. Neha Panchal and Gani Memon had provided crucial research support for this study and are specially thanked for the same. Comments from an anonymous referee and earnest pursuance by the Editorial Office at NIRD, all contributed to preparing the final draft. The author remains responsible for all shortcomings that might still remain.

utterly unrealistic and unreliable database on the nature and extent of coverage of rural habitations, which showed surprisingly almost-total achievements contrary to field reality. In fact, much before the current concern by the government over what it terms as 'slippage' of coverage status, detailed critique of the problematic classification and serious flaws in the official statistics on the status of water availability in habitations have been provided in Das (2001) and also in Das and Kumar (1996 and 1997).

A much more disappointing scenario was that of rural sanitation which continued to remain in the sphere of inaction for decades. In fact, even between the data in *Census of India 2001* and *Census of India 2011*, the proportion of households having access to some form of sanitation has risen from 22 to 30.9 per cent. During the World Summit on Sustainable Development, one of the Millennium Development Goals had been set to reduce the uncovered population by 50 per cent by the year 2015. India, nevertheless, declared to achieve the goal by 2007 and the government launched the Total Sanitation Campaign (TSC) in 1999. The TSC, forming part of the sectoral reforms process, was restructured from the earlier Central Rural Sanitation Programme (CRSP), launched in 1986, which failed to make much headway.

Even as the rural drinking water supply and sanitation provisioning are activities that come under the 'State Subjects', both have been supported in the states through what are called Centrally sponsored schemes (CSS). Despite the Central guidelines, such schemes carry the vestiges of state administration and local political culture and, hence, it is often the nature of functioning of these schemes (alongside individual state's own efforts) that determine the performance and achievement of the sub-sector. It is an irony that whereas Central government figures would indicate a near-complete coverage, particularly, in case of rural drinking water supply, individual state situation could be most disappointing. Similarly, state level analysis of the status and progress of these basic services can bring out a range of issues that would provide important clues for policy intervention.

It is with this broad context that this paper attempts to review, from a policy perspective, the status and performance of rural drinking water supply and sanitation in Madhya Pradesh mainly during the last decade or so. In so doing, it identifies issues related to water availability, quality, sustainability and role of state agencies in addressing these. Similarly, though briefly, it looks into the status of sanitation in the State and discusses factors responsible for the poor coverage. Suggestions have been made underscoring the need to ensure sustainability in the provisioning and usage of drinking water and sanitation in rural Madhya Pradesh. The paper is based solely on available secondary data, literature review and discussions with concerned officials and functionaries from both government and civil society organisations; no village surveys have been undertaken for the study.

Economic and Hydrogeological Dimensions of Madhya Pradesh

Even as the total population of Madhya Pradesh has increased by about a quarter (24.34 per cent) between the 2001 and 2011 Census decade, about three-fourths of the State population continue to live in rural areas. Agriculture contributes around 46 per cent of State income and remains the main source of occupation in the State with about 80 per cent of the workforce directly engaged in this.[1] The predominantly rural and agrarian economy is one of India's poorest states with 42 per cent of its rural population subsisting below poverty line as per the latest (2009-10) estimates[2].

With a large land mass and relatively low population density in the State, the rural

habitations are sparsely located. The carving out of the new State of Chhattisgarh from Madhya Pradesh in 2000 brought down its number of districts to 45 from the original 61. However, subsequently, the number has risen to 50 with five new districts formed by bifurcating as many districts. The National Sample Survey Office (NSSO) has grouped the 50 districts under six NSS Regions as shown in Table 1.

Table 1 : NSS Region-wise Distribution of Districts in Madhya Pradesh

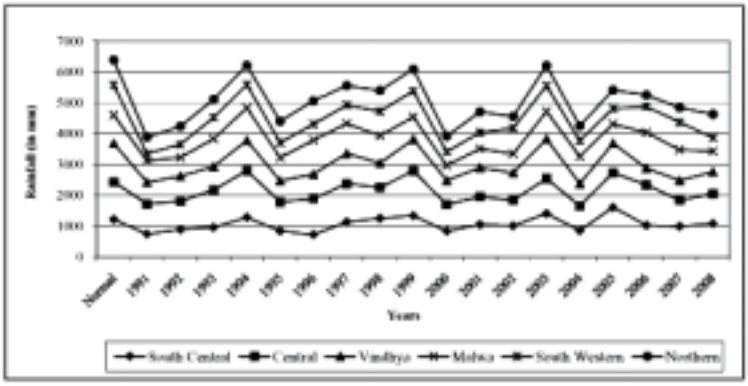
NSS Region	Name of the Districts
Vindhya	Chhatarpur, Panna, Tikamgarh, Rewa, Satna, Shahdol (includes *Anooppur*), Umariya, Sidhi (includes *Singrauli*)
South Central	Jabalpur, Katni, Narsinghpur, Balaghat, Mandla, Dindori, Seoni, Chhindwara
Central	Bhopal, Raisen, Sehore, Vidisha, Sagar, Damoh
South Western	Betul, Hosangabad, Harda, Khandwa (includes *Burhanpur*), Khargone, Badwani
Malwa	Rajgarh, Indore, Dhar, Jhabua (includes *Alirajpur*), Ujjain, Ratlam, Mandsaur, Neemch, Dewas, Shajapur
Northern	Gwalior, Datia, Guna (includes *Ashoknagar*), Shivpuri, Morena, Sheopur, Bhind

Source : http://www.mospi.gov.in/nsso_4aug2008/web/nsso/fod/fod_home/nss_regions.pdf

Note : New districts are mentioned in brackets with districts from where these have been formed.

