



Water and Sanitation in Rural Areas of Madhya Pradesh

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Foreword

The Human Development Report, 1999 articulated the challenges of globalisation as ‘globalisation with *ethics* – less violation of human rights, not more; *equity* – less disparity within and between nations, not more; inclusion – less marginalisation of people and countries, not more; *human security* – less instability of societies and less vulnerability; of people, not more; *sustainability* – less environmental destruction, not more; and *development* – less poverty and deprivation, not more’. The policies and practices of governance when assessed within these parameters should be able to fulfill the standards laid down in the internationally accepted covenants of human rights. The present study explores the issue of water and sanitation in various dimensions and finds out that the current state of water and sanitation in Madhya Pradesh falls short on equity, inclusion, ensuring water security, sustainability of water sources and their long term impact on environment.

Consequently the study proposes to adopt the human rights framework to develop programmes and a rights based approach for designing interventions in the sector of water and sanitation. The study has come out strongly on the issues of social exclusion in any water supply project and the further marginalisation of the poor. It argues that a rights based perspective will enable institutions to focus on the needs of the poor, build their capacities to enable them to enlarge their choices and give them socio-political space to take charge of their lives and circumstances. The state of social and economic inequity prevailing in the rural areas are creating differentiations in access, availability and affordability of services related to water and sanitation and the delivery machinery does not seem to be equipped to handle these inequities. It also sends a warning signal on the deteriorating water

quality and its impact on health and well being of the community. Issues of governance need to be closely integrated in any water and sanitation programme approach with a sharper focus on entitlements and the quality and efficiency of delivery mechanism.

This study was done by WaterAid India to assess and understand the context of Rural Water and Sanitation programme in the state of Madhya Pradesh. This is a follow up of a desk review that was earlier done, that reflected the concerns and priorities of the service delivery system which was based on information gathered from the secondary sources. The present study assumes that each context presents its own array of related issues that have to be addressed through a matrix of programmes that strategise interventions in terms of geographical and thematic targeting to maximise impact on vulnerable groups. Therefore this study was undertaken to profile the State, Institutions and Policy Environment of Madhya Pradesh in 2005.

The issues identified by the study would seem relevant in the light of a rights based perspective and I hope that the study will allow the government agencies and civil society actors to sharpen their focus and evolve and develop strategies that are able to withstand the rigour of ensuring full enjoyment of human rights by all and accomplishment of Millennium Development Goals that have been accepted by the Government of India.

Mamita Bora Thakkar
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Abbreviations

CBOs	Community Based Organisations
DPAP	Drought Prone Area Programme
EGS	Employment Guarantee Scheme
IEC	Information Education and Communication
LPCD	Litres Per Capita Per Day
NGO	Non Governmental Organisation
O&M	Operation and Maintenance
OHT	Overhead Tank
PHED	Public Health Engineering Department
PRIs	Panchayati Raj Institutions
PTA	Parents Teachers Association
PWS	Piped Water Supply
SHGs	Self-Help Groups
TSC	Total Sanitation Campaign
WATSAN	Water and Sanitation

Executive Summary

1. Background

The WaterAid India (West), responsible for the states of Madhya Pradesh, Chhattisgarh and Uttar Pradesh, had commissioned a study to profile the State, Institutions and Policy Environment of Madhya Pradesh in 2005. The study outlined the state of water and sanitation in Madhya Pradesh and drew contours of issues that seemed relevant at the state level. The state level study is followed with a field study in selected areas to deepen the understanding of the issues identified and also to assess whether there are other issues that are not reflected in the data at the state level but are nevertheless critical at the community level. The present study is the follow up of the desk review and draws its methodology from the data presented in the earlier report.

2. Research Question

The study is focused on the main research question that has been stated as: What is the state and status of water and sanitation in the villages selected for the study?

The term water includes water required for domestic consumption; and sanitation refers to personal hygiene, disposal of human and animal excreta, liquid waste and household solid waste. The term state has been used to reflect the present levels of demand and supply of water and sanitation in the village/household and the term status is used to make an assessment of services in water and sanitation with respect to their adequacy and quality. The expression status has also been interpreted to take in to account trends related to levels of and services for demand and supply at the village level.

The main research question was further broken in to researchable issues that included: Demand for Water; Sources of Water; Accessibility of Water; Adequacy of Water Quality of Water; Sanitation and Institutional.

3. Methodology

The present research is a primary level study that has adopted the methodology of purposive sampling to initiate a detailed inquiry in to issues that have been identified during the desk review and also to address concerns of communities and individuals in water and sanitation at the village level. Six districts were selected as representative sample of the issues identified in the Desk study. Two Gram Panchayats were selected in each of the two blocks that were

identified in the sampled district. Thus the sample size of the study comprised of 50 villages in 12 blocks of 6 districts in the state. The districts covered include: Bhind, Shivpuri, Raisen, Shajapur, Chhindwara and Dindori.

The method of data collection included preparation of schedule of questions that were used as check list to collect information on Water (Resource and Use); Sanitation (Personal Hygiene, Cleanliness and Sanitation); and Institutional Roles. The information at the community level was collected from a wide array of stakeholders that included elected representatives of the Gram Panchayat, Government Officials at the village level, Office bearers of Community Based Organisations, Village Opinion Makers, Members belonging to different caste groups, Women, Senior citizens, Traders, shop owners and artisans.

The tools for data collection included Individual Interviews, Focus Group Discussion, Observation, Social Mapping, Time Line and Resource Mapping.

A team comprising of twelve persons as Research Associates were trained over a period of six days that included classroom and field practice sessions.

4. Main Findings

The main findings of the study are as follows:

Sources of Water

- The historical water sources used by the community that were perennial in nature have become seasonal at present due to over exploitation of water for livelihood purpose. The seasonality of these water sources has adversely affected the availability of water for domestic purposes for the households.
- The community fulfills its water requirements through a source-mix depending upon the seasonal availability of water in each of these sources. In most cases all such sources do not form part of the water sources developed by the formal system responsible for supplying water to the communities.
- With water shortage becoming a regular phenomenon, community and their sub-groups have not been able to develop effective coping strategies to deal with these shortages. Their choice is to go farther leading to loss of wages or to pay for water leading to higher cost for procuring water or to tap seasonal sources (jhiriya) that have variable consistency in terms of

potability. As a collective the communities have not been able to identify the core issues leading to water shortages nor their respective role in perpetuating these shortages.

- The formal system does not lay emphasis on recharging of water drawn from ground water sources as a result of which the numbers of such sources becoming dry are increasing. The Department's view is that it is impossible to recharge dry sources; hence they focus on identifying and accessing new sources of water. In most cases the current strategy of the department is to go deeper and tap more in to ground water sources.

Accessibility of Water

- The current policy for the implementation of interventions for provisioning of domestic water is habitation centric. It does not take in to account the social and economic dimension of such provisioning. The principles of ability to pay and payments as per usage have to be institutionalized to make the policies equitable and enable equity in accessing benefits by different economic groups in the village.

Piped Water Source

- Tube well is the main (albeit the only) source of water for Piped Water Schemes implies that sooner or later the source will go dry and will involve additional costs for deepening of the source or drilling of another tube well. These costs are not built in at the time of designing of the scheme.
- It seems that the department has not undertaken a proper assessment of its existing schemes nor does it have a vision or a strategy to upgrade the existing schemes that have a better option of ensuing water without raising expectations and cost of supply to the community.
- In all the villages the main complaint of the community was the irregular supply of electricity and its impact on regular and timely supply of water. The success of Piped Water Schemes depends entirely on availability and quality of electric supply.
- As a distribution system the way Piped Water Schemes has been designed and implemented it falls short on the principles of ensuring socio-economic equity for the poor and the socially marginalised sections of the population:
 - A comparison of the capacity of the overhead tank and the population covered implies that the Piped Water Schemes are unable to provide water as per entitlement defined in the policy.
 - Piped Water Supply (PWS) system is not supplied to all the households or the colonies. In all the 16 cases, the study found out that

the groups that are left out belong to the socially marginalised community- scheduled caste, scheduled tribe or the backward caste households/colony.

- PWS has had a positive impact on construction of private latrines in villages. The households that have a tap water connection within the house have gone in for construction of toilets within their premises. Since the private tap connections have been taken by the better off sections of the population the benefit of private latrines has also flowed to these groups in the village.
- Since the PWS rely heavily on ground water, any contamination of ground water will seriously impair the availability of water for a large number of households. Going deeper would imply tapping in to fossil water and going farther will entail additional costs. Secondly, the ground water provided through the PWS is raw un-treated water and it should be consumed within 36-48 hours after it has been drawn from the tube well or till will not be safe for drinking purposes.
- The chemical quality of water has an impact on the costs related to maintenance of the distribution system. For example, dissolved solids containing excessive sodium salts contributes to corrosiveness and pitting properties. Similarly the presence of iron above 1 mg per litre leads to deposition of iron sediments in the pipe line and encourages growth of micro organisms leading to complete blockage of pipe line within a short period. The rusty iron particles increase the turbidity of water. This issue has not been discussed either at the community or the department level and neither has it been built in to the design and budgeting of the PWS schemes.

Demand for Water

- The demand from the community's perspective is for households as a unit that comprise of demand of water for animal and occasional cleaning of the house/animal. The need is to bring the expectation (of the community) and delivery standards closer so as to make the approach driven by client expectations rather than on a theoretical understanding of the situation.
- The tendency to view drinking water needs of humans and animals differently does not work out in an economy where animals have a definite role to play. The discourse on safe drinking water for humans have to include and develop standards where the animals used for drought and dairying purposes, are included in the entitlements and rights issues. The dangers for not including the needs for animals have implications where the access of the poor and the marginalised for safe drinking water sources will be adversely affected at the cost of providing safe drinking water to animals.

- The consumption data reveals that people have developed their own mechanisms to change the location of water consumption depending on the availability of water in each water source. The policy needs to recognize this and set delivery standards that state that the entitled quantity and quality of water for domestic purpose will be made available at the house or at the water source(s).

Quality of Water

- Testing for water quality is solely dependent on the Public Health Engineering Department (PHED). The community or any of the institutions of local self governance are not involved in the testing of water or as consumers of the test reports. This creates pressures of numbers and coverage for testing on the department, and it does not provide community with information that has direct implications for their health and well being.
- The processes and procedures for water testing are based on random sampling methods and on expressed complaints.
- As such there is no regular monitoring system for testing quality of water. As a result not all water sources are tested at regular intervals and neither a profile of water quality developed for the villages/Panchayats.
- The PHE department was not willing to share the test reports. At best the team was asked to copy the test results from the registers kept in the lab.
- In their current form the reports are not comprehensible to an average reader as they do not specify the acceptable limits for each parameter.
- The department is expected to mark the water sources with symbols that are supposed to warn the consumers about the state of water quality of the source. The department on their part has not made these symbols popular and the community has not heard nor is aware about the meaning of these symbols.
- The use of water sources have the factor of seasonality attached to them. Some of these sources fall within the private domain. The need is to map all the functional water sources (actually used) in the village and a water quality monitoring cum surveillance system set up for each of them.
- The current practice of immediately closing the water source before creating a viable alternative for the community is a potential area of conflict. It also creates an impression that the community is resisting closure. The fact is that the community is equally concerned about the quality for water and is willing to shift provided an alternative is created.
- The issue of water quality should be addressed on all parameters- chemical, bacterial and physical. This can form an important component of the

Information, Education and Communication (IEC) messages and can be contextualised within the quality problem of each village.

- The health implications of consumption of contaminated water have serious economic consequences for the poor. Apart from the loss of wages on account of diseases that have a higher strike rate amongst the poor, there are additional expenditures on fuel (as the food takes longer to cook) and on soap/cleaning agent (as more is required for cleaning of clothes and bathing).

Sanitation

- The level of awareness on issues related to hygiene and sanitation in the community is not the inhibiting factor to institutionalize better practices amongst them. The critical factor is the behavioural aspect of better hygiene and sanitation practices. The community has come to accept and learned to live in conditions that fall short on standards of healthy environment.
- There is a critical link between availability of water and better sanitation practices. This is observed in case of use of toilets and in carrying out activities related to personal hygiene. Thus issues of sanitation should be linked to and addressed along with planning for water.
- The approach to sanitation at the village level has been activity focused. That is, the sub-components of sanitation have been sought to be addressed in isolation- toilet construction, personal hygiene, solid waste disposal and liquid waste disposal. Addressing any one of them does not effectively address the issue of sanitation. Implementing one of the components- over emphasis on toilets under Total Sanitation Campaign (TSC)- is not likely to make difference in people's life unless other issues are also addressed.
- Schools have been identified as a major source of information related to matters of personal hygiene. This factor should be accounted for the development of overall strategy for IEC and efforts at community mobilization. It also implies that the role of other service delivery mechanism especially Anganwadi and Health should also be reassessed to ascertain how they can also impact the awareness and behavioural levels of the community.
- In discussions with children, parents and teachers there did not emerge a demand for provisioning of toilet facilities either in schools or Anganwadi centres. Neither was it reported that the children (including girls) are shying away from school because toilet facilities have not been provided in the building.
- The case of PHE offices in the district deserves to be mentioned as it is this department that is responsible to carry out IEC activities in the district and has a large number of visitors from

the village. The PHE office should locate different models of toilets within its premises and maintain a high standard of cleanliness so that rural visitors carry the message with them and strengthen the IEC messages.

- The general quality of building of the institution is important before undertaking construction of facilities for toilets and urinals. Since the two constructions fall in to separate administrative domains- Directorate of Public Instructions (school building) and PHE Department (toilets) it is seldom that the two departments converge and identify buildings of reasonable quality that should go in for construction of toilets.
- There is high level of awareness in the children regarding hand washing practices, dental hygiene, bathing, personal hygiene, water handling practice and community sanitation. They can even recall the benefits of toilet in houses and institutions. Yet the actual behavioural practice of children is in stark contrast to their level of awareness.
- The general availability of water in the village defines the content of what the teachers in school teach and monitor regarding hygiene and cleanliness among children. In villages where there is water shortages the teachers reported that they find it irrelevant to discuss about bathing daily and maintaining high standards of cleanliness when they are aware that there is general water shortage in the village. Similarly in villages that are affected by water quality the teachers were concerned as to how much should they emphasize on cleanliness when they are aware of the poor quality of water that is available to the community.

5. Recommendations

The main recommendations of the study are as follows:

(a) Approach to Programming

The study proposes a Human Rights Development perspective as an approach to programme development. The Rights perspective focuses on the entitlements defined in the state policies and designs interventions that enable the state to fulfill its commitments. At another level the perspective also identifies gaps in the present policy and dialogues with the state in fulfilling these policy gaps.

In addition to the fact that the rights based approach focuses entirely on the issue of good governance, in the present context it will also highlight the state of social and economic inequity prevailing in the rural areas that are creating differentiations in access, availability and affordability of services related to water and sanitation. The other issues of deteriorating water quality; and the degree

and nature of participation of the poor and the marginalised too will come at the centre stage of interventions. An important area that should, and is likely to emerge, within the rights based framework is the missing discourse on entitlements related to sanitation.

(b) Programming Interventions

Development of Demonstrative Models: Developing demonstrative models based on the principles of integrated and holistic planning has repeatedly emerged in the discussion of the data collected from the villages. The term integration refers to sub-sectoral integration (water and sanitation) and the term holistic refers to planning in entirety (planning for water source, water use, supply mechanism etc given the competitiveness between alternative uses of water).

The community hitherto had been accustomed to resource availability is now faced with a situation of shortage of resources. Its use patterns and its culture of resources sharing are coming under stress leading to potential areas of socio-political conflicts. Symptomatic treatment of the problem by exploiting-more-to-satisfy-more is not sustainable and cannot last beyond the short-term. The need for preparation of negotiated plans between competitive uses of water would be able to effectively address the core issue of making water sources sustainable (perennial) and water use pattern.

The demonstrated plans should address the issues related water stress, water security, water quality, water distribution, water and sanitation and environmental sanitation practices. The Programme for demonstrative model should not only restrict itself to the preparation of the plan but also implement the plan as well. Such demonstrations will serve as the learning hub on issues related to water and sanitation in the state for the government as well as the civil society actors

Programming for IEC: IEC components are either not given enough emphasis by the government or they tend to have messages that are generic in nature expected to fit all situations and context. The current study has repeatedly pointed out that it is not the level of awareness that is the inhibiting factor but the behavioural aspect that need to be addressed. This would require preparation of context and situation specific IEC campaigns and modules that work as functional models that can be used by field functionaries. Such an IEC programme should also focus to develop institutions that are 'nearer' to the community or its groups like schools, Anganwadi centres, Health workers etc. That is an IEC Programming could be taken up that develops mechanisms and processes to make the IEC relevant and effective.

Advocacy: The advocacy framework for water and sanitation should be primarily focused on the issue of good governance. That is, policy statements related to water entitlements need to be reinterpreted and refocused based on the perspective and needs of the community and its sub-groups - the poor, the socially and economically marginalised.

The advocacy effort should make the political representatives equally responsible and accountable for the state and situation of water and sanitation as it would hold the delivery mechanism of government department responsible for the efficiency and effectiveness in implementation.

Introduction

1.1 WaterAid India

WaterAid is an international Non governmental organisation (NGO) focussed exclusively on ensuring the provision of safe domestic water, sanitation and hygiene education to the world's poorest people. With its headquarters in the United Kingdom, WaterAid works in 15 countries, mostly in Asia and Africa.

WaterAid's India programme started in 1986 with a dominant presence in the southern states of the country. With the Country Programme Office at Tiruchirapalli, WaterAid has been working with more than 70 partner organisations in Tamil Nadu, Andhra Pradesh, Maharashtra, Orissa and Karnataka.

A review of the India programme in 2002 underlined the commitment of WaterAid in developing methodologies that set standards of good practice for water, sanitation and hygiene projects in these states. The demonstrated impacts in the southern states gave confidence to WaterAid to focus on the poorer states in the northern part of the country. As a strategic move the headquarters of the country programme was shifted to New Delhi to work closer with policy makers. Regional offices were opened in Bhopal and Bhubaneswar in 2002 to work closely with most vulnerable communities in Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Orissa, Bihar and Jharkhand.

1.2 WaterAid India (West)

The WaterAid India (West) office is located at Bhopal and works in Madhya Pradesh, Chhattisgarh and Uttar Pradesh. The regional office is expected to work within the strategic framework of the country programme of intervening through integrated projects that combine water, sanitation and hygiene promotion to maximise benefits to poor communities.