The distinct variations in topography and hydrogeology in the State have resulted in different rainfall and climatic regimes. Whereas the river Narmada flows between the Satpura range in the central region, a number of northerly flowing rivers cut across the Malwa plateau in the west and the Bundelkhand region. The rainfall can largely be attributed

Figure 1: District-wise Normal and Yearly Average Rainfall, 1991-2008 (In Millimetres)



Sources : Up to 2003, Commissioner, Land Records and Settlements, Gwalior, Madhya Pradesh and for the later period, http://www.imd.gov.in/section/hydro/distrainfall/districtrain.html (Accessed on March 4, 2012 at http://www.indiawaterportal.org/node/7185) and the Fertiliser Association of India.

to the south-west monsoon, which accounts for about 90 per cent of total rains in the State. Figure 1 represents the major differentials in rainfall across the NSS Regions as between 1991 and 2008; the rainfall ranges between a low of 23.2 cm in the south-western region in 1991 and high of 160.5 cm in the south-central region in 2005. Further, low rainfall (less than 75 per cent of the normal in 20 per cent of the years under consideration) had been responsible for drought-like situations in the south-western, Vindhya and northern regions over the 18-year period. This has implications for the availability of drinking water in a major way.

Status of Rural Water Supply

With five major rivers the Ganga, Godavari, Narmada, Mahi and Tapi flowing through the State, it is a paradox of sorts that the drinking water needs are almost entirely (about 99 per cent) met through groundwater extraction (Khanna and Khanna, 2005). An increasing use of handpumps and tubewells clearly points to the over-exploitation of groundwater in many parts of the State. As is shown in Table 2, over the last three census decades, the proportion of rural households depending upon handpumps/tubewells as the primary and dominant source of drinking water has risen sharply, from above one-third in 1991 to over half in 2001 and about two-thirds by 2011. That this phenomenon has been exerting pressure on the groundwater stock of the State is commonly known. In fact, as a study (Scott and IDC, 2005) had observed, the fast depletion of groundwater level has resulted in a situation, whereby the groundwater status in half the districts of the State had been classified as 'semi-critical', 'critical and 'over-exploited'.

Table 2 : Distribution of Rural Households by Source of Drinking Water, Madhya Pradesh

Source/Year	1991	2001	2011
Tap	11.4	10.7	9.9
Handpump/tubewell	34.2	50.9	63.2
Well	47.3	35.6	25
Tank	0.7	-	-
River,Canal	4.2	-	-
Other	2.2	2.9	1.9

Source : Government of India (1997 and 2003) and Drinkingwater-censusdata2011.pdf

As shown in Table 3, between 2005 and 2011, in 13 districts the proportion of handpumps affected by low groundwater level has been above 10 per cent. The districts most affected are Ratlam, Rajgarh, Mandsaur, Khandwa, Ujjain, Dewas and Neemuch.

In terms of coverage by public safe sources of drinking water, the State level figures of FC (fully covered), PC (partially covered) and NC (not covered) rural habitations have not been encouraging.[3] As shown in Figure 2, the share of FC habitations has been fluctuating and by 2011 there has been a decline in the proportion of FC habitations and a major rise in that of the PC habitations.

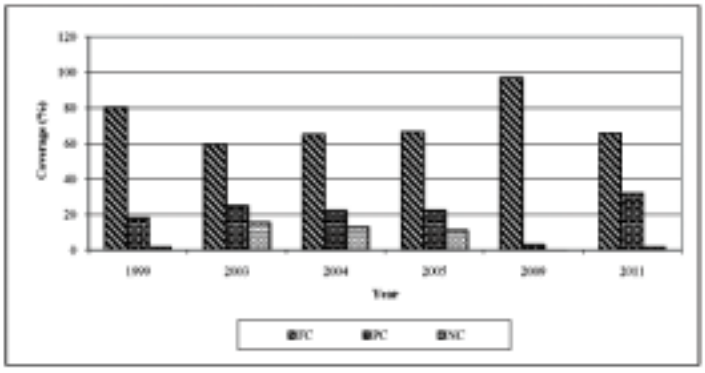
Table 3 : Rise in Incidence of Handpumps Affected by Low Groundwater Level in Rural Madhya Pradesh, 2005 and 2011

District	Handpumps with low water level (percentage)			
	2005		2011	
	January	June	January	June
Ratlam	22.92	6.43	21.48	34.97
Rajgarh	4.30	4.30	14.60	30.55
Mandsaur	25.49	18.16	21.91	28.43
Khandwa	4.96	4.96	4.08	25.90
Ujjain	19.40	12.44	10.41	25.89
Dewas	8.76	8.76	8.19	23.45
Neemuch	16.76	16.76	10.71	22.53
Dhar	7.62	5.67	4.96	17.73
Bhopal	3.65	3.65	6.03	16.44
Khargone	6.84	6.48	5.34	15.41
Shajapur	7.20	7.20	5.93	13.91
Sagar	5.97	5.97	3.24	13.53
Sheopur	9.32	9.32	6.31	10.03

Sources: For 2005, PHED, Bhopal and http://www.mpphed.org/pipwater.asp and for 2011, http://indiawater.gov.in/IMISReports/NRDWPDistrictMain.aspx?IState=017&StName=MADHYAPRADESH

Note: Districts with less than 10 per cent of handpumps affected by low groundwater level in June 2011 are not included here.