WaterAid recognises that each context presents its own array of related issues that have to be addressed through a matrix of programmes that strategise interventions in terms of geographical and thematic targeting to maximise impact on vulnerable groups. Consequently, each regional office is expected to identify and develop its operational strategy for the states it is intervening in. The WaterAid India (West) office commissioned a study to profile the state, institutions and policy environment of Madhya Pradesh in 2005 in pursuance of this requirement. The study outlined the state of water and sanitation in Madhya Pradesh and drew contours of issues that seemed

relevant at the state level. The state level study has been followed with a field study in selected areas to understand issues better and to assess whether there are other issues that are not reflected in the data at the state level but are nevertheless critical at the community level. The present study is the follow-up of the desk review and draws its methodology from the data presented in the earlier report.

1.3 Summary of Desk Review

Madhya Pradesh with a population of 6.03 crores has a higher growth rate than the national average and is characterised by low density that is reflective of the spread and sparse nature of its 1,26,310 habitations. The 35 per cent of the population belongs to Scheduled Caste and Tribe that are concentrated in 19 and 13 districts of the state respectively.

Agriculture is the main source of occupation (71 per cent of the work force) but suffers from low productivity. This is reflected in the fact that 37.43 per cent of the state's population is below the poverty line.

Institutionally, decentralised governance in the state has endowed Gram Sabhas with substantial powers to set in motion a system of participative democracy. The three-tier system of Panchayat Raj institutions is in place to support and coordinate the activities of the Gram Sabha.

The rainfall in the state has a high degree of temporal and spatial variability. The state is richly endowed with surface water and encompasses five major river basins within its political boundary. However, 99 per cent of the drinking water needs are being fulfilled with ground water and 90 per cent of the ground water is being used for irrigation purposes, signifying too much reliance on groundwater utilisation. There is no notable evidence of conjunctive exploitation of ground and surface water and the groundwater has been found to be affected with fluoride, salinity and iron.

The current strategy of the government does not seem to address the issue of water quality in its holistic perspective. The main approach for provisioning of drinking water is habitation-centric, which does not give importance to issues related to source sustainability, or achieving an optimal mix of surface and groundwater. The community on the other hand is predominantly dependent on sub-surface water (dug wells) for fulfilling its drinking water needs. There are indications at the state level that the piped/spot

water schemes are faced with problems in sustaining community participation.

There is lack of critical data at the state level for both demand and supply of water. The data on different sources of demand and their seasonality, how they are currently being met or the cost of procuring water are not available. Similarly, on the supply side, the data on slippage of habitation are not available.

In sanitation, only nine per cent and 19 per cent of the households in rural areas in the state have private latrines and are connected with wastewater drainage respectively. The low coverage spreads across all regions and districts. Guided by the policy of Total Sanitation Campaign (TSC), the main assumption of governmental intervention is that if the facility is provided it will lead to behavioural change within the community. Information Education and Communication (IEC) interventions that aim towards behavioural change to generate demand for better sanitary and hygiene practices have not been given due importance in the implementation of the Campaign.

At the institutional level, the main responsibility of providing water in rural areas is that of the Public Health & Engineering Department (PHED). The Department is however ill-equipped to set in motion processes related to community participation as it does not have a cadre of extension workers. There is no systemic evidence of convergence between the PHE department and other related departments notably Health, Rural Development and Agriculture. In terms of decentralisation to Panchayat Institutions there has been transfer of power without consequent transfer of funds and functionaries which has rendered decentralisation ineffective.

The rural Water and Sanitation (WATSAN) in the state is financed from centrally sponsored schemes. The scope for community contribution is only in case of interventions related to sanitation only. The budget for water and sanitation is Rs 178 crores for 2004-05. Of this 77 per cent is for water, 18 per cent for sanitation and 5 per cent for, administration cost. The low level of priority to sanitation is thus reflected in the budgetary provisions of the PHE Department.

The state government has a draft Water Policy and Health Policy. The former does recognise the

importance of drinking water, but falls short of addressing the concerns of the poor, women and the issues related to sustainability. Within the health policy, there is no mention of water and sanitation as the key determinants of health. This is an important omission, as the policy downplays the ability of the communities to address the determinants and control their lives better.

1.4 Field Study

The findings of the desk review identified issues at three levels.

1. Sub-regional issues that are specific to selected areas in the state based on indicator selected for review. For example, the issues of resource endowment, quality of resource, resource utilisation patterns, and coverage reveal a regional variation and form clusters within the state. This implies a differential programming intervention that is sub-regional in character based on the choice of indicator.
2. Systemic issues which are generic and global in nature. For example, choice of technology, institutional mechanisms, role of Panchayat institutions etc. These are issues that would prevail in any given district of the state and will therefore form the common base for programmatic intervention for the state.
3. The issues identified and articulated in the desk review were based on secondary literature which primarily reflected the needs and concerns of the delivery system. People's issues appear as a data gap in the study. For example, the mix of formal and non-formal sources of water, issues in hygiene and sanitation perceived by the community, notions of water quality, coping strategies of communities during periods of water stress etc.

The field research was thus conceived of as a primary level study with a purposive sampling bias to initiate a detailed inquiry into issues that were identified during the desk review and also to address concerns of communities and individuals in water and sanitation at the village level. WaterAid India (West), the primary user of the research, will use it to develop programme interventions in Madhya Pradesh.

Methodology

2.1 Objectives of the Study

The aims of the study were with WaterAid India regional office. The field study was carried out to

1. assess the demand for and supply of water in communities and strategies adopted by them, including water markets, in fulfilling their demand for water;
2. identify the role of women and children in accessing water for the households and the perception of the community towards them;
3. assess the social dimension of WATSAN delivery (disabled, untouchables, dalits etc) and the impact on these groups because of lack of delivery system;
4. identify the community's perception related to hygiene and sanitation and assess how much of their requirement is being fulfilled by the current governmental/non governmental interventions;
5. assess the measures undertaken by the community/government for ensuring source sustainability for drinking water;
6. assess the role and capacities of the institutions of local governance in providing water and sanitation services including operations and maintenance (O&M), to the community and the households;
7. assess the role and capacities of the government department in providing water and sanitation services including O&M to the community and the households;
8. identify the issues related to implementation level of government programmes including role and kind of information, education and communication (IEC), who is involved and in what;
9. identify specific cases to establish linkages between poor WATSAN delivery and poor health in the community; and
10. analyse the findings in the light of current policies and programmes of the governments and non governmental agencies.

The study thus sketches a wide canvas wherein it treats water as a resource and a public good subject to private demand for domestic consumption. The focus of inquiry is on the nature and quantum of demand for water, the various mechanisms adopted to fulfill these demands and whether these systems operate differently for marginalised sections. In the case of sanitation, the study is client-centric and seeks to assess their perception related to hygiene and sanitation and the adaptability of the delivery system to address their requirement.

2.2 Research Question

The main research question for the study is articulated as follows:

What is the state and status of water and sanitation in the villages selected for the study?

The term 'water' includes water required for domestic consumption the term 'sanitation' refers to personal hygiene, disposal of human and animal excreta, liquid waste and household solid waste. The term 'state' has been used to reflect the present levels of demand and supply of water and sanitation in the village/household. The term 'status' is used to assess the adequacy and quality of water and sanitation services. It also accounts for trends related to levels of and services for demand and supply at the village level.

The researchable issues that follow from the main research question are

1. *demand for water* (purpose, seasonal variations and notions of quality associated with the purpose for which water is required);
2. *sources of water* (different water sources, trends in water availability, relationship between sources and purpose for which water is required);
3. *accessibility of water* (social and economic accessibility to water, governmental and non governmental interventions that increase/decrease accessibility to water);
4. *adequacy of water* (extent of demand-supply gap and of its seasonal variations);
5. *quality of water* (notions of quality, levels of awareness on quality of water, governmental and non governmental interventions to improve quality of water);
6. *sanitation* (sanitary practices of the community, perception on hygiene and sanitation); and
7. *institutional* (type and quality of governmental and non governmental intervention on water and sanitation, role of panchayati raj institutions (PRIs) and community-based organisations (CBOs) in ensuring services, interventions related to awareness and behavioural change).

2.3 Scope of Study

The present field study is limited in that it focusses on

1. water for domestic consumption and sanitation related to personal hygiene, solid and liquid waste generated by households;

- inquiry will be in selected villages based on the sampling plan of the study;
- the findings and conclusions of the study will be based on the primary information generated during the course of inquiry with the community; and
- the analysis of the information will be guided by the needs of the primary audience of the study, WaterAid India.

2.4 Sampling Plan

The design of the present study is directed to institute inquiry into specific issues as highlighted by the desk review of water and sanitation in Madhya Pradesh. Consequently, the sampling plan for the selection of study area is purposive and biased in favour of study problem areas only.

2.4.1 Selection of Districts

The data generated by the desk review was used to develop the sampling plan for the district.

Step 1: List of districts that fall within the low rainfall region and the districts that are categorised as Drought Prone Area Programme (DPAP) were selected. This led to selection of 21 districts.

Step 2: Districts selected in Step 1 were further grouped as districts that have low rainfall and are also DPAP and districts that are only DPAP. The regrouping of districts in this fashion led to the following matrix:

Districts with Low Rainfall and also DPAP	Districts that are only DPAP
Bhind Shivpuri Jhabua Khargone Barwani Khandwa Ratlam Shajapur Dhar	Raisen Rajgarh Betul Seoni Shahdol Jabalpur Rewa Chhindwara Sidhi Damoh Panna

Step 3: The two categories of district were grouped into 2x2 matrixes where the issues of water quality and of level of groundwater exploitation were marked on the vertical and horizontal axis respectively.

Step 4: There were thus 15 districts with problem of water quality of which four had problems of both water quality and over exploitation of ground water. It was decided to select

		Low Rainfall & DPAP Districts		DPAP Districts	
Water Quality	Problem	Bhind Shivpuri Jhabua	Ratlam Shajapur Dhar	Raisen Rajgarh Betul Seoni Shahdol Jabalpur Rewa Dewas	Chhindwara
	No Problem	Khargone Barwani Khandwa		Sidhi Damoh Panna	
		Not Over Exploited	Over Exploited	Not Over Exploited	Over Exploited
Ground Water Exploitation					

one district from each of these boxes as the representative district of the particular issue.

Step 5: To narrow the selection of the district, the additional *criteria* was

- Comparison of Poverty Ratios to select district with the higher ratio;
- Proportion of SC and ST to select district with higher percentages; and
- Preference for sector reform district.

The application of these criteria led to the selection of the following districts

- Bhind
- Shajapur
- Raisen
- Chhindwara

Step 6: The coverage data of the districts revealed very low sanitation coverage for Dindori. Thus as a special case, Dindori was selected as the fifth district.

Step 7: The regional office of WaterAid has started its interventions in Madhya Pradesh. At the time of the study, it was intervening in the districts of Bind, Morena, Datia, Shivpuri, Gwalior and Bhopal. The regional office was interested that the field study should take an additional district where WaterAid is currently intervening that will enable an reassessment of its current interventions. This led to the selection of Shivpuri as the sixth district for the study.

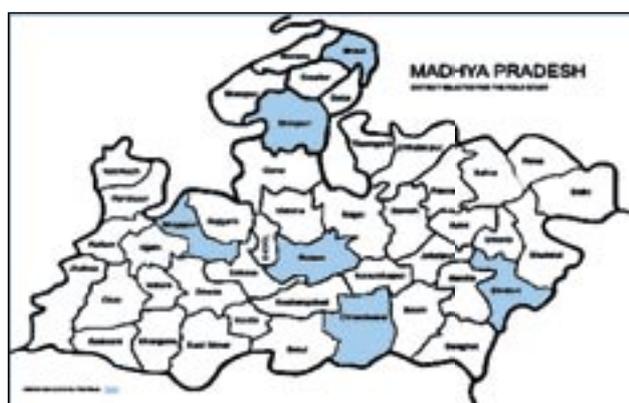
The districts that were finally selected for the study and their representative characteristics are as follows:

Table 2.1 District Selected for the Study and their Representative Characteristics

District	Rainfall	DPAP	Quality	Groundwater*	Poverty Ratio#	SC/ST	Sector Reform	WAI District
Bhind	< 100 cms	✓	Salinity	Safe	51.5%	21% SC	-	✓
Shivpuri	< 100 cms	✓	Fluoride	SC-3 blocks	46.9%	19% SC	-	✓
Raisen	> 100 cms	✓	Fluoride Salinity Iron	SC-3 blocks	59.1%	16% SC	✓	-
Shajapur	< 100 cms	✓	Fluoride Salinity Iron	OE-1 block C-1 block SC-4 blocks	52%	22% SC	-	-
Chhindwara	> 100 cms	✓	Fluoride	OE-1 block	56.9%	34% ST	✓	-
Dindori	> 100 cms		Fluoride Salinity Iron	Safe	NA	60% ST	-	-

* SC : Semi-Critical; C : Critical; OE : Over Exploited; # Figures from Human Development Report, Madhya Pradesh, 2002

Map 1 Districts Selected for the Study



2.4.2 Selection of Blocks

Two blocks in each district were selected. The criteria for the selection of the block were to be the same as the criteria for selection of the district. For example, if Chhindwara district was selected because it has problems of water quality and excessive ground water exploitation, then the selection of block within the district was undertaken by applying the same criterion. The selection of blocks was done in consultation with PHE Department at the district level. Blocks selected in each district are given in table 2.2.

2.4.3 Selection of Gram Panchayat

Two Gram Panchayats in each of the selected blocks were selected for the study. The criterion for the

Table 2.2 Blocks Selected for the Study and their Selection Criteria

District	Block	Quality	Ground water	SC/ST	Other Reasons
Bhind	Bhind	-	Safe	20% SC	WAI block
	Mehgaon	Salinity	Safe	20% SC	-
Shivpuri	Shivpuri	Fluoride	Safe	19% SC	WAI block
	Pohari	-	Safe	20% SC	-
Raisen	Sanchi	-	Semi-critical	19% SC	Sector Reform
	Gairatganj	Fluoride Salinity	Semi-critical	21% SC	Sector Reform
Shajapur	Susner	Fluoride	Critical	24% SC	-
	Nalkheda	Salinity	Semi-critical	24% SC	-
Chhindwara	Amarwada	Fluoride	Semi-critical	39% ST	Sector reform
	Pandurna	-	Semi-critical	40% ST	Sector reform
Dindori	Amarpur	-	Safe	65% ST	Innovation by PHE
	Mehadwani	-	Safe	77% ST	High NC habitations
	Samnapur	Fluoride Iron	Safe	64% ST	-

selection of the Gram Panchayat was the same as the criterion for the selection of the block so that representative character of the block is maintained at the primary level also. The selection of Gram Panchayat was done in consultation with the PHE Department at the district and sub-divisional/block level. The Gram Panchayats selected in each of the blocks were as follows:

Table 2.3 **Gram Panchayats Selected for the Study and their Selection Criteria**

Block	Gram Panchayat	Reason for Selection	Number of Villages
Bhind	Didi	WAI Village	2
	Sarsai	Depleting Water Table	2
Mehgaon	Gata	Quality, Depleting Water Table	2
	Gaheli	Quality, Depleting Water Table	3
Shivpuri	Dhaulagarh	Piped Water Scheme, Depleting Water Table	1
	Sakalpur	Depleting Water Table, Quality	2
Pohari	Bhainsrawan	Depleting Water Table	3
	Agarra	Watershed works	3
Sanchi	Narwar	Sector reform	1
	Kharbai	Sector reform Quality	2
Gairatganj	Pati	Sector reform Quality	4
	Bhanpurganj	Quality	4
Susner	Barai	Depleting Water Table, Quality	1
	Naharkheda	Depleting Water Table, Quality	2
Nalkheda	Gudrawan	Depleting Water Table, Good sanitation	2
	Berchakhedi	Depleting Water Table, Quality	2
Amarwada	Singori	Depleting Water Table, Quality Sector Reform	1
	Babai	Sector Reform	2
Pandurna	Umri Kalan	Depleting Water Table, Quality	2
	Sirata	Depleting Water Table, Quality	1
Amarpur	Khajrimal	Traditional system	3
	Balpur	Not covered villages	4
Samnapur	Bargaon	Quality	2
	Kiwad	Depleting Water Table, Quality	2

Thus the sample size of the study comprised 50 villages in 12 blocks of six districts in the state. It needs to be reiterated that the selected villages are biased in that they are representative of specific problems related to water and sanitation.

2.5 Method of Data Collection

2.5.1 Schedule of Questions

A checklist of questions and issues was prepared for four different aspects to collate the information collected from the villages. These checklists were related to information about the village, water as the resource and its usage, practices related to sanitation and roles and responsibilities of institutions.

Village Schedule

The schedule was designed to collect information on

1. population including number of children, castes in the village; groups belonging to the rich, the middle class and the poor in the village, and persons with disabilities;
2. information related to members of Gram Panchayat;
3. information related to social and civic structures and services in the villages including the names of persons appointed to deliver these services;
4. connectivity of the village;
5. major occupations pursued by people in the village and people belonging to these occupational categories; and
6. CBOs, SHGs in the village and names of their office bearers.

Water Resource and Use

1. listing of all water sources in the village;
2. seasonal availability of water in the sources;
3. identity of persons/groups that use water from each source;
4. responsibility for maintenance of water sources;
5. information about sources that have dried up;
6. water requirement for personal hygiene, domestic purpose, occupation and livestock;
7. specific problems about water; and
8. notions about water and its quality.

Sanitation–Personal Hygiene, Cleanliness and Sanitation

1. practices related to bathing, hand washing, cutting of nails, place for defecation, water handling and dental hygiene;
2. practices related to liquid and solid waste disposal;
3. practices related to safe handling of vegetables;
4. practices related to cleanliness of livestock and their shelter;
5. practices related to cleanliness of water sources;
6. perception related to need for private latrines;

7. practices related to cleanliness of drains and village streets;
8. relationship between Gobar Gas and cleanliness of the house;
9. occupations in the village that generate unsanitary waste, and mechanisms for disposal of such waste; and
10. perception on relation between sanitation and diseases.

Institutional Roles

1. responsibility for maintenance of handpumps;
2. responsibility for maintenance of cleanliness in the village;
3. role of Non governmental organisations (NGOs);
4. role of Community-based organisations (CBOs), Self-help groups (SHGs), Village Committees in water and sanitation;
5. role of Panchayat in water and sanitation;
6. role of government in water and sanitation; and
7. perception of the messages related to hygiene, cleanliness and sanitation.

2.5.2 Sources of Information

At the community level two sources of information have been identified:

Individuals with Specific Characteristics

- Elected representatives of Gram Panchayat (Sarpanch and Panch)
- Government officials at the village level (teachers, Anganwadi workers, Auxillary nurse midwives (ANMs), Veterinary assistants, Panchayat Secretary etc.)
- Opinion-makers of the village (big landlords, Patels, priests, traditional leaders etc)
- Office bearers of CBOs, SHGs and other informal groups in the community

Groups with Specific Characteristics

- Caste groups
- Women's groups
- Senior citizens
- Children
- Artisans and people engaged in handicrafts
- Traders, shop owners, hoteliers etc.

2.5.3 Tools for Data Collection

The tools for data collection included:

- (a) **Individual Interviews** with persons identified with specific characteristics. The interview was conducted through a semi-structured format that served as a checklist.
- (b) **Focus Group Discussions** with identified groups in the village to converse and discuss issues based on a checklist prepared for the purpose.
- (c) **Observation** by the research team through a semi-structured format.

- (d) **Social Mapping** was conducted to map the habitation and settlement pattern of the village and also to identify social and economic groups in the village.
- (e) **Time Line** of the village to capture the history of the village in general and history of water more specifically.
- (f) **Resource Mapping** to locate water sources and social and civic services in the village.

2.6 Training Research Associates

A team of 12 Research Associates was trained over a period of six days:

Days One and Two

These were classroom sessions that discussed issues in water and sanitation, research processes and methodologies, practices on mapping techniques and understanding the checklist of questions.

Data Collection Process in Kharbai Village (Sanchi Block of Raisen District)

Three days were spent in Kharbai village to complete the data collection process. The process involved the use of following tools:

Tool Used	Where it was Done	With Whom
Time Line, Social and Resource Mapping	Darohi colony Pandit colony Pal colony Muslim colony	Women's Group Men's Group Men's Group Mixed group
Focused Group Discussions	Pandit colony Muslim colony Daarohi colony Pal colony School colony	Men and Women Men and Women Men and Women Men and Women Children
Individual Interviews	PRI Representatives	Sarpanch Ex-Sarpanch
	Government personnel	Teacher ANM Assistant Veterinary Clinic Anganwadi Worker
	Others	Shops Owners Dhaba Owners Teacher of Private School Persons with Disability
Village Transect	All sources of water Site of Brick Kiln Sanitation & SWD disposal	Along with persons from the village

Days Three and Four

Two teams were formed that visited two Gram Panchayats in Raisen that had been selected for the study. The tools of data collection and the list of questions were used and field-tested.

Days Five and Six

They comprised sharing of experience and fine-tuning the checklist and the tools to be used at the village level. The framework for data compilation and analysis was developed during these discussions.

Day six involved completing the field work in the selected Panchayats and compiling the data of the villages.

2.7 Limitations of the Study

The study in its current form has the following limitations.

1. The study has not collected data on the geo-hydrology of the study area. As a result the appropriateness on the choice of technology for

providing water is not based on any assessment of the technical details of the geo-hydrology. The appropriateness of technology is commented upon more in terms of its ability to provide water to the communities and its various socio-economic groups.

2. The data on quality of water that has been used in the analysis is based on the data provided by the PHE Department or by the community. The study did not undertake a quality testing of water of the villages studied. The analysis is based on the information provided by the community and on their notions of quality.
3. In the absence of historical data on diseases in the village the study was not able to establish the relationship between water and disease pattern in the village. The cases identified were anecdotal and hence the analysis and the conclusion are impressionistic in nature.

Water

3.1 Sources, Availability and Accessibility

3.1.1 Sources of Water

Traditional Sources of Water

Historically, human settlements have had the tendency to gravitate towards areas that had a perennial supply of water. The study inquired into the history of water sources that were used for domestic purpose¹ in each village. The data provided by the community is presented in Table 3.1.

The table highlights the fact that the early settlers' ability to convert natural endowments into resources depended largely on the contextual factors of the region that included the topography, the geo-hydrology and the vegetative pattern of the area. For example, Dindori is located in Maikal ranges and forms part of Narmada basin. The area is thickly forested and due to the presence of basalt, the geo-hydrology allows availability of sub-surface water at shallow depths. The Baigas, the inhabitants of the district, were nomadic and have been practising settled agriculture since the past hundred years only. The early settlers amongst this community found it convenient to dig shallow wells (*jhiri*) that are 9-10 feet deep (6-7 *haath*). As a result, the traditional sources of

water for most villages in the hills and forests are shallow wells.

The water sources in Chhindwara and Raisen present similarities. Both the districts form the water divide area: Narmada and Wainganga river basins in case of Chhindwara; and Narmada and Betwa river basins in case of Raisen. Both the districts has dense forests and parts of the districts comprise Satpura Mountain range that tapers off towards the plains of central Madhya Pradesh and plains of Nagpur sub-region, respectively. The area thus has an abundance of perennial rivulets and attracted a number of early settlers.

Bhind lies in the Chambal valley. The hills are few, small and isolated. The topography of the area is predominantly that of valley plains. The division in topography is offered by rivers that criss-cross the district. Chambal and Sind are the main rivers of the district forming part of the Ganga drainage system. These two rivers are joined by Kunwari, Pahuj, Asan and Vaisali at different points in the district. In such a topography, it is but natural that the early settlers chose to locate their settlement near a river that is part of the drainage network system of the district. The discussions on the history of settlements with the community revealed that these rivers were perennial (*barah masi*).

Table 3.1 Traditional Sources of Water in Villages Selected for the Study

	Bhind	Shivpuri	Shajapur	Raisen	Chhindwara	Dindori
No of Villages	10	9	7	11	6	7
Surface Water						
River	7	-	5	6	6	5
Rivulet	-	2	5	2	2	-
Stored Surface Water						
Ponds & lakes	-	4	-	2	-	-
Sub Surface Water						
Wells	7	6	4	6	-	7
Bawadis	-	-	6	-	-	-
Jhiriya	-	4	-	5	2	7
Ground Water						
Handpump	-	-	-	-	-	-
Tubewell	-	-	-	-	-	-

¹ Domestic Water includes water required for drinking, personal hygiene, washing clothes and utensils, cooking and water required for livestock.

The Shajapur district has deep black and shallow black brown and alluvial soils of the northern region. The district comprises of the Agar plateau; forested upland; Kali Sindh basin and Shajapur upland. The hill tracts comprise a chain of hills rising in the middle of the district and play a major part in determining the drainage of the district. Being an upland area with characteristics of Malwa plateau it gives rise to a number of seasonal streams that dissect the hills forming draining patterns that feed into and maintain the perennial flow of Choti Kali Sindh, Lakhundar, Ahu, Namwaj and Parbati rivers. The settlers in the district were careful not to locate themselves too close to the rivers as the water levels would rise during and immediately after monsoon. This necessitated that they also adopt the technology of *bawadis* to support the availability of water during dry summer months.

Shivpuri district comprises three geological regions of Bundelkhand trap, the Deccan trap and the Upper Vindhya. This has resulted in a topography that is a mixture of uplands with shallow valley, undulating plains and flat-topped ranges. The district falls in the water divide area of the basins of Chambal, Betwa and Ken rivers. The district is served by four perennial rivers – the Parbati, Betwa, Sindh and Kuno. But, due to its topographical characteristics, most of the district is eroded by seasonal streams and rivulets. The early settlers, therefore, preferred to locate themselves in areas where they were assured of water supply through perennial *jhiriya*s and wells. History mentions the wells and the different water sources that the rulers of the areas created in their lifetime.

The community in each of the villages studied did not recall any instance where the inhabitants had experienced extreme water stress or had to migrate for short periods in search of water. According to the communities, the water sources had enabled them to sustain over long dry spells and delayed rains in the past. This situation, however, has changed over the past 15-20 years.

Present Sources of Water

The inquiry into current sources of water used for domestic purposes in the surveyed village generated data that is given in Table 3.2. The sources of water that have been mapped are the ones that are used in the normal course in the village.

Table 3.2 reveals that among the present sources of water there is a high degree of dependency on sub-surface and groundwater sources. The exploitation of groundwater for domestic purposes is evident in all the regions of the state, though at present this degree is lower in case of Dindori. In the villages studied the history of exploitation of groundwater is not more than 25 years old (the oldest handpump among the selected villages was in 1978).

As stored surface water source, ponds and lakes also exist in all the selected districts. However, in terms of prevalence, villages in Shivpuri and Dindori have a higher prevalence of ponds than in other districts. The water from ponds is largely used for *nistari*² purposes.

Table 3.2 Present Sources of Water in Villages Selected for the Study

Sources of Water	Bhind	Shivpuri	Shajapur	Raisen	Chhindwara	Dindori
No. of Villages	10	9	7	11	6	7
Surface Water						
River	2	-	2	3	4	5
Rivulet	-	-	4	1	1	-
Stored Surface Water						
Ponds & lakes	2	8	4	1	3	6
Sub Surface Water						
Wells	10	6	7	8	1	6
Bawadis	-	-	3	-	-	-
Jhiriya	-	1	-	1	2	7
Ground Water						
Handpump	10	9	7	10	6	7
Tubewell	6	9	1	1	4	-

² The term *nistari* is commonly used in Madhya Pradesh to express domestic use of water for other than drinking and irrigation purposes- bathing, washing, water for animals etc

The surface water does not appear to be very important as a water source to fulfill the domestic demand for water.

Comparison—Past and Present

During discussions with the community on the existence of water sources in the past and at present the data of both time periods were compared and the group was asked to identify and analyse the reasons for change in dependence on the water source over a period of time.

(a) Decrease in Dependence on Rivers and Rivulets

There were 25 villages (50 per cent) that were dependent on rivers as a source of water in the past. The number of villages reporting their dependence on water from rivers has decreased to 12 at present (24 per cent). In the case of rivulets, the number of villages has decreased from 11 (22 per cent) to 6 (12 per cent). The different groups in the community were asked to reflect on this decrease in surface water. The responses have been tabulated in Table 3.3.

According to the community, there are three factors that have led to a decreased dependence on rivers and rivulets: decrease in water as input; increase in the quantum of output (water drawn); and introduction of comfort technology (handpump) in the village. When the community was asked how the increase in sins have decreased the water in rivers they were unable to answer.

In addition to the above the study team observed that in the community's collective perspective it is the responsibility of the government to provide water to the households. The government in turn makes

this provision through handpumps or tubewells and not through rivers/rivulets. Hence, when the community demands facilities for water, they demand handpumps.

(b) Increase in Ponds and Lakes

It needs to be pointed out that the sample selected for the study was biased in that it selected districts and villages that have the problem of falling water table. In these areas ponds and lakes have been made with the aim of providing water for *nistari* purposes and to act as water bodies to recharge the water table. As a result of this, comparisons of the number of villages dependent on ponds in the selected districts reveal a higher dependence on ponds at present as compared to the past. This is more evident in case of Shivpuri, Shajapur and Dindori where the numbers of villages dependent on water from ponds have increased (impact of *Pani Roko Abhiyaan*).

(c) Sub-surface Water

The dependence on wells for providing water has increased in all the districts. The use and construction of new *bawadis* have been discouraged by the Government of India under the Guinea Worm Eradication Programme. Among other districts in the state this Programme was implemented in Shajapur. On the whole as water source the sub-surface water has maintained and even increased its importance for the communities.

Conclusion

At a wider level, it would seem that the water-source-mix of the villages would have gained on account of the increase in the ability to tap groundwater sources

Table 3.3 **Reasons for Decreased Dependence on Rivers and Rivulets as a Source of Water for Domestic Purpose**

District	Villages where the community was earlier dependent on river/rivulet but is not dependent at present	Reasons for decreased dependence on rivers/rivulets
Chhindwara	Gada Chota	<ul style="list-style-type: none"> Water drawn for irrigation through diesel/electric pumps Damming of water upstream and controlled release of water primarily for irrigation Decrease in forests/trees that have reduced water availability in rivers/rivulets Decrease in rainfall because of decrease in forest/tree cover Installation of handpumps and the comfort provided by it in terms of taking water at any time of the day Handpumps near the habitation hence less time spent in taking water for the household Sins have increased on earth (<i>dharti mein paap badh gaye hain</i>)
Shivpuri	Agarra Bhavkhedi	
Shajapur	Naharkheda Barai Rojadi Samri	
Raisen	Kharbai Mendori Bodhra Dhangawan	
Bhind	Didi Sarsai Bariyan Majpura Gata	

through the introduction of handpumps and tubewells. This is not the case always. The surface sources have become dry and are not being used at present to fulfill requirements of water for domestic purposes. The reasons are related to the competitive use of water for livelihood purposes (irrigation) and decrease in support structures (tree/forest cover) that would have ensured water availability throughout the year. That is, the perenniality of the rivers, a factor preferred by the early settlers, have been adversely affected and have been replaced with efforts to tap more of ground water.

3.1.2 Availability of Water

Each of the water sources identified by the villagers was mapped out in terms of the availability of water throughout the year. The source-wise information is given in Tables 3.4 A to D.

(a) Rivers and Rivulets

Among the sources of water, the rivers and rivulets that were perennial when the early settlers came and started the habitation have become dry at present, except in Dindori. The main reason for this particular water source changing its nature from a perennial source to a seasonal source is explained in the above section. The process of drying up is best exemplified in the case of Gata (see Box).

Stories similar to Gata have been narrated by the community in Shajapur, Chhindwara and Raisen. The fact is that there has been no regulation or formal mechanism to control drawing of water for irrigation in these areas. At Dindori the agriculture has not prospered (irrigated agriculture) to the level it has in other districts and hence the problem of perennial rivers drying up has not been experienced so far in the villages.

(b) Ponds

There are 61 ponds in the villages covered in the study. Locally these are referred to either as *talab* or *talai* depending on their size.

The water from the ponds in all the selected villages is primarily used for providing water for animals and other *nistari* purposes. However, due to seasonal character of this water source the problem of providing water to the animals persists in summers in all the villages surveyed. There are two examples in the present context that are noteworthy. One is that of Kerkui, where 23 ponds (*talai*) were constructed under the watershed programme. The study team was informed by the district rural development agency (DRDA) that the quality of work at Kerkui is such that all the handpumps in the village are overflowing with water. The village visit presented a contradictory picture where out of four handpumps three were closed and the only well was dry. The

Table 3.4A: Availability of Water in Rivers and Rivulets in Selected Districts

District	No. of Villages	Villages with Rivers or Rivulets	No. of Rivers/ Rivulets	
			Perennial	Seasonal
Bhind	10	2	-	2
Shivpuri	9	-	-	-
Shajapur	7	5	-	5
Raisen	11	3	-	3
Chhindwara	6	5	-	5
Dindori	7	5	5	-

Gata

Gata village is located in Mehgaon block of Bhind District. The village was established in 1256 near Besli river. These settlers used to use the water from the river which was able to provide water round the year. People from all castes would draw water from the village and there is no history where the village had at any time faced water shortage. Interestingly the wells near the habitation always had saline water where as wells at a distance of 2-3 kms from the village had sweet water.

Before independence (in 1940s) a dam was built on the river near Gohad that is upstream of the Gata village. After the construction of the dam there have been controlled releases of water, the need for which was guided by the need for irrigation. However, the extent of agriculture till 25-30 years ago was at a level that did not affect the flow and availability of water in the river.

With the advent of diesel and then electric motors it became possible for the farmers to draw water over a long distance as a result of which the river gradually became dry. There are no control mechanisms that determine the amount of water that a farmer can draw from the river. Consequently at present the river is completely dry during summers.

With the water in wells near the village being saline the villagers had to look for alternative sources of water. An attempt was made by the Forest Department to supply water through the pipe towards the Brahmin *mohallah*. The other caste people (*Parihar* who had no water source in their colony) were not allowed to take water. This was resisted and the net result was that the pipe line was permanently damaged.

At present there is one well near the river that functions as the popular source of water as it has potable drinking water. But due to shortage of water in summers most of the people go at night to fill water from the well. The economically well-off members of the village have employed persons (@Rs 800 pm) to get water from the agriculture fields (wells and tubewell) to their house.

Table 3.4B: Availability of Water in Ponds in Selected Districts

District	No. of Villages	No. of Ponds	No. of Ponds	
			Perennial	Seasonal
Bhind	10	19	-	19
Shivpuri	9	26	-	26
Shajapur	7	4	-	4
Raisen	11	3	-	3
Chhindwara	6	3	-	3
Dindori	7	6	-	5

village was getting water from the tubewell and one handpump at the time of survey.

Narwar village in Sanchi block of Raisen is located near a *talab* (approximate size 36 acres). According to the inhabitants of the village, till two years ago, the pond always had water throughout the year. The pond provided water for animals and was used by the villagers for bathing and washing of clothes. The water from the well near the pond was used for drinking water purposes. However people from the village started using pond water for irrigating their fields. This has led to a situation where the pond is dry by end of February and there is severe water crisis in the village during summers. The study team observed that the pond is also being encroached for setting up houses and for agriculture and if the trend is unchecked the water body will die soon.

(c) Sub-surface Water

There were 162 wells that were being used by the community to fulfill their requirement of water for various domestic purposes. These wells are in the public domain, that is, they were either constructed by the government or Panchayat or were private wells the use of which is open for general public. Out of these wells 45 per cent were found to be perennial at the time of study.

The community categorically asserted that the wells function as the buffer during times of acute water shortage. In all the villages the community was able to identify at least one well that has not gone dry so far (see Box on Samri).

Bawadis, as has been stated earlier, had been discouraged by the government under the Guinea Worm Eradication Programme. The old bawadis are still being used to provide water that in community's perception is cold and sweet (*sheetal hai aur meetha hai*).

Samri

Samri is located in Nalkheda block of Shajapur district. The village has a population of 450 persons belonging to Gujars, Brahmins, Scheduled Castes and Scheduled Tribes groups. The settlement pattern is such that the village appears as a compact unit located at a distance of less than 2 kms from Batan river.

There are five handpumps around the village to give easy access to the inhabitants. These handpumps become dry by Oct-Nov every year. The villagers have to walk 3 kms to the well that provides water throughout the year. According to the villagers it takes them 4 hours to procure and transport water to their houses.

There is one private *bawadi* in the village belonging to Bhagwan Singh. The water is potable and the *bawadi* is located in the village, but Bhagwan Singh does not allow villagers to fill water from his *bawadi*.