Figure 2: Coverage of Habitations in Rural Madhya Pradesh, 1999-2011



Source: PHED, Bhopal and *Census of India, 2011*.

At a further disaggregated district level, the coverage status of rural habitations presents a complex picture. Interestingly, as shown in Table 4, the districts having less than 50 per cent of FC habitations in 2005 do not figure at all in the list of such districts in 2011. Districts with low incidence (less than 50 per cent) of FC habitations include Betul, Barwani, Panna, Mandla, Dindori and Seoni.

Table 4 : Water Supply Coverage in Rural Madhya Pradesh, 2005 and 2011

District	2005				2011			
	Total Habita-tions	FC (%)	PC (%)	NC (%)	Total Habita-tions	FC (%)	PC (%)	NC (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bhopal	747	67.34	32.40	0.27	721	85.85	14.15	0
Raisen	1969	61.50	34.94	3.56	1979	78.48	18.44	2.08
Sehore	1271	80.49	14.48	5.04	1270	62.99	31.18	5.83
Rajgarh*	2418	48.10	42.64	9.26	2385	75.72	19.75	4.53
Vidisha	2058	62.73	34.50	2.77	2049	86.92	12.54	0.54
Betul**	2546	57.19	27.65	15.16	2557	47.67	50.29	2.04
Hoshangabad	1347	95.99	1.41	2.60	1356	62.46	37.54	0
Harda	889	75.93	17.21	6.86	906	92.27	7.73	0
Indore*	1073	45.01	54.05	0.93	1065	86.57	13.43	0
Khandwa#	1469	56.84	40.10	3.06	1530	76.21	23.79	0
Dhar	6322	67.59	20.67	11.74	6685	62.93	25.70	0
Jhabua#	9372	65.14	20.41	14.45	4642	70.51	26.14	3.35
Khargone	4046	64.71	18.91	16.39	4052	84.97	14.56	0.47
Barwani**	5382	69.83	18.90	11.28	5432	44.33	55.67	0
Ujjain*	1489	43.32	48.02	8.66	1489	88.52	11.01	0.47
Ratlam*	1638	32.72	62.45	4.82	1632	54.47	38.60	6.93
Mandsaur*	1236	41.50	49.19	9.30	1230	66.67	30.16	3.17
Neemuch*	1189	33.31	54.67	12.03	1097	81.22	13.67	5.11
Dewas	1513	51.29	36.88	11.83	1599	86.74	13.01	0.25
Shajapur*	1092	27.84	68.68	3.48	1093	75.75	23.79	0.46
Gwalior	1192	64.26	34.06	1.68	1189	80.66	19.34	0
Datia	1079	54.87	13.99	31.14	1085	93.18	6.82	0
Guna#	3980	69.35	23.19	7.46	2616	86.48	13.52	0

(Contd.)

Table 4 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Shivpuri	2116	69.61	22.92	7.47	2225	76.58	23.42	0
Morena	3958	71.53	11.50	16.98	3829	95.27	4.44	0.29
Sheopur	917	61.29	30.10	8.62	919	74.65	24.81	0.54
Bhind	1887	76.95	17.22	5.83	1803	97.62	1.39	0.99
Sagar*	2230	47.22	44.17	8.61	2238	55.50	44.41	0.09
Chhatarpur	1964	75.56	14.92	9.52	1972	67.60	32.40	0
Panna**	1758	60.52	26.51	12.97	1773	48.05	51.95	0
Tikamgarh	2017	63.51	15.96	20.53	2090	89.71	10.29	0
Damoh	1450	82.00	12.34	5.66	1496	66.58	33.42	0
Jabalpur	1685	75.79	19.47	4.75	1744	88.02	11.98	0
Katni	1510	72.32	18.81	8.87	1622	70.41	29.59	0
Narsinghpur	2151	79.87	3.21	16.92	2148	52.42	47.58	0
Balaghat	3770	83.74	9.12	7.14	3719	63.03	36.76	0.21
Mandla**	3860	66.99	19.87	13.13	3873	41.23	50.74	8.03
Dindori**	3818	56.34	28.97	14.69	4070	45.04	53.88	1.08
Seoni**	2586	72.47	24.48	3.05	2540	44.17	41.69	14.14
Chhindwara	4482	73.67	18.09	8.23	4579	56.43	37.63	5.94
Rewa	8531	78.16	6.59	15.25	8515	57.96	41.46	0.58
Satna	5044	63.46	27.30	9.24	5049	60.98	39.02	0
Shahdol#	6117	76.15	8.24	15.61	4015	56.26	43.74	0
Umaria	1914	64.84	4.34	30.83	1841	53.94	46.06	0
Sidhi#	7090	64.87	26.93	8.21	3558	58.11	41.89	0
Total	126172	66.49	22.39	11.12	127197	65.96	32.00	2.04

Sources : PHED, Bhopal, 2005 and for 2011 sourced at

http://indiawater.gov.in/IMISReports/NRD WPDistrict Main.aspx? IState=017& StName= MADHYAPRADESH

Notes : # New districts formed are Burhanpur from Khandwa, Alirajpur from Jhabua, Ashoknagar from Guna, Anooppur from Shahdol and Singrauli from Sidhi.

* 8 Districts with less than 50 per cent FC habitations in 2005.

** Districts with less than 50 per cent FC habitations in 2011.

The problems of data notwithstanding, Table 5 suggests the severity of drinking water crisis in the rural regions of the State. Between 1999-2005 and 2005-2011, there has been a rise in the number of districts in the latter period where more than 600 rural habitations have slipped from their previously held FC status. Jhabua, Shahdol, Sidhi, Rewa and Barwani are some of the worst-hit districts in terms of the major decline in HC habitations.

Table 5 : Districts with Decrease in the Number of FC Habitations, 1999-2011

Decrease in FC habitations	Districts	
	1999-2005	2005-2011
> 600	Jhabua (3507), Dhar (1538), Khanda (1086), Rajgarh (919)	Jhabua (2886), Shahdol (2452), Sidhi (2434), Rewa (1733), Barwani (1350), Balaghat (813), Mandla (989), Seoni (752), Chhindwara (718)
500-600	Shajapur, Sagar, Seoni	Narsingpur (592)
400-500	Ratlam, Shahdol	Hoshangabad (446), Guna (460)
300-400	Ujjain, Shivpuri, Jabalpur, Umaria	Dindori (318)
200-300	Raisen, Vidisha, Betul, Indore, Mandsaur, Neemuch, Panna	Sehore (223), Betul (237), Panna (212), Umaria (248)

Source : For 1999-2005, sourced at http://www.mp.nic.in/des/scmp2000/scmpT141.htm and for 2005-2011, sourced at http://www.ddws.nic.in/online_monitor.htm (Accessed on June 14, 2011).

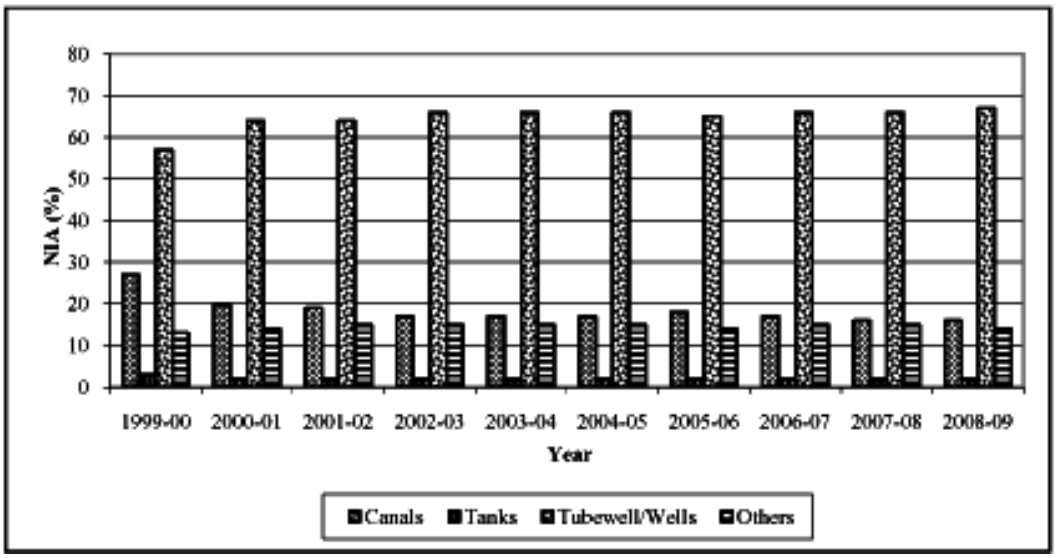
Note : Figures in parentheses indicate number of habitations where the decrease has been identified.

It is unfortunate that such classification exercises as undertaken on a routine basis are intrinsically flawed and, hence, grossly misleading. The problems with such categorisation as FC, PC and NC have been discussed at length in Das (2001). Importantly, these figures could change substantially depending upon the period of the year when such a survey is undertaken. There is ample evidence to suggest the 'slippage' of the status of habitations between FC, PC and NC is an easily observable phenomenon. These figures also fail to capture the facts responsible for a certain status of coverage by water supply.

Over-exploitation of Groundwater : Excessive dependence upon groundwater as the primary source of potable water in the State has threatened the sustainability of the existing sources. As mentioned earlier, across the three Census periods as 1991, 2001 and 2011, there has been a significant increase in the proportion of rural households for whom the main source of drinking water remains handpumps and tubewells. In fact, as per *Census of India 2011* data, there has been a significant rise during the last decade in the districts with above 70 per cent of rural households depending upon handpumps/ tubewells/ borewells for their drinking water need; these are *Sheopur*, Morena, Bhind, Gwalior, Datia, Satna, Rewa, *Ujjain*, Dewas, *Indore*, Vidisha, *Bhopal*, Raisen, Katni, *Jabalpur*, *Narasinghpur*, Ashoknagar, *Jhabua* and *Alirajpur*.[4] Almost as a double whammy, even in the sphere of irrigation, tubewells and wells

account for the predominant source of water for farming. Most of this decade, close to 70 per cent of net irrigated area had been covered by these two groundwater-based sources (Figure 3). In fact, during the previous decade, for instance, between 1992-93 and 1998-99, these specific sources accounted for just around 40 per cent; the substantial rise and sustained high level of dependence on groundwater sources during the last decade signals the crisis facing the drinking water sector in the State. That there is a need to explore enhancing irrigation through tapping surface water sources, promoting water recharge activities and efficiently managing water resources has been highlighted in the recent State development report (Planning Commission, 2011: 93).