The villagers said that in their village even the guests have to go and fill water for their needs. Most of the time it is men who go to the well to get water for the household. The water is carried by them on bicycles in cans. The extent of water shortage is best expressed in the words of Prem Bai of the village who said that, "*ghee dhal jaye to man ma na lage, par pani dhal jaye to man ma lage*" (one will not mind too much if the *ghee* spills, but it hurts when the water spills)

Table 3.4C: Availability of Water in Sub-surface Sources of Water in Selected Districts

District	No. of Villages	No. of sub-surface water sources			Sub-surface water sources that are perennial		
		Wells	Bawadi	Jhiriya	Wells	Bawadi	Jhiriya
Bhind	10	106	-	-	46	-	-
Shivpuri	9	18	-	-	6	-	-
Shajapur	7	6	4	-	4	2	-
Raisen	11	11	-	-	0	-	-
Chhindwara	6	4	-	8	1	-	0
Dindori	7	17	-	19	16	-	14

There are two types of *jhiryas* that were identified by the study team. One is *jhiriya* that is dug along the river in monsoon and in the river bed during summers. By their very purpose they are seasonal in nature. The second type of *jhiryas* are those found in Dindori. These are dug 9-10 feet deep and made permanent by casing their sides with logs of sal wood (to prevent collapse). The local inhabitants believe that the wood has medicinal properties. In its traditional form the casing is square that is fitted in a round pit. The PHE Department has taken upon itself to convert these *jhiryas* into permanent dug wells by increasing the depth and by making concrete walls.

(d) Ground Water

There are 307 handpumps in the 50 villages covered under the study. Out of these only 53 per cent handpumps are perennial in nature. That is, these handpumps provide water throughout the year. The remaining handpumps have either been closed or become dry for a substantial part of the year.

Among the perennial handpumps (69) half of them have water but due to fall in water table it requires greater effort/time to draw water during summers.

Out of 122 tubewells only 45 per cent are perennial. The others have been closed down primarily because of fall in water table that had rendered the tubewells dry.

Conclusions

The data from the villages selected for the study reveal that the community fulfills its water requirements through a source-mix depending upon the seasonal availability of water in each of these sources. In most cases all such sources do not form part of the water sources developed by the formal

system (PHE Department) responsible for supplying water to the communities.

The Department's view is that it is impossible to recharge the dry sources. Hence the department focuses on identifying and accessing new sources of water. In most cases the current strategy of the department is to go deeper and tap more into ground water sources.

The perenniality of surface water sources (rivers/ rivulets/ponds) is under sustained pressure of providing increasing amounts of water for irrigation converting erstwhile perennial water sources into seasonal sources. The ground water sources too face competition for irrigation and in the absence of recharging structures they either become dead or

PRA Map of Village Samri showing location of Water sources



Table 3.4D: **Availability of Water in Handpumps and Tubewells in Selected Districts**

District	No. of Villages	No. of ground water sources		Sub-surface water sources that are perennial	
		Hand-pump	Tube-well	Hand-pump	Tube-well
Bhind	10	99	13	69	6
Shivpuri	9	47	6	30	5
Shajapur	7	53	2	14	2
Raisen	11	48	3	22	3
Chhindwara	6	36	88	14	40
Dindori	7	24	10	14	0*

Note: * All bore wells failed

Umri Kalan

Umri Kalan (Chhindwara) is a Panchayat headquarter with a population of 1150. The village traditionally used to get its water from the Wardha river and the 4 wells in the village. The PHE Department installed 5 handpumps in the village during the middle of 1980s.

In 1990 the first bore well was installed in the village. According to the community the handpumps went dry within a couple of years of installation of the bore well. Three more attempts were made to provide the village with bore wells. But all three failed.

At present the village is supplied water through one bore well (400 ft deep). All the handpumps have been closed as these sources have become perennially dry. The availability of water is critically dependent on the availability of electricity in the village.

For most part of the year the water needs of the village are being met by the river and through the well in across the river (in Maharashtra) and the *jhiryas* made near the river during monsoon.

Map of Umri Kalan showing location of water sources in different seasons



provide water seasonally. It is the sub-surface water sources, namely dug-wells that act as buffer (gap-filling) sources to make water available to the rural communities.

3.1.3 Accessibility to Water Sources

The physical accessibility to water sources is dependent on the social and economic accessibilities of different communities in the village. This factor was assessed during discussions with different caste and economic groups in the village.

(a) Social Accessibility

Water as a natural endowment is a common property resource. As long as it is consumed from its natural form – rivers, rivulets and ponds – it does not entail social dimension in sharing of the resource. This has been reported in all the villages that were selected for the study. The social dimension of water sharing – that is, division of water sources on caste lines – takes place in case of sharing of water from sub-surface and ground water sources. These water sources have exclusivity attached to them.

All the villages that were covered under the study were heterogeneous villages in terms of presence of different caste groups in the village. The discussion with different caste groups on the issue of social access to water sources took place in subdued tones. The people from the marginalised caste groups (scheduled caste, backward castes, and scheduled tribes) were not open and forthcoming in expressing their opinions and views and the persons in higher caste groups generally adopted politically correct postures. The data on actual usage of water by different caste groups was used to generate discussion on the issue of social accessibility to water sources. These discussions revealed the following:

- (i) as far as handpumps are concerned all caste groups want an exclusive pump within their

neighbourhood. In fact even the members of scheduled caste groups prefer a different source of water exclusively for them in order to avoid daily humiliation at the common water source (all districts)

- (ii) there is an understanding that in cases where same source provides water to different caste groups, the higher caste person will have the right to take water first. Also at the source the lower caste person will ensure that his vessel does not touch the vessel of the higher caste group (villages in the districts of Shivpuri, Shajapur, Chhindwara and Bhind);
- (iii) where animals are an important source of income for the higher caste groups, the animals will drink water first before the members of lower caste groups will be allowed to take water (Gudrawan, Shajapur)
- (iv) members of scheduled caste groups have used the provisions of Prevention of Atrocities on Scheduled Caste and Scheduled Tribes Act to assert themselves in accessing water from the source (Dhaulagarh, Shivpuri)
- (v) in case of piped water supply inability to pay for individual water connection has been used as the reason for providing community tap connections to the lower caste colonies (all villages with PWS except Mendori in Raisen)
- (vi) cutting of connection or non-release of water through pipes towards scheduled caste/tribe colony has been undertaken by the higher caste groups, especially during times of water shortages (Gudrawan, Shajapur)
- (vii) the caste lines become deeper during times of acute water shortage. The members of upper caste groups do not allow access to the members of the lower caste to common and private water sources within their neighbourhood or on their fields. Consequently the lower caste households have to access water source that is at a longer distance (Shajapur and Chhindwara)
- (viii) there is no parity in the location of water sources (handpump and well) on the basis of population in the village. The higher caste though less in number corner larger number of water sources (almost all villages more visible in Bhainsrawan (Shivpuri); Kharbai and Amgawan (Raisen);
- (ix) in the opinion of the lower caste groups it takes longer for the handpump in their neighbourhood to get repaired than it takes in the colony of the upper caste (Ajnol in Bhind and Agarra in Shivpuri)

(b) Economic Accessibility

The factor of economic accessibility comes into play directly when money has to be paid to gain access to a service or a facility, like tap connection for a

piped water supply or purchase of water from a neighbouring village. Indirectly the economic factor is also accounted for in the loss of wages that occur when the earning members of the households have to devote time and energy in transporting water to their house.

As a direct economic accessibility adversely affecting the poor to access better service is evident in Piped Water Schemes. In all such villages where the scheme has been implemented all the households are expected to pay an equal amount as contribution for getting the tap connection and a fixed sum of money as recurring cost. The principle of ability to pay as initial contribution and the amount of water consumed as recurring cost has not been applied. As a result the schemes have become inequitable in providing access to the poor households.

In villages where the water has to be transported from a longer distance the well-off households either employ a person to get water for their house (e.g. Gata in Bhind, Umrikalan at Chhindwara, Narwar in Raisen) or resort to buying water (Singodi, Sirata and Hiwra Prithviram at Chhindwara). This implies increased expenses for procuring water for the economically better households. For the poor this situation implies loss in wages as the earning members of the family have to devote almost half a day in getting water to the house.

Conclusion

The issue of social and economic accessibility comes into play with investments that lead to increase in comfort levels for getting water – well, handpump and piped water schemes. These investments are cornered by the socially and economically elite group in the village and the benefits in terms of services are also monopolised by them. The caste factor is used to assert the political supremacy and the economic factor is used to decrease the level and intensity of service to the economically and socially marginalised groups in the village.

Issues in Water – Sources, Availability and Accessibility

Perenniality to Seasonality

The historical water sources used by the community were perennial that have become seasonal at present due to over exploitation of water for livelihood purposes. The seasonality of these water sources has adversely affected the availability of water for domestic purposes for the households. The seasonality factor of new sources of water, handpumps and tubewells, are also visible as a result of the impact of the same forces that had made the traditional sources seasonal. The need is to understand the relationship between the competitive uses of water in the context

of the village while planning for water sources at the micro level.

Integrated Planning for Water Sources

It is apparent from the above data that discussion and planning for water for domestic purpose is not an isolated sub-sector anymore. The planning for water for domestic purpose will have to account for water use pattern for other competitive uses, especially for livelihood purposes. Sophisticated techniques of participatory water budgeting will have to be employed for developing water use plans for each of the uses. Similarly conjunctive use of different water sources for different purposes will have to form the strategic component of such plans. These are issues that need to get legitimacy in the policy as well as backed by appropriate regulatory mechanism.

Source Sustainability

The present trends of water use and the availability of water is indicative of and is borne out by the data as adversely affecting source sustainability. The formal system does not lay emphasis on recharging of water drawn from ground water sources as a result of which the numbers of such sources becoming dry are increasing. The choice is between additional costs of installation of another source vis-à-vis cost of appropriate technological interventions that effectively recharges ground water to ensure availability of water from the existing source. This is an issue that has not been reflected or given due importance in the policy for provisioning for domestic water for the households.

Social and Economic Accessibility

The current policy for the implementation of interventions for provisioning of domestic water is habitation centric. It does not take into account the social and economic dimension of such provisioning. The principles of ability to pay and payments as per usage have to be institutionalised to make the policies equitable and enable equity in accessing benefits by different economic groups in the village. In terms of social accessibilities, which are but a subset of the prevailing culture in the village, the IEC and mobilisation of the community towards fulfilling of basic human needs with dignity will form the core approach in implementation of programmes.

People's Coping Strategy

Water is a basic human need. Till recent past with no history of water shortage the communities were not concerned with the emerging patterns of water use. However, with water shortage becoming a regular phenomenon, community and their sub-groups have not been able to develop effective coping strategies to deal with these shortages. Their choice is to go further leading to loss of wages or to pay for water leading to higher cost for procuring water or

to tap seasonal sources (*jhiriya*) that have variable consistency in terms of potability of water. As a collective the communities have not been able to identify the core issues leading to water shortages nor their respective role in perpetuating these shortages. They are dependent on government for solutions that are temporary in nature and are often not equitable.

3.2 Demand and Consumption

3.2.1 Demand for Water

The study mapped the different purposes for which the households demand water and sought to quantify these demands. The information collected from the study villages has been tabulated in Table 3.5.

The major question that generated information for Table 3.5 that was asked during the focus group discussion and individual interviews was ‘what are the purposes for which the household require water and how much water does a household require for each purpose?’ The answers were given in terms of the vessel that is generally used for procuring and storing water. The capacity of the vessel was later converted into litres. Secondly, the information provided by the community was for one household that was later converted for one person/one animal.

The community was categorical that the demand for water should include the demand for water for animals and water required for cleaning of the house

Table 3.5 Demand for Water Purpose-wise

Purpose for which water is required	Quantity of water required (in litres per person/ per animal per day)
Drinking Water	8 (summers) 5 (other seasons)
Personal Hygiene	
a. Bathing	12 (for daily bathers) 20 (for occasional bathers)
b. Hand washing	4 (before and after meals)
c. Dental cleaning	1
d. Toilet	1 (incl. hand washing)
e. Shaving	1 (men only)
f. Washing clothes	10
Kitchen	
a. Cooking	1
b. Washing vegetables	1
c. Washing utensils	5
House Cleaning	30 (at least once a week/10 days)
Animals	
a. Drinking	20
b. Washing	40 (once a month)
c. Cleaning the stables	20 (week/10 days)

(lipai-putai). The latter represents demand for a purpose that is not conducted every day but has a periodicity that is important for the rural households. With respect to animals the households with livestock holding (cows and buffaloes) were categorical that the demand for water should include demand for water by animals as one person from the family is always involved in getting water for the animals and also that the drinking water for the animals is also secured from the same water source that is used by humans. Consequently these sources of demand were also included in drawing up the list of purposes for which water is demanded and quantification was also done for each of these purposes.

Thus according to Table 3.5 the demand for water by a person who bathes daily is 43 litres per day during summers and 40 litres for the remaining part of the year. Similarly, for the occasional bather the demand is 51 and 49 respectively. The additional daily demand for water for drinking purposes for one animal is 20 litres.

Conclusion

The figures given in Table 3.5 are the average and aggregated figures of all the 50 villages covered by the study. At the aggregate level the demand for water by the households seems to be similar to the entitlements defined in the government policy—40 litres per person per day. However, during discussions with different groups in the community it was apparent that more important than the quantum of water required for the household is the time and effort required for securing this water for the family. Hence for the community it is the comfort and the ease of procuring water that is more important than the quantum of demand *per se*. The comfort levels are defined by the vessels that are used for transporting water till the house and the distance-time of the day-slope through which the water is carried to the house. That is as important is the level of demand for water, equally important is to identify the location where the water is actually consumed.

3.2.2 Consumption of Water

The main responsibility for procuring water for the household is that of women in the family. The vessels used by women for carrying water are round and have to be carried either on head or on waist or both (Table 3.6). When men carry water they generally carry it in containers that are lifted or can be carried on a bicycle or bullock cart. Men are involved in transporting water to the house in cases (a) where the water source is so far that the household stores water for more than one day and hence has to procure water in substantial quantities (e.g. mostly in summers when nearby water sources are dry); and was observed at Samri in Shajapur where the water source is up to 3 kms away and it is men who normally get water for the house; (b) where a taboo is associated with the water source

(e.g. Umariya in Shajapur); (c) when the woman in the family is ill (e.g. all villages).

Since the main responsibility for getting water to the household is that of women the actual water available and consumed in the house depends on the ability of women to carry the vessels to the house. Carrying the vessels on head/waist over a long distance or through an upward slope is tiring and painful. In such cases the women carry the minimum possible water up to the house – for drinking and for cooking only. The remaining demand for water – bathing, washing clothes and utensils, and personal hygiene requirements are fulfilled in two ways: one, by taking the clothes and the utensils to the water source for cleaning; and second, by each person in the household going up to the water source for their daily ablutions. In villages where the river is nearby (e.g. Gudrawan, Naharkheda, Mohad, Gata, Gaheli, Ajnol etc) the community goes to the river (as long as there is water) for bathing and washing clothes. The utensils are taken up to the handpump for washing and cleaning. Other water sources that are used during the course of the year and where water from rivers is not easily accessible include dug wells in agriculture fields, *jhiriya*, and tubewells in agriculture fields.

Conclusion

Thus, the demand for water is met at different locations by the community. This implies that when the government reports that the minimum entitlement of 40 LPCD has been met for a particular village it does not specify where this demand is being met. The policy statement falls short of defining standards that also explicitly state that the entitlement of 40 lpcpd is to be met within a certain distance of the house throughout the year.

Table 3.6 **Vessels for taking/storing Water to/in the House**

District	Vessel Used for procuring/storing water	Capacity of the vessel in litres
Bhind	Ghada Balti	10-15 10-12
Shivpuri	Jer Gagariya Bhagona Balti	17 12-15 12-15 10-12
Shajapur	Behda Balti	18 10-12
Raisen	Gund Balti	10-12 10-12
Chhindwara	Gund Gagar Balti	10-12 15-18 10-12
Dindori	Ghada Kasedi	10-15 15-17

Issues in Water-Demand and Consumption

Demand and Entitlement

There seem to be loose ends in the policy for defining water entitlements in the government policy: the entitlement is for an individual person (40 LPCD) and the provisioning for water is for a habitation (one handpump for 250 persons). The demand from the community's perspective is for households as a unit that comprise of demand of water for animal and occasional cleaning of the house/animal. The need therefore is to bring the expectation (of the community) and delivery standards closer so as to make the approach driven by client expectations rather than on a theoretical understanding of the situation.

Location of Consumption

The policy of the government for provisioning of water specifies that a handpump be installed within 1.5 kms (plains)/ 500 m (hills). That is, the policy expectation is that the water will be consumed within this radius. However as the consumption data reveals that people have developed their own mechanisms to change the location of consumption depending on the availability of water in each water source the policy needs to recognise this and set delivery standards that categorically state that the entitled quantity of water for all the different uses of water for domestic purpose will be made available at the house or at the water source(s).

3.3 Quality

In Madhya Pradesh the quality of drinking water is affected by the presence of fluoride, salinity and iron in 4018 villages with 7746 sources in 22 districts of the state². The trends had suggested that the problem is on the rise and hence it was considered important enough to be one of the parameters for selection of districts for the current study. Consequently all the district selected for the study had problems of water quality in rural areas.

The aim of the present study was to explore the issue of water quality in greater detail hence the same parameter was used for the selection of the Block, the Gram Panchayat in each of the selected districts. The PHE department had suggested the name of the Block and Gram Panchayat that were known to be affected by water quality. The study focused on quality problems identified at the macro level, that is, fluoride, salinity and iron. Other contaminations like nitrates and/or bacteriological and other issues were not taken into account while selecting the study area.

² Water and Sanitation in Madhya Pradesh A Profile of the State, Institutions and Policy Environment, WaterAid India 2005

3.3.1 Prevalence of the Problem

The Table 3.7 provides information on the presence of the problem of water quality as suggested by the district PHE Department and found during the field visit.

The table below reveals that the study identified problems of water quality in villages (8 villages) that were otherwise categorised as normal by the department. The study found out the issue of water quality (by PHED parameters) to exist in more number of villages than was reported by the department. Thus one of the critical issues that the study identifies is the level of information and knowledge about the issue of water quality with the department in the selected districts.

3.3.2 Notions of Quality

The study discussed the issue of quality of water with the community. The discussions were centered on the major question of ‘what are the qualities of good water’ (*ache pani ki kya gunwatta hai*). The parameters

used and the expressions used to describe these parameters are given in Table 3.8.

In discussion with the community it was apparent that they had their own notions of quality of water and they were also able to express the same in terms of their impact on different uses. Whether the community is able to collect and use water of their preference is an issue more related to access and adequacy and the different types of uses for which they demand water.

3.3.3 Quality Monitoring

Since the PHE Department relies heavily on ground water sources the quality monitoring procedures observed by the study are related to quality monitoring of water from handpumps and tubewells only. The departmental procedures require that each water source be tested for quality immediately after drilling and before installation of the handpump/tubewell. Besides this the labs have to monitor the water quality of all the sources, but there are no departmental procedures that ensure that all drinking water sources be tested

Table 3.7: **Prevalence of Problem of Water Quality in Study Area as Suggested by PHE Department and as found during the Village Visits**

District/Block	Gram Panchayat	Problem of Water Quality (PHED)	Problem of Water Quality (village visit)
Bhind <i>Bhind</i> <i>Mehgaon</i>	Didi Sarsai Gata Gaheli	-None- -None- Salinity -None-	-None- Red deposit on storage* Salinity Salinity
Shivpuri <i>Shivpuri</i> <i>Pohari</i>	Dhaulagarh Sakalpur Bhainsravan Agarra	-None- -None- -None- -None-	-None- -None- Red colour water* -None-
Raisen <i>Sanchi</i> <i>Gairatganj</i>	Narwar Kharbai Pati Bhanpurganj	-None- -None- -None- Fluoride	-None- Iron -None- Fluoride
Shajapur <i>Susner</i> <i>Nalkheda</i>	Barai Naharkheda Gudrawan Berchakhedi	Fluoride -None- -None- -None-	Fluoride Bitter taste* Salinity -None-
Chhindwara <i>Amarwada</i> <i>Pandurna</i>	Singodi Babai Umarikalan Sirata	Fluoride -None- -None- -None-	Fluoride -None- Fluoride* Fluoride*
Dindori <i>Amarpur</i> <i>Mehadwani</i> <i>Samnapur</i>	Khajrimal Balpur Bargaon Kiwad	-None- -None- Iron Fluoride	-None- -None- Iron Fluoride

* This was as told by the village community

Table 3.8 Notions of Quality as Expressed by the Community

Parameter	Expression of quality
Taste	<ul style="list-style-type: none"> Water should be sweet (<i>Meetha hona chahiye</i>) Water not potable because it is bitter or salty (<i>pani kaseila/khara/feeka hai</i>) The water is so salty that a bird would die if it drinks water (<i>chidi maar pani</i>)
Temperature	Water should be cool (<i>sheetal hona chahiye</i>)
Odour	Water has a smell (<i>pani mein badboo aati hai</i>)
Effect on Cooking	Rice and dal are not properly boiled (<i>dal aur chawal theek se nahin galta hai</i>)
Colour of Rice	Rice when cooked becomes black (<i>chawal pakne par kala ho jata hai</i>)
Quenching of thirst	Water is not able to quench thirst (<i>pyaas nahin bujh tee</i>)
Colour of water	Water is red or yellow in colour (<i>paani lal/peela hai</i>)
Physical	Water has dirt/has presence of visible bacteria (<i>pani matmaila hai/pani mein keede hain</i>)
Washing of clothes	Clothes do not get clean/ clothes get torn (<i>kapde saaf nahin hote/ kapade phat jate hain</i>)
Deposits in water container	Water leaves white deposit in the container it is stored (<i>paani ka bartan safed ho jata hai</i>)

in a defined periodic cycle. As a result of this testing of water does take place, but the issue whether there are departmental procedures that ensure a quality monitoring system seems to be lacking.

The quality monitoring of water sources is also undertaken when there are specific complaints from the community or the department receives news of spread of epidemic.

The office of the PHE department in all the selected districts has a well-equipped laboratory for undertaking tests on quality of water. These labs were also found to be adequately staffed with qualified persons (Chemist and Lab Assistant). In the absence of facility for transportation the lab has to depend on the handpump mechanic for collection of water samples. It is only in specific cases that the Lab Assistant goes to the water source and collects the water sample himself. In Raisen due to widespread complaints of water quality the PHE department covered all the water sources for quality testing within a given time to assess the extent of the problem. However this was done only once and with the specific objective of determining the quantum of the problem and its location.

The quality report in the format is sent to the Executive Engineer's office with the values of quality parameters stated in it. The personnel working in the lab do not see any role for themselves in relation to the community (training, awareness etc), though they have participated in providing information about quality to handpump mechanics in the past.

The community has its own notions of quality. They do express and make distinctions between qualities of water from different sources. However by themselves they have also not instituted processes whereby regular monitoring of water sources takes place either within their own parameters or tested through the department. Other community

institutions or the Gram Panchayat have also not seen the issue of water quality falling within their responsibility domain.

The testing of water for quality does not address the issue of identifying causes that adversely affect the quality of water. For example the case of Singodi at Chhindwara where fluoride was detected as far back as 1986. Till the date of survey no sustainable solution has been found, nor have reasons been identified that have led to the contamination. The department takes the view that such a diagnostic study is beyond their scope of work and would instead require a much more detailed study best undertaken by specialised institutions.

3.3.4 Water Sources and Quality

The actual water sources used for drinking and other domestic purposes by the community are a mix of ground water, sub-surface and surface water sources (see Chapter on Water Sources). However the PHE Department focuses solely on testing of ground water sources developed by it. As a result a large number of functional and water sources under use are not tested by the department. The community/Panchayat have not taken any initiative in getting these water sources tested. This assumes importance during summers when communities dig temporary *jhiriyas* to fulfill its water requirements or take water from agriculture fields (dug wells or tubewells).

This was evident at Gata where community dug wells and private wells both have been affected by salinity. Since this is a factor that can be identified by taste the level of contamination is known to the community. But in case of fluoride (e.g. Sirata and Hirwa Prithviram) that can only be known through a chemical test. The water sources in private domain in the same village are not tested and hence contamination levels are not known to either the department or the community.

The responsibility of the PHE Department is to ensure safe drinking water for all at all times. This requires that the department should be aware of the functional water sources used by all at all times. These sources need to be then tested for quality and the safety measures of each source made known to the user(s).

3.3.5 Quality of Water and Usage

In villages that are affected by quality of water the community has developed its own mechanism of determining the best use that water of a particular quality can be put to depending on the nature of demand for water. For example, at Gaheli (Bhind) where there is problem of salinity the community makes the following distinction between different quality of water vis-à-vis its usage:

Drinking Water	Sweet Water (<i>meetha pani</i>)
Bathing	Sweet Water (<i>meetha pani</i>)
Washing Hands	Saline water (<i>khara pani</i>)
Shaving	Saline water (<i>khara pani</i>)
Toilet	Saline water (<i>khara pani</i>)
Cleaning of the house	Saline water (<i>khara pani</i>)
Washing Clothes	For applying soap sweet water and for rinsing saline water

3.3.6 Dealing with the Problem of Water Quality

The three water quality problems dealt with in the present study were related to fluoride, salinity and iron. The study inquired into and observed the process of how the problem has been dealt with at the departmental and the community level.

The PHE Department's first reaction for fluoride affected water sources is to close them. The Supreme Court order makes it the personal responsibility of the Executive Engineer to ensure that all such water sources are closed and the community informed about the presence of fluoride. The community on its part does not have a problem with the closure of handpump, unless the handpump is the only source of water for them. In latter cases the community resists the closure of handpumps and knowingly continues to drink water from the affected source. This has been observed at Mohad where the community has allowed closure of all handpumps except one, to serve as the only source of drinking water. The community at Singodi also knowingly continues to drink water from affected source since alternative source of water supply has not been assured to them.

The department has developed models to deal with the problem of iron. At Raisen this model has been kept in the PHE office as a demonstration unit. The model has however not been implemented in any of the villages affected by iron. The department informed the study that a project for the installation of the model has been prepared and is awaiting sanction from the state.

There is no known solution to deal with salinity (of the level at Gata). The water sources have not been closed, though attempts have been made to develop alternative sources of water in the village.

3.3.7 Safe Drinking Water

The safety standards for drinking water adopted by the PHE Department have been specified by the Bureau of Indian Standards. These standards include a range of parameters that reflect the chemical,

Table 3.9 Value of Quality Parameters at Village Singodi (between Oct 2002 to Feb 2003)

Village/Source	Fl	Fe	S	pH	Hardness	Cal Hard	Salinity	TDS	Turbidity	Temp	Potability
Handpump											
Bus Stand	0.2	1.6	-	7.3	816	-	-	1210	2	20	No
Jain Mandir	11.87	0	-	7.5	88	-	-	220	3	23	No
Nag Mandir	7.5	0	-	8.5	80	-	-	250	1	20	No
Kabristan	1.05	0.72	-	9.5	80	-	-	130	3	-	Yes
HS School	1	1.2	-	7.3	80	-	-	230	2	-	No
Dug well											
Ram Mandir	0.4	0.6	-	7.9	640	-	-	1230	2	21	Yes
River	0.22	0.8	-	7.8	160	-	-	290	2	24	Yes
Tubewell											
Raja Jain Farm	10	0	-	9.5	24	-	-	260	4	22	No
Khakra Road	12	0	-	9.5	80	-	-	260	1	20	No
Ropta	10	0	-	7.3	160	-	-	220	3	-	No

Note: Fl = Fluoride; Fe = Iron; S = Sulphate; Cal Hard = Calcium Hardness; TDS = Totally Dissolved Solids; Temp = Temperature
Source: Water analysis Result and Report, Amarwada and Harrai Block, by NEER Pollution Consultancy

bacteriological and physical characteristics of water. The testing of water by the Department includes testing of this entire range of parameters which are also reported to the line functionaries of the department. However, the focus of the line department is primarily on three parameters (fluoride, salinity and iron). Other parameters like pH value, hardness, nitrates, etc are not given enough importance whereas these parameters are equally important as they have implications for health of the consumers. For example, the PHE Department data of village Singodi is a case in point. The department had tested 10 water sources in the village. The shaded portions represent the values that are well above the acceptable limits.

The Table 3.9 reveals two critical aspects of quality: (a) the differences in level of contamination between different sources. For example the range of fluoride found in different handpumps is quite high; (b) the factors that are making the water unsafe other than fluoride, iron and salinity are pH value as well. For example the handpump at Kabristan has a pH value of 9.5 that is beyond the acceptable levels yet it has been declared potable in the report. Similarly the value of hardness of the dug well at Ram Mandir exceeds the acceptable limits yet the water has been declared potable in the report.

3.3.8 Quality and Water for Animals

Given the importance of livestock in an agrarian economy, the study inquired into the problems of quality of water specifically for animals. The study found out that households are equally concerned about the quality of water for their animals as they are for their family members. The households that run dairying provide water to the animals from the same source as for their households. Ponds are the most common source of drinking water for animals (and also cleaning them) at the time of grazing. While tying them for the night the drinking water source used by the households is also used for animals.

At Mohad (Raisen) and at Singodi, Sirata and Hirwa Prthviram (Chhindwara) the study team observed that the humans are drinking contaminated water and are also providing the same to their animals. In cases where the humans have a choice between safe water and contaminated water they are providing safe drinking water to the animals. In fact at Gata where the water has high levels of salinity the village community gives water from the same source to the animals as they take it for their households. In fact the team observed and experienced that as soon as a person would climb the platform of the well the cows/buffaloes of the village would immediately converge on the well to demand water. The villagers at Gata reported that the number of animal deaths in their village every summer is higher than the general deaths in the area. The main reason for this is the

non-availability of safe water for animals. Similarly at Gaheli (Bhind) affected by saline water the villagers report that the incidence of stomach related diseases is high which is also adversely affecting the yield of milk in animals.

The current policy of the government of availability of safe drinking water is for humans only. It does not address the need for safe water for animals. The village community on the other hand does not make this distinction in determining the entitlement. As a result even if PHE Department makes provision for safety for the humans the total demand for this water will also include the demand for water by animals also. Thus, this is an issue that requires further exploration, understanding and dialogue with the PHE department and a reassessment of the current policy on water.

Issues in Quality of Water

Water Quality Surveillance

The current state of testing for water quality is solely dependent on the PHE Department. The community or any of the institutions of local self governance are not involved in the testing of water or as consumers of the test reports. On one hand it creates pressures of numbers and coverage for testing on the department, and on the other, it does not provide community with information that has direct implications for their health and well being. The processes and procedures for water testing are based on random sampling methods and on expressed complaints. As such there is no regular monitoring system for testing quality of water. As a result not all water sources are tested at regular intervals and neither a profile of water quality developed for the villages/Panchayats.

Developing mechanisms where the people or their representatives undertake the responsibility for water testing at their own level and are part of the overall water quality surveillance system needs to be developed. The Panchayats can play a critical role in analysing the test reports and planning for water sources in their villages.

Disclosure of Information related to Quality

During the course of the study the research team experienced that the department was not willing to share the test reports. At best the team was asked to copy the test results from the registers kept in the lab.

The test reports are not sent to the Panchayats or any user group in the village. In their current form the reports are not comprehensible to an average reader as they do not specify the acceptable limits for each parameter. The department is expected to mark the water sources with symbols that are supposed to warn the consumers of the state of water quality

of the source. The department on its part has not made these symbols popular and the community has not heard or is aware about the meaning of these symbols.

A widespread programme on the issues of quality and the representation of problem parameters through symbols and colours should be developed so that the consumers are alerted of the dangers of consuming contaminated water.

Functional Water Source

The use of water sources have the factor of seasonality attached to them. Some of these sources fall within the private domain. The need is to map all the functional water sources (actually used) in the village and a water quality monitoring cum surveillance system set up for them. The department has to expand its focus from departmental water sources to actually used water sources to enable the community to achieve its entitlement of safe drinking water at all times.

Alternative Before Closure

The current practice of immediately closing the water source before creating a viable alternative for the community is a potential area of conflict. It also creates an impression that the community is resisting closure. The fact is that the community is equally concerned about the quality of water and is willing to shift provided an alternative is created. There is a need to advocate strongly for developing systems and procedures as soon as a water source is found to be contaminated at levels that are beyond the acceptable limits of potability and safety. The responsibility for the alternative should be the top priority for the department and there should be loose funds available with the department to arrange for such alternatives (even if it means transporting water through the tanker in the short period).

Safety Standards

The issue of water quality should be addressed on all parameters – chemical, bacterial and physical. There is need to educate the community and draw parallels between their notion and the chemists notions of quality. This can form an important component of the IEC messages and can be contextualised within the quality problem of each village.

Drinking Water for Animals

The tendency to view drinking water needs of humans and animals differently does not work out in an economy where animals have a definite role to play. The discourse on safe drinking water for humans have to include and develop standards where the animals, at least those that are used for draught and dairying purposes, are included in the entitlements and rights issues. The dangers for not including the

needs for animals have implications where the access of the poor and the marginalised for safe drinking water sources will be adversely affected at the cost of providing safe drinking water to animals (as explained in the section on access).

Water Quality and the Poor

The health implications of consumption of contaminated water have serious economic consequences for the poor. Apart from the loss of wages on account of diseases that have a higher strike rate amongst the poor, there are additional expenditures on fuel (as the food takes longer to cook) and on soap/cleaning agent (as more is required for cleaning of clothes and bathing).

3.4 Water Supply

Piped Water Supply scheme implies a distribution network of pipes through which water for domestic purpose is supplied through a spot source that may be located within the house or in the community through taps. The present study found out that such schemes existed in 17 of the 50 villages surveyed. This section deals in detail on the implementation and maintenance of the schemes in these villages.

3.4.1 Description of Scheme

There are two types of schemes that fall within the category of Piped Water Source: one, where water is drawn from a motor and supplied directly to the spot sources; and second, where the water is first drawn and stored in an overhead tank and later supplied to the households. These schemes were not in any of the villages surveyed in Bhind and Dindori districts. Among the study villages there were 10 villages that fell into the first category and seven villages that were in the second category (Table 3.10 and 3.11).

The 11 villages with PWS without the OHT were located in Shivpuri and two of the sector reform districts – Raisen and Chhindwara. Among these ten villages, six are Gram Panchayat headquarters, namely, Barai, Bhanpurganj, Sakalpur, Bhainsrawan, Babai and Umrikalan.

There are wide variations in the populations of the villages that have been covered under the Piped Water Scheme (270 to 1500). The three villages with population less than 500 are in Raisen district and there were specific reasons for choosing these villages for coverage under a piped water supply scheme (see Box on Mohad, Sagor and Bodhra).

The cost of the schemes listed in Table 3.10 range from Rs 4 to 12 lakhs in case of Sagore (Raisen). Most of these schemes have been implemented in the villages after 2000.

Table 3.10 Description of PWS in Villages without the Overhead Tank

Villages	Population	Source of Water	Number of Connections	
			Private	Community
Raisen				
Mohad	300	Well	Incomplete	
Sagore	400	Well	Incomplete	
Bhanpurganj	750	Well		
Dhangawan	600	Well		
Bodhra	270	Well	Incomplete	
Shajapur				
Barai	2560	Tubewell	-	3
Shivpuri				
Sakalpur	693	Tubewell	40	5
Bhainsrawan	1500	Tubewell	-	8
Chhindwara				
Babai	1500	Tubewell	40	2
Hirwa Prithwiram	1100	Tubewell	40	10
Umrikalan	1150	Tubewell	50	10

The PWS schemes with OHT are implemented in Gram Panchayat headquarters with the exception of Mendori which is part of Kharbai Gram Panchayat. The villages are large in terms of population (ranging between 1200 to 4300) and the cost of implementation varies between Rs 4 lakhs (Singodi) to Rs 16 lakhs (Narwar). With the exception of the scheme at Singodi all the schemes have been implemented during 1999-2002. The scheme at Singodi had been implemented in 1981. All the schemes were found to be functional at the time of the survey.

Issues in Piped Water Supply

Water Source

The source of water for the PWS is tubewell except in case of schemes that have been implemented in Raisen without the OHT. In case of latter the issue of water quality of ground water source has been an inhibiting factor in using tubewells for providing water. An interesting case is that at Gudrawan in Shajapur. At Gudrawan water is drawn from the river and put in a well. Later this water is again drawn from a motor and supplied to the households.

Tubewell as the main (albeit the only) source of water for PWS schemes implies that sooner or later the source will go dry and it will involve deepening of the source or drilling of another tubewell (see Box on Singodi). That is, the functioning of the scheme will demand additional investments over a period of time which is not built in at the time of designing of the scheme. These additional funds will have to be secured from the department and till such funds

Mohad

Mohad has 33 households and was fulfilling its water supply needs through handpumps. All the handpumps of the village were identified with fluoride contamination. To create alternative source of water supply the PHE Department decided to dig a new well in the village, draw water from a motor and supply water to all the households through pipe connection. The network of pipes was laid down but the dug well did not yield water. At the time of survey money was being mobilized from DPIP project to dig another well in the village and connect the pipeline through this well.