Figure 3 : Net Irrigated Area by Source, Madhya Pradesh, 1999-2009



Source : Commissioner, Land Records and Settlements, Gwalior, Madhya Pradesh.

A closer look at the groundwater level and development further corroborates the growing challenge of water availability facing rural Madhya Pradesh. As per the latest information provided by the Central Ground Water Board (CGWB), the State has 48 blocks (of the total 459) classified as 'semi-critical', 'critical and 'over-exploited', concentrated in the south-western part of the State[5]. Further, a comparison of figures on average water level (the unit expressed as metres below ground level or m bgl) across districts reveal that in as many as 32 districts the average water level has risen between 2005 and 2009, the latest year for which data are available. Further, in six districts (Bhopal, Sehore, Katni, Satna, Umaria and Sidhi) the increase has been over 2m bgl[6]. The over-exploitation of groundwater poses serious challenges for future availability of the resource, also due to the fact that at least 21 districts, mainly in the Malwa, south-central and Vindhya areas the groundwater recharge rate is very low as these come under the basaltic region.

Water Quality and Health Related Issues : The pressure on sources of drinking water in the State has gone up not just because of

irregular rainfall and over-extraction of groundwater, but due to the growing incidence of contamination of water due to the excess presence of chemicals in it. There have been reports of water being affected in several districts as the content of fluoride, nitrate, salinity and even iron content has been found to be above the prescribed norms. Table 6 enlists districts by specific water quality problem and points to the substantial rise in the number of districts affected by fluoride contamination and excess iron in the groundwater. There appears to be a decline in the spread of high nitrate content in the previously-affected districts. Surveys by the State health department had also expressed concern over growing cases of fluoride and water-borne diseases in most parts of the State; these find resonance in the profile of water quality in the State conducted by the Central Ground Water Board (http://cgwb.gov.in/gw_profiles/st_MP.htm).

Table 6 : Districts Affected by Water Quality Problems in Madhya Pradesh

Water quality problems	Districts	
	2005	2011
Fluoride contamination	Jabalpur, Jhabua, Shivpuri, Dhar, Seoni, Shajapur and Chhindwara	Dhar (795), Seoni (409), Chhindwara (382), Mandla (355), Jhabua (341), Rajgarh (156), Sehore (115), Ratlam (96), Betul (71), Raisen (47), Dindori (29), Khargone (29), Alirajpur (27), Vidisha (16), Shajapur (11), Sagar (10), Neemuch, Sheopur (5), Ujjain (44), Balaghat (3)
High nitrate content in groundwater	Chhindwara, Sagar, Sheopur, Shivpuri, Vidisha and Rajgarh	Dhar (6)
High salinity	Bhind district in general and in localised areas in Shajapur, Sagar, Ratlam, Ujjain, Chhatarpur and Sheopur	Rewa (88), Neemuch (87), Mandsaur (54), Bhind (34), Ratlam (33), Ujjain (32), Dewas (10), Sehore (9), Raisen (2)
Iron content in the groundwater	Shahdol, Umaria, Sehore	Sehore (41), Chhindwara (18), Seoni (15), Raisen (10), Neemuch (6), Balaghat (4), Indore (2)

Source: For 2005, PHED, Bhopal and for 2011, http://indiawater.gov.in/IMISReports/NRDWPDistrictMain.aspx?IState=017&StName=MADHYAPRADESH

Human-made factors are also equally responsible for the deteriorating water quality. Contamination of water occurs due to poor construction and maintenance of handpumps, open defecation practice, washing of clothes or bathing near water sources and increasing use of fertilisers in the farms. Awareness regarding health impacts of poor quality of water is missing among the villagers; for them the taste and colour of water are almost the sole criteria for deciding on its quality. Poor infrastructure for water quality testing has further accentuated the situation. Due importance requires to be given to quality aspects while addressing the coverage part.

Institutional and Governance Deficit : Lack of proper inter-departmental coordination and communication as between those dealing with drinking water and sanitation, irrigation, water resources management and health, etc. has given rise to dysfunctionality in managing water supply for rural areas. Projects have also suffered due to disruption in the fund flows caused due to stoppages at various hierarchical levels. A holistic approach to water supply seems to be missing, which, consequently, has reduced the overall efficiency of the concerned state apparatus.

Studies indicate that schemes designed and executed by the engineering departments tend to overlook problems specific to a particular source, region and their hydrological or topographical aspects (Agarwal *et al*., 2001: 298). This is so as most of the activities are often target based and not concerned with the performance *after* implementation. The need for revising the existing approach focusing on follow-up monitoring and local specificities cannot be overstated.

A specific problem relating to the water supply schemes remains the functional ambiguity that has encouraged divided attention by the department. The coexistence of both the supply-driven schemes as, for instance, the Accelerated Rural Water Supply Programme (ARWSP) and the *Swajaldhara* (the demand-driven programme introduced in 2002) represents such lack of clarity at the implementation level. The departmental capacity for promoting information, education and communication (IEC) activities was lacking. As a result, villagers were not made aware in advance about the purpose of the demand driven programme (or approach) and were not convinced about their participatory role and the need to make financial contribution towards the new scheme. In short, they felt alienated from the *Swajaldhara* programme. This implied that the basic purpose of community participation was lost. The communication and information gap between the policymaker and the end users continues.