Sagore

All the handpumps in Sagore had gone dry. In fact the village did not have any source of water. The PHE department designed a scheme to draw water through a motor from a well in Silli, the neighbouring village, and transport it by means of a pipe line (4000 ft) to provide water through spot sources in Sagore. The scheme was sanctioned but due to shortage of funds the entire pipeline could not be laid down. At the time of survey the villagers were getting water from the well in Silli at a distance of 2 km.

Bodhra

The water level of handpumps in the village had decreased. As an alternative PWS scheme was designed and water was to be drawn from a well. The scheme is incomplete because the money for pump house has not been received, though the community believes that the money had been released and has been siphoned away.

are forthcoming the scheme will be non-functional, representing a failed investment.

The design of PWS scheme is an opportunity for developing mechanisms for conjunctive use of ground and surface water. This opportunity has neither been visualized by the community nor the technically equipped engineers of the PHE Department.

Singodi

The Piped Water Scheme at Singodi was implemented in 1981 when the population of the village was 2700. The scheme functioned well till 1986 but then the bore went dry. A new bore was drilled but the water was detected with fluoride. The water from the third bore was not potable. Since then the village has a history of drilling new bore wells that become dry in a short period of time. During the study an attempt was made to calculate the number of bore wells that were drilled in the village. The conservative estimate puts the number at 60 and the average estimated number of bore wells that have been drilled in the village between 1990 to 2000 are 70. At present PWS supplies water once in 15 days for half an hour. At present water is being supplied through tankers the cost of which is borne by the Panchayat.

In 1986 the handpumps in the village were detected with fluoride. The government was able to successfully close some handpumps. At present there are 4 handpumps in the village of which only one provides water throughout the year. This handpump has potable water. Out of these one handpump is affected with fluoride, the closure of which was resisted by the community.

The community gets its water from private wells in agriculture fields and from *jhiriya*s made in the river bed.

Upgradation of PWS

At Barai (Shajapur) a PWS with distribution through spot source has been implemented since 1999. The scheme sourced water from a tubewell located at a distance of 500 m. During summers there is not enough water and the PWS was unable to fulfill the water requirement of the community. Barai has been declared a Gokul gram in the past one year. The assessment of PHE Department categorically states that during summers there is no water either in the tubewell nor in any of the handpumps as the water table being low, the water depletes further making these sources dry.

The Gokul gram planning for the village by the PHE Department proposes to upgrade the scheme to a PWS with a overhead tank. The total cost of the scheme is Rs 17 lakhs and it will construct an overhead tank with a capacity of 1 lakh litres. The water will be drawn by drilling one more tubewell near Kali Sindh river 1 km away. The new source will be combined with the existing source and it will require pumping for 14 hours for the overhead tank to be filled.

The proposal of the department has projected the population for the year 2034 (28 years hence) and proposes to provide 70 lpcpd to the inhabitants. There is no assessment of the fact the if at the current rate of consumption the water sources are going dry then how will the sustainability of the water source will be maintained till 2034!

It seems that the department has not undertaken a proper assessment of its existing schemes nor does it have a vision or a strategy to upgrade the existing schemes that have a better option of ensuring water without raising expectations and cost of supply to the community.

Table 3.11 Description of PWS in Villages with Overhead Tank

Villages	Population	Source of Water	Number of Connections	
			Private Community	
Raisen				
Narwar	4000	Tubewell	150	10
Kharbai	1200	Tubewell	50	5
Mendori	350	Tubewell	40	-
Shajapur				
Gudrawan	1400	River & well	350	7
Shivpuri				
Dhaulagarh	3500	Tubewell		
Chhindwara				
Singodi	4300	Tubewell	350	
Sirata	2400	Tubewell	250	2

Dependence on Electricity

The success of PWS depends entirely on availability and quality of electric supply. This is more so in case of PWS without the OHT, because water can only be supplied when there is electricity. In all the villages the main complaint of the community was the irregular supply of electricity and its impact of regular and timely supply of water. Only at two villages, Gudrawan and Bhainsrawan, the scheme made provision for a generator set. But again at Bhainsrawan the community did contribute towards the cost of purchasing diesel initially, but due to high cost of operating the set the contributions from the community were stopped.

Distribution System

PWS is primarily a system to distribute water to the community. Its effectiveness needs to be measured in terms of its ability to provide water as per entitlement and by maintaining social and economic equity in distribution.

(a) Water Entitlement

Does the Piped Water Supply ensure the water entitlement of 40 lpcpd? Going by the capacity of overhead tank the following are the requirements of the community:

Thus it is only at Mendori that the water entitlement of the community is fulfilled. At other villages there is a shortage of water that ranges from 18 thousand to 1 lakh 22 thousand litres. This inability of PWS to ensure entitlement of water has a direct impact on the issue of social equity as is explained below.

(b) Social Equity

In all the 17 villages, with the exception of Mendori (Raisen), water through the PWS system is not supplied to all the households or the colonies. This indicates inequity in the distribution network designed for the village. In all the 16 cases, the study found out that the groups that are left out belong to the socially marginalised community – scheduled caste, scheduled

tribe or the backward caste households/colony.

The issue of social inequity raises the following basic questions

- (i) Whose demand is being met through the PWS?
- (ii) Why should government subsidise water distribution for some caste groups only?
- (iii) What was the level and intensity of community mobilisation and their preparedness at the time of designing and implementing the PWS scheme?

It seems that the demand for PWS is from the upper caste elite and when it is met they tend to monopolise the distribution for their own benefit. The current situation of PWS as has been experienced by the study has policy implications. In its present form the PWS scheme is village-centric in contrast to other sources of water that are habitation-centric (like handpump). The government needs to review its policy and determine whether different interventions for provisioning of water in rural areas will have different bases for their design and implementation. As a common property resource adequate supply of water through a mechanism that reduces drudgery for its collection is a right of all socio-economic groups. The policies of the government should not allow the elite to corner the resources for their exclusive benefit. Such trends, if left unchecked, will violate the rights of the marginalised and will work towards deepening of caste divisions in the villages.

(c) Economic Equity

One of the preconditions for the implementation of PWS in the village is that 10 per cent of the total cost of the scheme will have to be borne by the community. The community contributes by way of cash or by way of voluntary labour. In most cases the study found that fixed charges were levied for each household connection (average amount Rs 500 for each connection). The amount thus collected is deposited as the community contribution. In case this amount is less than the required 10 per cent, then either the elite group of the village contributes larger

Table 3.12 Capacity of the Overhead Tank to meet the Water Entitlement of the Population in Villages with PWS with Overhead Tank

Village	Population	Total Required @ 40 LPCPD	Storage Capacity of Overhead Tank	Deficit in Terms of Required LPCPD
Gudrawan	1400	56,000	25,000	31,000
Narwar	4000	1,60,000	65,000	95,000
Kharbai	1200	48,000	30,000	18,000
Mendori	350	14,000	30,000	Surplus
Dhaulagarh	3500	1,40,000	75,000	65,000
Singodi	4300	1,72,000	50,000	1,22,000
Sirata	2300	92,000	45,000	47,000

Sakalpur

Sakalpur, established around 200 years ago, at present is dominated in numbers by Dhakads followed by Rawats. Other caste groups in the community include the Sikhs, scheduled tribes, scheduled castes and Brahmin caste groups.

Dhakads and Rawats live together in a heterogeneous colony. This is the area that housed the original inhabitants of the village. The houses of Sikhs appear as an extension of the original habitation. The houses of Sikhs are not as compact as that of the Dhakad and Rawat mohallah. The houses of scheduled tribe are on the fringes of the Sikh mohallah and then extend to form a separate cluster of their own. ST and SC are treated as persons belonging to the lower castes and they do not mix with other caste groups and their houses are located outside the main village.

One tubewell has been installed to pump water to supply piped water to the village. The water from is supplied to spot sources in the Rawat and Dhakad mohalla. The pipelines towards the ST and SC households have not been laid.

Gudrawan

Gudrawan has two major caste groups the Patidars and the scheduled castes. The design of the PWS included laying of pipelines to the mohalla of both the colonies. Once the PWS became operational the Patidars managed to provide water for 8 days in the first two months. After that the scheduled caste colony has never received water through the pipes. The Panchayat was allotted funds for laying of cement road in the village. The Patidars managed to lay the cement road in such a way that the pipe connection of the scheduled caste colony was buried under the road to permanently cut-off the connection. Instead the pipe line has been going towards the scheduled caste colony has been diverted to the agriculture fields of the Patidars.

amounts or if the community has political connections it accesses funds from their local representative under MP/MLA Local Area Development Fund.

The households that are unable to give contributions for tap connection are asked to deposit the amount as a group. In such cases a common tap connection is provided for the colony. In all the 17 cases, except Mohad and Mendori, the houses belonging to Scheduled Caste and Tribes and other Backward Castes were unable to contribute the required amount and were therefore given only community tap connections.

After the implementation of the scheme fixed charges are levied for each tap connection. The study found out that the charges vary between Rs 30 to Rs 75 (Mendori) for one tap connection per month. These

charges are expected to cover the fixed cost of running the motor (electricity/diesel), the cost of employing one person to operate the motor/ valves, undertake general maintenance of pipeline in case it is broken, and to cover the cost of maintenance and repair of motor.

The study found out that by and large the households that have the tap connection are paying the amount fixed for each tap. The problem is in case of recovering charges from community taps. In all the cases no one person or group has the responsibility for making payment for community taps. As a result as soon as there are conditions of water shortage the connection to community taps is cut off on grounds of non payment. This sets a cycle of no payments because no water is supplied; and no water will be supplied because no payment has been made. Again the losers are the socially marginalised and economically poor groups of the village.

(d) Conflicts

Procuring water through PWS has given rise to a new area of conflict within the community at least at two levels. One, within the colony of elite groups where some households that get water for shorter duration on account of low pressure have installed tullu pumps adversely affecting the availability of water for downstream households. Second, in determining 'who-will-take-how-much' water from community taps, especially where the water from tap is dependent on (uncertain) availability of electricity.

Thus as a distribution system the way PWS has been designed and implemented in the state it falls short of the principles of ensuring socio-economic equity for the poor and the socially marginalised sections of the population. The problem seems to be in relation

Narwar

Narwar is located on the main road from Raisen to Sagar. The houses in the village are located on a steep hill. Prior to the implementation of PWS the households used to get water from a community well located at the bottom of the hill and physically take the water through the steep slope to the house. The drudgery of taking water up to the house had reached such proportions that eligible bachelors from the village were unable to find brides as the parents of the prospective bride would not prefer to give their daughter in a village where she has to secure and transport water on steep slopes.

The first month the PWS became functional there were conflicts related to 'whose turn' and 'how much water' will each household take. The conflicts were violent and it is reported that 26 FIRs were registered in the nearest Police Station related water disputes in the first month of implementation of the scheme.

to inadequate consultation with different groups in the community leading to low level of community preparedness in adopting and designing the scheme for the benefit of all the groups in the village.

Impact on Sanitation

PWS has had a positive impact on construction of private latrines in villages. The study team found out that the households that have a tap water connection within the house have gone in for construction of toilets within their premises. Since the private tap connections have been taken by the better off sections of the population the benefit of private latrines has also flowed to these groups in the village. The households belonging to the poor and/or the socially marginalised have not been able to take benefit from PWS in installing toilets within their houses. Mendori (Raisen) however is an exception to this where all the households have installed toilets within their premises. The three houses of Scheduled Castes that are remaining had dug their pits and were awaiting receipt of cement to construct the platform.

The relationship between PWS indicates the critical relationship between easy and assured availability of water and preference of the households to go in for construction of private toilets.

Sustainability of the System

The sustainability of the PWS as a system has been assessed in terms of institutional, financial and source sustainability.

(a) Institutional mechanism

The implementation of PWS was to be done through the Health Committee of the Gram Sabha (formed under the Madhya Pradesh Gram Panchayat and Gram Swaraj Act, 1993). The committees in the villages opened their own account and spent funds for the implementation of the scheme. The functional maintenance and the operation of the scheme after its implementation was also the responsibility of the Health Committee.

At the time of survey the study found out that in all the villages the responsibility for the operation and maintenance of the PWS in the village is that of the Gram Panchayat. The Health Committee had worked initially during the design and the implementation phase but after implementation the Gram Panchayats have taken over. As such the writ of the Sarpanch runs and he is the sole decision maker for any aspect of the scheme (getting the motor repaired, contacting the PHE department for deepening the borewell, deciding on whether the connection should be cut/restored, etc. The households make payments to the Gram Panchayat for which they also receive a receipt.

(b) Financial

The discussions with the groups in the community and Sarpanch had revealed that the households do not automatically pay money for water every month. The households (in all caste groups) complain that they are willing to pay only if they get the assured supply of water in time. In case there is a shortfall in either of these conditions (no electricity, falling water table and hence less water etc) there is unwillingness on part of the household to pay the due amount.

In cases where neighbours take water from a private connection such number of households share the cost of one private tap (e.g. Kharbai). This in turn reduces the potential for revenue collection as more than one household collects water from a private connection.

The issue of regularity of payment gets complicated in case of community taps. Here the households are unwilling to share the cost of common tap though they agree that it is a facility that is beneficial as it reduces drudgery and the time taken for water collection. This is true for households that are in the beginning of the line, but for those who come later they are not (always) able to get water to fulfill their requirement nor does it save time for them.

The accounts of the PWS schemes are not maintained regularly as a result of which it is difficult to assess whether these schemes are financially viable. But an important fact that emerged from discussion with the community is that it is the elite and the well off in the village that have greater stakes in the running of these schemes. Hence they are willing to pay additional sums of money to repair the motor or to pay electricity dues so that the scheme is operational. This is so because in its absence the burden of work of women folk of these houses will increase. As a result in almost all the villages where the scheme is operational there are instances where the well-off households have put in extra money to ensure that the scheme is functional – repair of motor (Dhaulagarh), loaning of motor (Sakalpur), using administrative-political connection, etc.

In such a scenario it is difficult to conclude that the scheme is financially sustainable.

(c) Source Sustainability

In almost all the cases (except specific cases in Raisen) the water for the PWS is drawn from ground water sources through a tubewell. It has also been experienced that sooner or later this source becomes dry necessitating additional investments in new bores or deepening the existing bore. At none of the villages studied was there an attempt to install water recharging structures near the borewell. Neither the schemes were designed to make conjunctive use of surface, sub-surface and ground water. There

is excessive and sole reliance on ground water that indicates the non-sustainability of water source even in short term.

Devoid of integrated planning in terms of different sources of water sustainability of water source cannot be ensured in the implementation and operation of Piped Water Schemes.

(d) Quality of Water from the Source

Since the PWS rely heavily on ground water, any contamination of ground water will seriously impair the availability of water for a large number of households as has been the case in Singodi. Going deeper would imply tapping into fossil water and going further will entail additional costs. Secondly, the ground water provided through the PWS is raw untreated water. It should be consumed within 36-48 hours after it has been drawn from the tubewell or it will not be safe for drinking purposes.

(e) Quality of Water and Cost of Maintenance

The chemical quality of water has an impact on the costs related to maintenance of the distribution system. For example, dissolved solids containing excessive sodium salts contribute to corrosiveness and pitting properties. Similarly the presence of iron above 1 mg per litre. leads to deposition of iron sediments in the pipe line and encourages growth of micro organisms leading to complete blockage of pipeline within a short period. The rusty iron particles in turn increase the turbidity of water. This issue has not been discussed either at the community or the departmental level. Neither has it been built into the design and budgeting of the PWS schemes. Given the trend in deterioration of quality of water in the state this aspect is likely to gain in significance and will have cost implications for the consumer.

Thus in its current state the PWS as a distribution system falls short on account of shortfalls in source and financial sustainability. The risk of ground water contamination and its impact on maintenance costs further impairs the sustainability of the system.

Corruption

In at least 6 out of the 17 villages that had implemented the PWS there were subdued voices pointing towards the Sarpanch/Adyaksh of the Health

Committee and some of the officials in the PHE Department were hand in glove and had siphoned off large amounts of money. The present study was not conducted in an evaluation mode nor was it its mandate to probe on financial propriety of the implementation of PWS, but the wide spread complaints that were received and were brought into discussion makes it imperative that they at least deserve a mention as such complaints/accusations are also indicative of lack of transparency in decision-making and accounts. However, the issue of corruption has also been identified by other studies that have been conducted by government (see Box on Report of Review Mission).

Report of Review Mission on Sector Reform and Total Sanitation Campaign Projects in Raisen District in Madhya Pradesh

(28-31 December, 2003)

“By and large well maintained records and documents were observed (except in Narwar village in Raisen Teshil). Random checking the pass book: A/C No.313/02 dated 30.4.02 revealed at times huge amount of money Rs. 1,00,000/- were withdrawn in cash without reflecting in the Ledger and Cash book. On a query from Team 2, it was reported by the husband of the chairperson of the VHC and Secretary of the VHC that the above money (Rs.1,00,000/-) was utilized to make cash payment to Zindal Brothers, Indore, Branch Raisen on 02.07.2003 as part payment against their Bill No.1086 dated 02.07.2003 for RS.2,56,000/-.The Team 2 wanted to see the receipt and reflection of this payment in the Ledger Book and Cash Book but was disappointed to observe that such huge cash truncations were going on for purchase of pipes without obtaining receipts and reflections in Ledger and Cash Books. Similar observation was made for another payment of Rs.5,500/-against Bill No.1087 dated 02.07.2003 for Rs.5,500. These observations of the team were brought into the notice of the Chairperson of the DWSM/DWSC and Collector of the Raisen District as well as into the notice of the Principal Secretary, PHED and the Project Director, SRP/Swajaldhara to look into the matter for appropriate action.”

Sanitation

4.1 Private Toilets

Data with respect to private toilets in the 50 villages covered under the present study is as follows:

- There was only one village where all the households had constructed toilets and were also being used at the time of survey – Mendori, Raisen
- In 30 villages only a small proportion of households had individual toilets. In 5 of these villages the number of toilets was between 2 to 15.
- 19 villages had no toilets.

The toilets that have been constructed in the villages have been in two types of households – the houses that have been given assistance under the Indira Awas Yojana or the Total Sanitation Campaign and houses that have constructed toilets on their own account. The latter belong to the economically well off members of the village.

The study conducted discussion with community groups to ascertain the reasons that inhibit the households to use toilets after construction. The factors that were articulated are as follows:

- At Dhangawan in Raisen pits have been dug by households under TSC for more than a year. They have not received the promised funds and on their own they are unable to complete the construction.
- At Bargaon in Dindori 115 toilets have been constructed under the TSC campaign. The village has been recognised as the Gokul Gram and hence is being paid more attention for the past one year. The toilets have been constructed without the super structure and are not being used. Only the Muslim families of the village are currently reported to have been using toilets. Other households have kept bricks on the seat to prevent dirt from going in.
- At Ajnol 5 toilets have been constructed but are not being used due to shortage of water
- At Gudrawan 24 toilets have been constructed under Indira Awas Yojana but are not being used. The households are using toilets as an additional room to store various items. The main reason for not using them as toilets was – pit has not been made properly, water not available, gives foul smell etc.
- At Barai in Shajapur 35 toilets have been constructed but not being used as the people feel that using the toilets will make their house dirty.

The main reason for not using toilets after construction were thus related to quality of construction, shortage of water, inadequate mobilisation to generate demand for toilets and an apprehension that toilets will make their house dirty.

The reasons for not constructing toilets articulated by the community include:

- Sirata in Chhindwara has high density of houses. Around 70 toilets have been constructed and are being used by the families. However, a constant foul smell emanates from these toilets and while cleaning them the neighbours report that they have to move out of their house. This has been reported as a de-motivating factor for other households to go in for toilet construction in their respective houses. The remaining households prefer the inconvenience of open defecation near the road.
- There are enough open spaces in and around our village hence we do not need toilets in our houses (Dindori and Shajapur).
- It will lead to additional burden of bringing more water from the water source for the toilet (response of women especially at Samri, Shajapur; Sagore, Raisen; Bhainsrawan, Shivpuri and other villages)
- Additional burden on women for cleaning of toilets (This was borne out in households where toilets had been constructed that the responsibility for cleaning of toilets rests with the women).
- The subsidy provided is insufficient. Earlier higher subsidies were being given and now when we want toilet contribution is being asked for (Kharbai, Raisen).
- We will have toilet when we will be allotted funds under Indira Awas Yojana (10 villages).
- There is not enough space in the house to construct the toilet (7 villages).
- What will we do after the pit will be full (11 villages).
- Lack of knowledge about the scheme that supports construction of toilets (3 villages)
- The houses are located on rocky land and it is costly to dig a pit (Narwar, Raisen).
- It is the only opportunity for going out of the house and socialising with other women (*dolne jane ko milta hai, Ajnol, Bhind*; Shajapur and Rasien).
- Do not have resources to build the wall or cover the toilet properly (9 villages).

There were some groups and members of the household who articulated demand for toilets. The

reasons put forward by them for having toilets is as follows:

- It is convenient as it can be used at any time of the day in any season
- There is trouble in going out (*bahar jane mein jhanjhat hai*). The farmers do not allow to go into the fields (Sirata, Chhindwara) Do not allow to go into the forest (Kharbai, Raisen)
- Can be used at least by women and the old people in the house. The men can continue going out in the open.
- Pregnant women and persons who are ill can use the toilets

Conclusion

The community so far has been able to perceive the need for toilets from the point of view of convenience only. Toilets have not been related to the health aspect, as a mechanism that can prevent illnesses and diseases in the family and the community. The reasons for not constructing toilets relate to the physical factors (of shortage of water and lack of space); economic factors (un-affordability of pit-digging and ability to bear the cost of super structure); gender role division (increased work burden) and attitudinal (availability of open space, opportunity for socialising etc)

4.2 Sanitary Complex

Out of the 50 villages studied during the present exercise Women Sanitary Complex was found in only one village at Gudrawan in Shajapur.

Gudrawan has 65 private latrines made in the Patidar colony and another 24 in the Indira Awaas colony. Patidars dominate in numbers and in terms of economic power in the village. The private latrines made in the Indira Awaas colony are not being used. They are being used as additional room of the house for storing various items. The private latrines made by the Patidars are being used regularly.

The Patidar colony has a high density of houses. All the houses do not enough space to construct individual latrines. As a result a common toilet facility for the women of this colony was thought of. A three seater sanitary complex was built that is exclusively being used by women belonging to Patidar colony.

The facility of common toilet is being used by women of 10 households. These women find the facility useful as they can avail of this facility at any time of the day in all seasons. The water for the toilet is accessed by a common tap connection placed near the complex.

The common toilet is cleaned by a person engaged by the Gram Panchayat for the purpose. There are no charges levied on the users.

The idea and design of common sanitary complex seem to have relevance in settlements with high density of houses and where water is easily accessible. The example found at Gudrawan however subsidises better off households by providing public money and not putting up charges for the users.

4.3 Personal Hygiene

Discussion on personal hygiene included hygiene practices related to bathing, cleaning of teeth, cutting and cleaning of nails, and hand washing practices. During the field testing of the methodology and the checklist of questions it became clear to the study team that the adults and children give politically correct responses though the observed practices are contradictory to their responses. The community anticipating the questions also changes its behaviour (nails cleaned, hand washing demonstrated etc) on subsequent visits. Consequently it was decided that the study team would spend considerable time in observation of hygiene practices on its first visit to the village and this data will form the basic data on which the discussion would take place in smaller groups.

(a) Bathing

The data related to bathing amongst different community groups gives a confusing picture. For example, in villages where the water sources are at a distance and the people have to go to these water sources for bathing and washing clothes the frequency of bathing is once a week or even ten days during times of extreme water shortage. This would imply that it is the water shortage that is affecting the hygiene practices of the community. But at the same time within the same community group and in the same neighbourhood there are people who maintain better hygiene standards as they would take bath daily (almost) negating the generalisation that shortage of water is leading to poor hygiene standards. Consequently it is difficult to say that it is shortage of water that is the cause for poor hygiene practice in the community.

The discussions with the village community regarding bathing brought out the following points:

- Bathing practices in villages should not be compared to that of cities. In cities people bathe and then go to work. In villages people work and then take bath. So a visitor from the city will think that the people in the village are dirty whereas the fact is that they have not completed their daily work and hence have not taken bath for that day.
- Shortage of water and the trouble involved in accessing it determines the frequency with which bathing is practiced in the villages.

- In times of shortage of water it is frequency of bathing that is sacrificed first. This is more in case of children and the old persons as they cannot go up to the water source by themselves.
- Boils and skin diseases are common among children and adults as a result of infrequent bathing practice.
- The school teachers informed the study team that they teach the children to take bath and come to school. The teachers also report that they also understand the problem associated with taking bath daily as the parents too have to go to work to earn their livelihood (in case of labour) and hence do not emphasise this aspect too much. However, in some cases they have sent the child back home if he is found to be too dirty.

(b) Hand Washing Practice

The discussion on hand washing practice was always full of politically correct responses from the community in all the villages. The children, the adult men and women could recount correctly when hands should be washed – before and after meals, after toilet, before cutting vegetables etc. However even casual observation of the respondents in their home brought contradictions in their behaviour. For example, the women who had just stated that hands should be washed after cleaning the child who had just defecated was observed by the team to ‘clean’ her hand by soil without washing with water and saw her continue her work in the kitchen. Such observations made it clear that it is not the level of awareness that is the inhibiting factor in the community, but the inability to put in practice what they know is a good healthy practice.

The other aspects of hand washing behaviour that were assessed by the study team are as follows:

- **Beliefs and Notions:** Baigas do not use water for toilet hence they do not wash their hands. ‘If a Baiga uses water for toilet she/he will not remain a Baiga’. The other notion was in Bind where some groups reported that they do not use ash for washing of hand as it is believed that it is *bhabhoot of Lord Shiva*. Hence they use soil to wash their hands. According to women their work involves putting hands in water hence they are not required to wash their hands every time (*mahila ke kaam mein hamesha haath geelai hote hain isliye use haath dhone ki jaroorat nahin hai*)
- In most cases the children would respond that they use soap for cleaning their hands. But when asked to recall the brand of the soap they were unable to do so or would state the name of a soap that they have seen in an advertisement. This brand of soap was not stocked by the shop keeper in the village.
- The teachers in schools serving the mid day meal to students ensured by personally monitoring that

each child properly washed their hands. This was however dependent on the availability of water near school.

- In villages with acute water shortage like Sagore (Raisen) and Samri (Shajapur) the women reported that they keep water out of reach of children so that it is not spilled and wasted. In such cases hand washing is not frequently practiced behaviour either among adults or children.

(c) Dental Hygiene

Dental hygiene includes daily brushing of teeth. The study team found different standards of cleaning teeth within the same village and within the same caste economic groups. However, one factor that was common was that the condition of teeth in villages affected by fluoride the condition of teeth was quite poor. In fact at Umrikalan the teeth of all were yellow and it is getting difficult to find match for the girls in the village because of this.

The study found an entire range of material being used for brushing of teeth. This includes tooth paste (among younger generation), twigs (datoon) of neem, jamun, babool and tendu depending upon the availability of the tree in and around the village.

In the assessment of the study team school is playing an important role in developing better dental hygiene practices among children. The children identified school as the major source that provided information on dental hygiene.

Conclusion

Thus, in personal hygiene, the basic issue is not level of awareness, but actual behavioural practice of the community. Shortage of water does determine the degree of adherence to the hygiene schedule, especially bathing, but it is not the only factor. Other factors include the beliefs and notions of the communities, their level of motivation for self discipline and in case of dental hygiene, the quality of water.

4.4 Solid Waste Disposal

Solid waste includes the waste generated within the household. The disposal mechanism refers to the manner in which this waste is disposed off safely.

The traditional manner of waste disposal from the household was the responsibility of each house in the village. The household would earmark a particular site not too far away from the house and deposit all the waste at this site (referred to as ghoora in local language). This used to be an open site and would include disposal of faecal matter of the children and the old persons. The waste material would decompose being in open and receiving direct sunlight. After

regular intervals this matter was removed and disposed off by spread the decomposed matter in the agriculture fields. This system still continues till the present day but due to increase in population and the number of houses the number of ghooras in the village have increased. The regularity with which the decomposed matter used to dispose off is also not followed. As a result the villages have ghooras on the main road of the village and the refuse spreads all over the village whenever the wind blows. Since the ghoora of a particular household is not in front of their house they are not concerned about its disposal, though the same household would be at the receiving end of the refuse flowing into their house from some houses ghoora.

In the 50 villages surveyed the system of waste disposal was present in all the villages. Only in two of the villages NADEP pits were constructed and were being used by a small section of the households—Mendori and Mohad at Raisen. In households where the Gobar Gas plants were functioning the waste disposal was taking place by disposing the organic waste as raw material for the plant. This has made these houses cleaner within the neighbourhood. This was observed at individual household level at villages in Raisen, Chhindwara and Shajapur. At Mohad in Raisen the Gobar Gas plants have been installed in all the households (33 households). The village streets at Mohad are clean and the general cleanliness standard at Mohad was higher than in other villages (even in the same Gram Panchayat).

The community does agree that the system of ghooras makes the village dirty but there seems to be some sort of lethargy and an attitude of passivity about dealing with the problem. Confronted with the problem the tendency of the groups is to blame other groups in the village for the problem.

A common problem that came up during discussions on disposal of solid waste was related to disposal of plastic bags. Even in villages where the households were using NADEP pit for disposal the problem of disposal of plastic bags remains. The community was at odds to deal with the problem which according to them is increasing every day.

In addition to the solid waste disposal generated from the houses the study team also found the disposal mechanism practised by different trades carried out in the village. Food shops and tea stalls were throwing their waste near the shop in open. Barbers were found to be throwing the hair and other refuse in open or in the existing ghooras (see Box on Narwar)

Conclusion

With the growth in the population of the villages and increase in the density of houses the problem of

Narwar

There are three barber shops in the village. On contacting these shops the study team was informed that the hair and other refuse from the shops are properly being destroyed- burnt and buried. On inquiring further the team was informed that site for the disposal is outside the village.

Impressed the team had noted this information and believed it till it came upon a dry well near the village pond. On peeping inside the team found that the bottom of the well is full of hair and other garbage dumped by the villagers. In fact the well was being used by the village as a garbage dump. On confronting the barbers with this information each of the barber blamed the other for throwing hair in the well!

solid waste disposal has assumed significance. The traditional system of ghooras seemed to have outlived their utility. The community agrees that the village is getting dirtier but does not seem to possess either the attitude or the knowledge of setting up an effective disposal mechanism.

4.5 Liquid Waste Disposal

Liquid waste was defined in the study to comprise of waste water coming from the households and the disposal of rain water from the streets. The common method of disposal of this water is through a network of drainage in the village.

Four categories of villages emerged during the field study with facilities related to drainage system:

(a) *the entire village is covered by closed drainage- Mendori and Mohad in Raisen*

The main factor that led to the construction of closed drainage system at Mendori and Mohad was that the former was included under the sector reform programme and the latter village was provided funds under DPIP programme. Both the villages are small with number of households being 40 and 33 respectively. Moreover the location of the settlement is such that the waste water can flow towards one side and away from the village.

These two villages were clean and the system of closed drainage seems to be working well for the village. The community too is appreciative of the work and had observed that it has improved the status of the village in the neighbouring area.

(b) *the entire village (almost) is covered by open drainage-Dhaulagarh (Shivpuri), Gudrawan (Shajapur), Singodi and Sirata (Chhindwara) and Narwar (Raisen).*

The villages that are covered with open drainage have a high density of houses and have also been covered under the Piped Water Scheme also. The cleaning of drains however left much to be desired. Few houses in a colony would collect money and employ a person to clean the drains from their neighbourhood. As a result there are few clean drains in the village but by and large the drains are clogged with mud and waste material. This often results in the water flowing in the main street further generating mud and dirt all over.

No institutional responsibility for cleaning of drains has been fixed either on a person or on any village organisation. As a result cleanliness is dependent on community (or its group) perception of dirtiness that motivates them to take measures to clean them.

*(c) part(s) of the village covered with open drain
– (28 villages)*

A large number of villages fall in this category. In these villages a part or one colony has been covered with open drain. The opening from these drains is open and often either flows into another mohallah or drains out near the village. The net result is that most streets of the village are muddy and emanates foul smell. It is difficult to walk even during dry season (March/April when the study was done). The community plays a blame game without realising that it is the households on both sides – with drain and without drain – that are at the receiving end.

Generally the parts of the village that are covered with a drainage system belong to the upper castes and economically better off members of the village community. It is these households who have the need for paved streets so that their vehicles (motor cycles, tractor, and jeep) can ply easily. The drains are made on the sides of these paved streets. The waste water from the houses is linked to these drains and in the absence of proper and regular cleaning leads to accumulation of mud and muck either in the same street or at the point the drains opens out (which can be in a neighbouring mohallah).

*(d) no part of the village covered with drains (15
villages)*

These are villages where no part of the village is covered by any drainage system. These villages face a typical problem where water from the house is let out in the main street of the village causing pools of water and mud at all times of the year. There are some houses in some of these villages (few to be an insignificant number) that have dug soak pits and they drain their waste water from the house into these soak pits.

It is difficult to assess the community's position. At one level all the caste/economic groups are aware of the health implications of the collection of pool of water in the village. They also visualise that it is a problem that can be solved collectively. At another level they are not willing to take the initiative. They do not seem to be too concerned about the issue (sort of compromised with the situation and have learned to live with it). Thus it is not lack of awareness on part of the community that is not generating demand for drainage system in the village. The critical input going into villages where a network of drainage system was created was the presence of leadership from within (Mendori) or outside the community (Mohad). The leadership was informed and was able to motivate different groups to accept and work towards a drainage system in the community. The fact that resources were also made available in these villages also played an important part in the successful implementation.

Issues in Sanitation

Awareness vs Behaviour

The level of awareness on issues related to hygiene and sanitation in the community is not the inhibiting factor to institutionalise better practices amongst them. The critical factor is the behavioural aspect of better hygiene and sanitation practices. The community has come to accept and learned to live in conditions that fall short of standards of healthy environment. The need is to awaken them from their stupor and develop local leaders who can act as agents of change within the community. It requires an intensive and sustained effort at community mobilisation that cannot be achieved by IEC alone. The continued presence of animators is critical in generating motivation, providing movement and maintaining momentum to the entire effort.

Availability of Water and Sanitation

There is a critical link between availability of water and better sanitation practices. This is observed in case of use of toilets and in carrying out activities related to personal hygiene. Thus issues of sanitation should be linked to and addressed alongwith planning for water.

Holistic Approach

The approach to sanitation at the village level has been activity focused. That is, the sub-components of sanitation have been sought to be addressed in isolation – toilet construction, personal hygiene, solid waste disposal and liquid waste disposal. However at the community level all these components are important. Addressing any one of them does not effectively address the issue of sanitation. This has been best exemplified at Mendori where closed drainage for liquid waste disposal, NADEP pit for

solid waste disposal, toilets in each household, kitchen garden for trapping and using waste water, reliable piped water supply system for personal hygiene has effectively been implemented. It is the net result of implementation of all these factors that brings improvement in the quality of life of people. Implementing one of the components – over emphasis on toilets under TSC – is not likely to make difference in people's life unless other issues are also addressed.

Role of School

Schools have been identified as a major source of information related to matters of personal hygiene. This factor should be accounted for in the development of overall strategy for IEC and efforts at community mobilisation. It also implies that the role of other service delivery mechanism especially Anganwadi and health should also be reassessed to ascertain how they can also impact the awareness and behavioural levels of the community.

WATSAN in Institutions

Village institutions include places that deliver services in education, health and are used for community gatherings like Community Hall and Panchayat Bhawan. These places are used by a large number of persons for a defined period of time. The facilities for drinking water and the quality of sanitation are important factors that determine the level of client satisfaction and ensure repeated use of services by him/her. The present study assessed the state of facilities for water and sanitation in village institutions and the level of client satisfaction from these services.

5.1 Education

(a) Anganwadi

Anganwadi is the centre where children below six years of age assemble to receive services in supplementary nutrition, health check up and education through play way methods.

The number of Anganwadi centres that were running in the villages at the time of the field visit is given in Table 5.1.

In the six selected districts the study was conducted in 50 villages in which 29 villages had 37 Anganwadi centres running at the time of the survey. There were 2194 children enrolled in these Anganwadis. Among these centres 8 had their own building and the construction of building of 3 centres was in progress. The remaining 24 centres did not have their own building and the services were being delivered from a rented house (generally that of the Anganwadi worker).

Drinking Water: In none of the 37 Anganwadis was there a separate provision for drinking water, including the centres that had their own building. In general

the children were asked to drink water, or wash their hands/utensils from the nearest water source that was used by the Anganwadi worker for her own domestic purpose. In some cases where the worker had made provision for storing water in a steel drum or earthen pot the drum/pot was neither cleaned regularly nor was it kept in a clean/hygienic place.