Moreover, drinking water resources management is not covered by any formal policy or legal framework in Madhya Pradesh (Scott Wilson and IDC, 2005: 34). There is no control over external factors affecting water supply sources reflecting a gross neglect of quality and maintenance aspects. Renewed emphasis on sustained policy efforts towards the revival and/or modernisation of traditional water harvesting structures is an essentiality if future demand has to be addressed. Broad-basing watershed infrastructure in the State needs no underscoring.

A glaring case in governance deficit is exemplified through the manner in which the Swajaldhara scheme has been managed in the State. Even as recent data are yet to be made available, the financial and physical performance during the first five years indicates a substantial amount of funds remaining unutilised in the depository accounts. Whereas less than a quarter of total funds was spent during the period 2002-07, less than half the schemes taken up could actually be completed (Table 7).

Table 7 : Financial Progress of *Swajaldhara* Scheme in Madhya Pradesh, 2002-07

(₹ lakh)

Year	Allocation	Released				Physical and Financial		
		1st Instal-ment	2nd Instal-ment	EC/start up/ Admin.	Total	Expenditure	Schemes taken up	Schemes completed
2002-03	529.01	264.49	264.46	346.28	875.23	462.73 (52.87)	83	64 (77.11)
2003-04	840.54	420.27	255.76	42.03	718.06	208.28 (29.01)	364	241 (66.21)
2004-05	966.49	724.54	129.00	144.97	998.51	109.55 (10.97)	170	51 (30.00)
2005-06	2696.24	1650.27	-	330.40	2352.65	349.71 (14.86)	328	91 (27.74)
2006-07	2463.00	-	-	-	-	-	-	-
Total	7495.28	3431.55	649.22	863.68	4944.45	1130.27 (22.86)	945	447 (47.30)

Secondary sources suggest that delays were usual in releasing funds from the State to the zilla parishads and then to each subsequent level. The timings of releasing the instalments are also not followed as per the guidelines; this has adversely affected the implementation of *Swajaldhara* in the State.

At the village level, people were not aware of the concept of 10 per cent capital contribution and they compared it with the supply driven schemes that were running parallel without any component of user charges. Hence, collection of the contribution from the villagers became a problem and it depended on the person or institute's ability to collect the amount. In many cases, the partial capital contribution was made by the contractor; this was in total violation of the whole concept of participatory approach. Inability to maintain the accounts was also an issue in many cases where the Village Water and Sanitation Committees (VWSCs) were lacking in capability and infrastructure. In programme guidelines, no distinction is made for tariff between house connection and community standpost and handpump. Hence, it was held that until the minimum (40 lpcd) coverage of water supply is achieved, house connection should not be encouraged. In most cases, the operation and maintenance (O&M) cost had not been estimated properly; many of the schemes failed due to poor O&M. Moreover, though there is near total dependency on groundwater resources for rural drinking water supply, no appropriate legislation has yet been formulated at the State level despite both the supply and demand driven approaches in place, treating sustainability of groundwater a critical concern.

Rural Sanitation

Madhya Pradesh continues to suffer from one of the poorest and disturbing records in rural sanitation. While the *Census of India 2001* pointed to a staggering 91 per cent of rural households not having access to *any* form of toilets, the proportion has only reduced to 87 per cent a decade later as noted in the *Census of India 2011*, clearly signalling a massive challenge facing the State as it has hardly made any efforts towards providing one of the

most basic amenities to its rural population. Moreover, the mere 13 per cent of households who have toilets, about 10 per cent have water closets whereas the rest have either pit or other type of toilets. Table 8 compiles district level figures on proportion of rural households having access to any form of toilets is revealing. Between the two *Censuses* of 2001 and 2011, more than 40 districts (of the total 50 districts) continue to have over 80 per cent of rural households without toilets. Even in 2011, there are as many as 21 districts where more than 90 per cent of rural households manage without access to any form of toilets; there is not a single district where the access is even 50 per cent. This is a sad commentary on the much-hailed success of the Total Sanitation Campaign (TSC) in the State. Moreover, the problem with such *Census* data is that, as observed by Khanna and Khanna (2005: 20), these neither indicate anything about the nature of *actual use* of the toilets nor the prevalence of biases based on region, caste and community.

As far as drainage is concerned, based on Das (2008:14), only 20 per cent of the rural households had wastewater outlets within the house and 90 per cent of them are connected through open drainage. Datia is the district where the highest proportion (50 per cent) of the households was connected to a drainage system. The coverage in other districts had been much less; in Jhabua district only 5 per cent of the households had some drainage facility. The PHED data also show that implementation of new schemes had been extremely poor and only a small fraction of total sanctioned schemes under the TSC had been constructed. It seems that though the funds are available, the skills needed for implementation are lacking.

Table 8 : Rural Households in Madhya Pradesh having No Toilets of any Type, by District, 2001 and 2011

Proportion	Districts (% of Rural Households Having No Toilets)	
	2001	2011
Above 90 %	Singrauli (97.9); Sidhi (97.3); Anooppur (96.2); Dindori (96.1); Shahdol (96.0); Rewa (95.7); Sheopur (95.1); Satna (95.1); Tikamgarh (95.0); Panna (94.5); Chhatarpur (94.2); Mandla (94.2); Damoh (94.0); Ashoknagar (93.8); Jhabua (93.6); Alirajpur (93.5); Barwani (93.4); Guna (93.4); Shivpuri (93.2); Katni (93.2); Morena (92.8); Sagar (92.6); Rajgarh (92.4); Balaghat (92.3); Umaria (91.8); Neemuch (91.6); Vidisha (91.5); Chhindwara (91.4); Seoni (91.2); Khargone (91.1); Shajapur (91.0); Ratlam (90.8); Mandsaur (90.5) Total: 33 districts	Singrauli (97.8); Dindori (96.3); Tikamgarh (96.1); Sidhi (95.9); Anooppur (95.6); Panna (95.0); Alirajpur (95.0); Chhatarpur (94.8); Shivpuri (94.4); Sheopur (94.2); Umaria (94.2); Jhabua (94.2); Damoh (94.1); Morena (93.3); Mandla (93.3); Ashoknagar (93.0); Guna (92.6); Shahdol (92.4); Rajgarh (92.2); Katni (91.4); Bhind (90.7) Total: 21 districts

(Contd.)

Table 8 : *(Contd.)*

Proportion	Districts (% of Rural Households Having No Toilets)	
	2001	2011
80%-90%	Khandwa (89.9); Betul (89.7); Bhind (89.5); Datia (89.5); Ujjain (89.1); Burhanpur (88.7); Dewas (87.4); Gwalior (86.9); Jabalpur (86.5); Dhar (86.4); Bhopal (85.1); Raisen (83.5); Sehore (83.4) Total: 13 districts	Barwani (89.7); Sagar (88.8); Datia (88.7); Vidisha (88.5); Balaghat (88.3); Chhindwara (87.7); Betul (87.1); Khargone (87.0); Neemuch (86.8); Mandsaur (86.7); Ratlam (86.6); Shajapur (86.6); Seoni (84.8); Gwalior (82.7); Khandwa (82.6); Rewa (82.2); Ujjain (82.1); Raisen (81.5); Burhanpur (81.5); Dhar (80.8) Total: 20 districts
50%-80%	Harda (79.9); Hoshangabad (79.6); Narsinghpur (78.4); Indore (74.9) *Total: 4 districts*	Bhopal (78.5); Sehore (78.3); Dewas (78.3); Satna (77.2); Jabalpur (73.2); Narsinghpur (72.5); Hoshangabad (66.2); Harda (61.7); Indore (58.5) *Total : 9 districts*
Less than 50%	–	–

Source : Final%20Data%20Sheet_mp.pdf (Accessed on June 1, 2012).

With this abysmal performance, any discussion on implementation of the TSC in the State amounts to mere redundancy. The most important reason for the failure of the TSC in Madhya Pradesh can be identified as the poor level of community awareness regarding sanitary and hygienic practices. It was surmised during the discussions with the PHED officials that the provision of the facilities *per se* had not helped much in the use and propagation of rural sanitation. Effective IEC remains an essential part of the TSC towards ensuring a change in knowledge, attitude and practice in the rural population. Unless people are aware and fully convinced about the drawbacks of open defecation, adopting modern toilets could be a daunting proposition.

Participation by the local community is also important while deciding upon the appropriate hardware technology for the toilets. The local context becomes important, especially, in areas with acute water shortage. Despite problems associated with managing Community Sanitation Committees, these may still be considered as alternatives to individual household latrines (IHHLs) in these difficult regions. Studies also suggest that a very low level of awareness prevails regarding solid and

liquid waste disposal in the villages and even TSC has not given due emphasis to the same. Construction of NADEP[7] pits and open drains has been taken up in some villages under TSC, but the efforts need to be scaled up.

Concluding Observations

The recognition of causes of the crisis in the drinking water sector leads one to think beyond the sub-sectoral constraints *per se* and to search for larger contexts within which the crisis subsists or grows. It is understood that the pristine source of water remains common for a variety of uses for domestic use, livelihood pursuits and also for the livestock. The problematic of *managing* water is *not*, in fact, as it is made out to be by a section of the concerned practitioners, donor agencies and scholars, a choice *between* the supply-led and demand-driven approaches, or, a foregone conclusion that the former has failed miserably and the latter is *intrinsically* efficient. Central to the issue of managing the resource there remains a clear distinction between water used for consumptive or domestic purposes and for productive purposes. If one classifies these two types of uses as basic and economic, respectively, then in an otherwise socio-economically skewed or fragmented society, the former entails *everyone* to have access to clean potable water as a right, to be ensured by the State. In that case, if a supply-led provisioning has been inadequate or irregular or biased (based on locality, caste or community) as much as a demand-driven strategy excludes a certain population on the criterion of affordability, both need correction.

Beyond the approaches to *provisioning*, arises a complex question regarding the right over the source, whether surface or groundwater. It is in here that much of local context and the macro legal or institutional framework become significant. In most part of the Indian rural society where the water economy, particularly, that for the groundwater, functions in a highly informal, unorganised and discrete manner, conditions essential for the organised water industry to work *efficiently* are difficult to implement. The informality refers to a range of issues including denial of access based on caste and class identity to over-exploitation of groundwater for solely private productive use.

In case of Madhya Pradesh, the aforesaid issues are observable in addition to the fact that State's efforts at enhancing the *supply* of water *per se* have been very limited. Even the absence of laws providing for curtailing excessive withdrawal of groundwater has acted against the interest of better and wider access of the resource. Further, lack of usable and reliable database on the coverage and related aspects has been a cause of concern. The scenario of rural sanitation in the State leaves much to be desired in terms of the massive intervention that is needed to raise the coverage from a deplorable about 13 per cent to achieving what may be termed a situation of open-defecation-free State.

Notes

1 Sourced at http://business.mapsofindia.com/india-state/madhya-pradesh-economy.html (Accessed June 12, 2012).

2 Following the Tendulkar estimates by the Planning Commission, this proportion was 53.6 per cent in 2004-05. Sourced at http://planningcommission.nic.in/news/press_pov1903.pdf (Accessed June 12, 2012).

3 A description of the criteria used to classify habitations as FC, PC and NC has been provided in Appendix 1.

4 There were only eight such districts, shown in italics, in Census of India 2001.

5 Sourced at http://cgwb.gov.in/gw_profiles/st_mp.html (Accessed on June 16, 2012).

6 Sourced at http://gis2.nic.in/cgwb/Gemsdata.aspx (Accessed on June 16, 2012)

7 This is a compost method developed by Naryan Devrao Pandri Pandey, hence, the acronym. A brick structure measuring 10'x6'x3' is prepared with holes in the side walls to ensure adequate supply of air during composting. The brick tank is filled with farm wastes, soil and cow dung and water is added to maintain moisture between 60-75% . A tank is filled with soil, 16-18qtls, farm wastes 14-16qtls, dung 1-1.2qtls. Water is added to moisture the material and upper layer is plastered with soil and dung mixture. After 75-90 days of composting, microbial culture of Azotobacter, Rhizobium and phosphate solubilising bacteria are added into the mixture. Compost becomes ready for use within 110-120 days. One tank provides about 2.5-2.7 t of compost sufficient for one hectare land. Another kind of NADEP, known as BHU-NADEP, does not require bricks in the construction of the tank, however, the method of filling is same as above. Sourced at http://www.mp.gov.in/biofarming/composting.htm (Accessed on June 20, 2012).

References

1. Agarwal. A., S. Narain and I. Khurana (eds.) (2001), Making Water Everybody's Business: Practice and Policy of Water Harvesting, Centre for Science and Environment, New Delhi.

2. Das, Keshab (2008), 'Drinking Water and Sanitation in Rural Madhya Pradesh: Recent Initiatives and Issues', Working Paper Series No. 183, Gujarat Institute of Development Research, Ahmedabad.

3. Das, Keshab (2001), 'Rural Drinking Water Supply in India: Issues and Strategies', in Sebastian Morris (ed.), India Infrastructure Report 2001: Issues in Regulation and Market Structure, 3iNetwork and Oxford University Press, New Delhi.

4. Das, Keshab and B.L. Kumar (1997), 'Sustainability of Drinking Water Supply in Rural Gujarat: Constraints and Prospects', in K. Pushpangadan (ed.), Proceedings: National Seminar on Rural Water Supply and Sanitation, Centre for Development Studies, Trivandrum.

5. Das, Keshab and B.L. Kumar (1996), 'Managing Drinking Water Supply in Rural Gujarat: Issues and Evidence', GIDR Working Paper No. 71, Ahmedabad.

6. Government of India, Census of India, Tables on Population, Office of the Registrar General of India, New Delhi, Various Years.

7. Government of India (2003), Census of India 2001, Tables on Houses, Household Amenities and Assets, Controller of Publications, New Delhi.

8. Government of India (1997), Census of India 1991, Availability of Infrastructure Facilities in Rural Areas of India: An Analysis of Village Directory Data, Office of the Registrar General of India, New Delhi

9. Government of Madhya Pradesh (2003), The Madhya Pradesh Human Development Report 2002: Using the Power of Democracy for Development, Bhopal.

10. Khanna, Amod and Chitra Khanna (2005), Water and Sanitation in Madhya Pradesh: A Profile of the State, Institutions and Policy Environment, WaterAid India, New Delhi.

11. Planning Commission (2011), Madhya Pradesh Development Report, Academic Foundation, New Delhi.

12. Scott, Wilson and IDC (2005), Rapid Assessment of Rural Water Supply and Sanitation Sector in Madhya Pradesh, A Consultancy Report Prepared for Madhya Pradesh PHED and UNICEF.

Appendix 1

The Rajiv Gandhi National Drinking Water Mission (RGNDWM) has fixed norms for providing potable drinking water to rural population, which are used to assess the number of rural habitations covered under water supply. These norms are applicable to the entire country, irrespective of the regional variations in the availability of water based on the climatic and geographical factors. Based on this, the State PHED conducts a survey of rural habitations every year, which partly reflects the impacts of government investments in this sector. Habitations are categorised under three main headings:

Fully Covered (FC): Habitations with a private or public drinking water source that is safe (i.e., without quality problems such as excess salinity, iron, fluoride, arsenic or other toxic elements or biological contamination), adequate (i.e., 40 litres per capita per day (lpcd) for 250 persons or less) and accessible to all, within 1.6 km of the habitation (or 100 meter elevation in hilly areas).

Partially Covered (PC): Habitations with a private or public drinking water source that is safe, accessible to all and within 1.6 km in plains (or 100 meter elevation in hilly areas) but with a capacity of less than 40 lpcd.

Not Covered (NC): A habitation with no private or public drinking water source that is safe, adequate, accessible to all, and within 1.6 km of the habitation (or 100 meter elevation in hilly areas).