Sanitation: The information related to facilities for sanitation is given in Table 5.2. This information pertains to Anganwadi centres that had their own building.

Among the 8 Anganwadi centres with their own buildings 4 had urinals and toilets constructed within the premises. However, during the field study only one (12 per cent) was found to be functional. The main reason for non-functionality of the constructed facility was because the pipe had broken (Didi, Bhind), the toilet is waiting inauguration by higher officials (Naharkheda, Shajapur) and the construction is not complete (Agarra, Shivpuri). In such cases the Anganwadi worker has locked the entry of the toilet/urinal so that it cannot be used at all.

It was only at one village (Barai, Shajapur) that the urinal/toilet was found to be functional. However the toilet demanded cleanliness and was not being used by the children.

Anganwadi centre is one of the places to imbibe healthy hygienic practices among children. The study team observed that in all the Anganwadis the nails of the children were dirty, they did not clean their teeth regularly not was bathing a daily phenomena. In some cases (Anganwadis in Bhind and Shivpuri) even the Anganwadi worker was observed to have poor personal cleanliness standard. The disposal of solid

Table 5.1 Number of Anganwadi in Villages Selected for the Study

District	No. of Study Villages	No. of Villages with Anganwadi	No. of Anganwadis	No. of Children Enrolled
Raisen	11	1	1	84
Shivpuri	9	5	6	420
Bhind	10	7	10	775
Shajapur	7	4	6	226
Chhindwara	6	6	6	273
Dindori	7	7	8	416
TOTAL	50	30	37	2194

Table 5.2 **Facilities for Urinals and Toilets in Anganwadi Centers with their Own Buildings**

District	AWC with own buildings	Urinals			Toilets		
		Constructed and Functional	Constructed and Non Functional	Not Constructed	Constructed and Functional	Constructed and Non Functional	Not Constructed
Raisen	0	0	0	0	0	0	0
Shivpuri	2	0	1	1	0	1	1
Bhind	2	0	0	2	0	1	1
Shajapur	2	1	1	0	1	1	0
Chhindwara	1	0	1	0	0	1	0
Dindori	1	0	0	1	0	0	1
TOTAL	8	1	3	4	1	4	3

waste and children's faces from the Anganwadi was to the nearest ghooora (an open refuse disposal).

(b) Schools

Schools include the primary schools (including Education Guarantee Scheme), middle schools and high schools run by government and private agencies. In the 50 villages studied there were schools in 40 villages. In all there were 84 different types of educational institutions (Table 5.3).

Drinking Water: Of the 84 schools, 31 schools (37 per cent) had their exclusive source of water, in which water from handpump was the major source and located within the premises of the school boundary. In certain cases the handpump from the school also provided water to the households (e.g. Dhaulagarh in Shivpuri or Sarsai in Bhind). In terms of regional distribution the schools in Chhindwara and Shajapur are poorly serviced as far as facility for providing water is concerned.

The discussion with children and teachers in schools with no exclusive source of water revealed that:

- Children go to their houses or to the nearest source of water during school hours to fulfill their

drinking water needs. In most cases this was stated to be an inconvenience and in some cases this was stated as the reason for the child not coming back to school.

- With the Mid Day Meal scheme being implemented at the primary level the issue of availability of drinking water source near the school has assumed importance – to make water available for cooking purposes, for washing hands and utensils and for drinking water during meals. The Parents Teachers Association is expected to undertake measures for this purpose but in most cases the Association is not aware of this role.
- The water storage in the school is in containers that are made of either metal or cement and, in some cases, in earthen pots. In case of cement containers these are seldom cleaned and were found to be dirty by the study team. Neither the children nor the teachers were using them for storing/drinking water. In Narawar (Raisen) the cement container in school is used for dumping refuse by the children and adults.

Sanitation: Sanitation in schools include facility within the school premises for urinals and toilet facilities as well as the general cleanliness of the rooms and

Table 5.3 **Number of Schools in Villages Selected for the Study**

District	No. of Study Villages	No. of Villages with Schools	No. of Schools	No. of Schools with Own Building
Raisen	11	6	10	9
Shivpuri	9	5	9	9
Bhind	10	9	28	17
Shajapur	7	7	13	13
Chhindwara	6	6	16	16
Dindori	7	7	8	8
TOTAL	50	40	84	72

Table 5.4 **Drinking Water Facility in Schools**

District	No. of Schools	Source of Drinking Water	
		Handpump	Well
Raisen	10	9	0
Shivpuri	9	2	1
Bhind	28	7	0
Shajapur	13	6	1
Chhindwara	16	1	0
Dindori	8	4	0
TOTAL	84	29	2

school surroundings. At another level, the inquiry into sanitation also included the awareness levels and the behavioural practices related to personal hygiene.

The information related to construction and functional use of urinals and toilets in schools in the selected villages is given in Table 5.5.

Thus, of the 72 schools with their own buildings the facility for urinal and toilet existed in only 29 and 14 per cent of such schools. Again of the existing facility only 70 per cent of the urinals and 40 per cent of the toilets were found to be functional.

The issues related to sanitation highlighted by children and the teachers during discussions and the observation of the research team is as follows:

- The main reason for non-functionality of toilets is the inability to fix the responsibility for cleaning. The teachers were categorical in their assertion that it is Parents Teachers Association's responsibility to ensure that the toilets are cleaned and they need to employ and pay a person to ensure this. Since the PTA or any other agency is able to ensure the cleaning of the toilet the teachers often lock the door so that nobody

uses the toilet and make it more unclean than it is at present.

- In schools with their own building the issue of the need for a toilet was discussed. The children, including girls, did not find it important that such a facility is important or required in their school. According to them they are used to going in the fields and it is not inconvenient for them to continue using the same.
- The level of awareness on hand washing practice, dental cleaning, cutting and cleaning of nails, bathing among the children was found to be high. The children provided all the correct answers related to hygiene practices in the schools across all the districts. However, a casual observation of their behaviour in following the practices was found to be lacking. On confronting, the children would sheepishly reply that they normally follow the advice but due to various reasons they have not been able to perform it on that particular day. [The team's observation was that in their visit to the village the next day the children would be clean and ensure that the team member notices it as well].

5.2 Health

The buildings for sub-centre existed in only 8 out of the 50 villages surveyed. These villages are in Raisen (Narwar), Shivpuri (Sakalpur, Bhainsrawan and Agarra), Bhind (Gata and Gaheli), Shajapur (Nazarkheda) and Chhindwara (Singodi and Sirata). The drinking water at these sub-centres is secured from the nearest water source and is available to the visitor in the earthen pot. Toilet facility has been provided for in only 3 sub-centres, namely, Bhainsrawan, Agarra and Singodi. The ANM reported that the facility is available for use for persons who visited the sub-centre. The study team observed that the toilets were clean and it seemed that they are generally being used by the ANM herself.

Table 5.5 **Facilities for Urinals and Toilets in Schools with their own Buildings**

District	Schools with own building	Urinals			Toilets		
		Constructed and Functional	Constructed and Non Functional	Not Constructed	Constructed and Functional	Constructed and Non Functional	Not Constructed
Raisen	9	4	4	1	3	5	1
Shivpuri	9	2	2	5	1	1	7
Bhind	17	1	0	16	1	0	16
Shajapur	13	4	0	9	0	0	13
Chhindwara	16	2	0	14	1	1	14
Dindori	8	2	0	6	0	1	7
TOTAL	72	15	6	51	6	8	58

5.3 Panchayat Bhawan and Community Hall

Panchayat Bhawan and Community Hall function as places where people from the village would normally congregate for holding meetings and/or for holding social events like marriages. Among the 50 villages surveyed, there are 20 such buildings in 16 villages in the six selected districts.

Of the 20 public buildings, toilets and urinals are constructed in only 8 buildings. None of the buildings in Shajapur, Bhind and Shivpuri had the facility of toilet within the building premises. Public buildings in Chhindwara, Raisen and Dindori had the provision of toilets.

Of the 8 buildings where toilets had been constructed, three of them were not being used. On inquiry it was found that one toilet at Pati is opened only when senior officers visit the village. At two other places the toilet is awaiting inauguration! (Babai and Barai).

5.4 PHE Department

The study team observed the facilities for drinking water and toilets in the PHE Department's office that it visited during the course of the study. The observations of the team are as follows:

- There is no provision for drinking water in these offices that can be used by the visitors. The visitor has to depend on the office peon to get water.
- The toilet facilities for the visitors are in poor condition at Raisen, Bhind and Chhindwara. The cleanliness of these toilets left much to be desired. At Shajapur, Dindori and Shivpuri the facilities were of an average level. With the exception of Shivpuri, no separate toilets have been made for women visitors.

Issues

Provisioning of Facilities

The poor coverage of Anganwadi and Schools for

Table 5.6 **Per cent Coverage of Schools and Anganwadi for Drinking Water and Toilet Facilities**

District	Anganwadi with Toilet	Schools with Drinking Water Facility	Schools with Toilets
Bhind	0	8	0
Shivpuri	0	3	0
Shajapur	44	63	0
Raisen	2	32	0
Chhindwara	58	21	46
Dindori	0	4	0

drinking water and toilet facilities point towards the lack of importance given to this aspect in the provisioning of water and sanitation in the state. This fact is further borne out by the district level figures of the selected districts given in Table 5.6.

The poor coverage of drinking water and sanitation in Anganwadis and Schools selects itself for bringing as a major focus area of the programme. The nature, content and issues within this focus area are given below:

- (a) Is there a Demand:** In discussions with children, parents and teachers there did not emerge a demand for provisioning of toilet facilities either in schools or Anganwadi centres. Neither was it reported that the children (including girls) are shying away from school because toilet facilities have not been provided in the building.

The present study takes the position that the Anganwadi centre and schools are expected to be model demonstrations to the children and adults in practising and maintaining reasonable levels of cleanliness and sanitation. These centres are expected to teach the children about healthy habits that include a major component in personal and community hygiene. To back these messages with demonstrations these institutions should maintain a reasonable level of cleanliness that was found to be missing during the study.

The case of PHE offices in the district deserves to be mentioned as it is this department that is responsible to carry out IEC activities in the district and has a large number of visitors from the village. The PHE office should locate different models of toilets within its premises and maintain a high standard of cleanliness so that rural visitors carry the message with them and strengthen the IEC messages. Unfortunately PHE offices at the district level have not realised that it is they who have to practice what they are preaching to the villagers for sanitation.

It also implies that the Civil Society Organisations and their employees/volunteers who are advocating for adoption of better sanitary practices will have to adopt and make these a habit among themselves. The community and especially the children learn more from observation than from merely preaching-teaching mode.

- (b) Responsibility for Construction and Maintenance:** At present, the responsibility for construction is that of Parents Teachers Association. The Association contributes 10 per cent of the amount and the remaining is provided by the

PHE Department under the Total Sanitation Campaign. The actual implementation is done by a person/agency appointed by the PTA (in some cases the team was told that the construction has been done by a contractor appointed by the PHE Department).

The issue of maintenance of toilets, once constructed, has not been given enough importance. It is proposed that when the members of the PTA are mobilised they first make provisions for water and for the person responsible for cleaning of toilets before they make contribution for the construction. This may require intensive effort for a longer time period, in training and handholding support to the members of the PTA as these members change every year.

Quality of Infrastructure

The general quality of building of the institution is important before undertaking construction of facilities for toilets and urinals. For example, in Bhand the quality of construction of schools in general is of poor quality. Going in for an additional construction of toilets is not a rational choice unless the quality of the building is improved in general. Since the two constructions fall into separate administrative domains – Directorate of Public Instructions (school building) and PHE Department (toilets) it is seldom that the two departments would converge and identify buildings of reasonable quality that should go in for construction of toilets.

Awareness vs. Behaviour

There is high level of awareness in the children regarding hand washing practices, dental hygiene, bathing, personal hygiene, water handling practice and community sanitation. They can even recall the benefits of toilet in houses and institutions. Yet the actual behavioural practice of children is in stark contrast to their level of awareness. This indicates towards refocusing the content of IEC activities that promote and motivate adoption of the knowledge into practice.

Challenge for IEC – Water Availability and Quality

The general availability of water in the village defines the content of what the teachers in school teach and monitor regarding hygiene and cleanliness among children. In villages where there is water shortage the teachers reported that they find it irrelevant to discuss about bathing daily and maintaining high standards of cleanliness when they are aware that there is general water shortage in the village. Similarly in villages that are affected by water quality the teachers were concerned as to how much should they emphasise on cleanliness when they are aware of the poor quality of water that is available to the community (e.g. Mohad, Raisen). This underlines the challenge for IEC activities for sanitation in the community. The messages cannot be generic without taking into account the contextual differences in availability and quality of water in different villages. Moreover, the IEC will not only have to adapt the content of the messages but will also have to focus more on how to maintain (the behaviour) reasonable standards of cleanliness.

Financing for Water and Sanitation

The study collected data from the PHE Department at the district level to assess the availability of financial resources in the district for water and sanitation and to assess the funding pattern. The PHE Department at Chhindwara was unable to provide this information and had written to the Chief Engineer at Jabalpur requesting permission to provide the required information and also the permission to spend resources in providing the data! Till the date of writing the report the district PHE office had not received this permission.

Information related to funds under Total Sanitation Campaign in all the districts and Swajaldhara in sector reform districts (Chhindwara and Raisen) was not available at the district level. The study team was informed that the department does not have financial information related to these programmes. The information related to these programmes has however been accessed from the website of the Department of Drinking Water Supply hosted by Government of India.

Ideally the unit of analysis of the financial information should be the block. However the financial information is not disaggregated at the sub-district level and secondly, the block and PHE sub-divisional boundaries are not coterminous. Hence the unit of analysis in the present context has been taken as the district.

6.1 Level of Funding

The funds allotted to the selected districts are given in Table 6.1. The funds received by PHE Department under different schemes have been aggregated at the district level to estimate the total funds available.

The total funds available in the district on water and sanitation is around 4-5 crores per year, except Raisen, a sector reform district, that has funding level of 22

crores of the available funds 30-34 per cent of funds are in the sanitation sector, except Raisen (22 per cent), and the remaining are available for water sector.

6.2 Water Sector

The funds within the water sector are available for: (a) making provisions for water supply; (b) maintenance of water supply structures; (c) making provisions for recharging; (d) addressing quality problems; and (e) rejuvenation of traditional structures. The allocation of funds among these works is given in Table 6.2.

- (a) **Water Supply:** Making provision for domestic water in rural habitations has the largest allocation of funds in the districts (71 per cent to 92 per cent). Within these works the funds are available either for handpump or for making provision of water through piped water supply (Table 6.3).

The figures given in Table 6.3 include money allotted under different schemes that have provision of water supply. These schemes include the money allocated for schools, problem villages and habitations with less than 250 population. The sources of funds under these schemes vary on the basis of eligibility of the district under the Special Component Plan and/or under the Tribal Sub-plan.

The figures in Table 6.3 make it evident that:

- The districts with higher average population per habitation (Shajapur and Shivpuri) have a higher proportion of allocation for piped water supply schemes. Raisen on account of being a sector reform district receives a higher proportion of allocation for piped water supply schemes.
- Given the trend that the source of water for the PWS is through extraction of groundwater (tubewell) the total investment in the districts for

Table: 6.1 Allotment in Districts Selected for the Study (Rs in Lakhs)

Sources of Funds	Bhind	Shajapur	Shivpuri	Raisen	Dindori
Budgetary Allocations@	320.04	388.98	307.09	155	331.72
Swajal Dhara#	-	-	-	1560.3	-
TSC*	138.43	203.52	160.18	498.52	156.49
Grand Total	458.47	592.50	467.27	2203.82	488.21

@ Funds available to the PHE Department through budgetary allocation for the year 2004-05 except Dindori where it is of the year 2003-04

* Figures are of Release of funds in these districts

Figure pertains to total funds available that includes community contribution and interests accrued

Table: 6.2 Allotment in Water Sector in the Districts Selected for the Study (Rs in Lakhs)

Works	Bhind	Shajapur	Shivpuri	Raisen	Dindori
Water Supply	261.42	298.76	217.35	1331.45	304.72
% to total	82	76	71	78	92
Maintenance	36.14	30.12	36.61	335.82	0
% to total	11	8	12	20	0
Recharging	10.98	30	6.4	48	2
% to total	3	8	2	2	1
Quality	11.5	30.1	33	0	25
% to total	4	8	11	0	7
Tr. Sources	0	0	13.73	0	0
% to total	0	0	4	0	0
Total	320.04	388.98	307.09	1715.27	331.72

* The amounts that appear as Community Contribution and Interests accrued have been bifurcated as funds for Maintenance under Swajaldhara and added in the funds available through budgetary allocation in Raisen district.

Table: 6.3 Allotment under Water Supply in the Districts Selected for the Study (Rs in Lakhs)

Head	Bhind	Shajapur	Shivpuri	Raisen	Dindori
Handpump	167.59	90.68	72.85	8.4	242.72
% to total	64	30	34	13	80
PWS	93.83	208.08	144.5	54.05	62
% to total	36	70	66	87	20
Total	261.42	298.76	217.35	62.45	304.72

* Since the bifurcations of funds under Swajaldhara in terms of how the provisioning of water supply will be implemented are not available the amount under Swajaldhara has not been taken into account for Raisen.

making provisions for water supply is focused entirely on ground water extraction

- Funds for provisioning of water through sub-surface water (wells), surface water and stored water bodies (ponds and lakes) are conspicuous by their absence

(b) Maintenance

Bhind, Shajapur and Dindori do not report receiving funds for the maintenance of PWS schemes in the district. Shivpuri and Raisen receive 26 and 22 per cent of the funds for maintenance allocated for piped

water supply schemes as is evident from Table 6.4.

It needs to be pointed out that the responsibility for maintenance of handpumps is that of the PHE Department, where as PWS are to be maintained by the community. The maintenance of handpumps includes technical repairs of the pump as well as the repair of the platform.

(c) Recharging

The money allocated under recharging is used for works that ensure recharging of ground water sources.

Table: 6.4 Allotment under Maintenance in the Districts Selected for the Study (Rs in Lakhs)

Head	Bhind	Shajapur	Shivpuri	Raisen	Dindori
Handpump	36.14	30.12	27.13	34.54	0
% to total	100	100	74	78	0
PWS	0	0	9.48	9.98	0
% to total	0	0	26	22	0
Total	36.14	30.12	36.61	44.52	0

This could include construction of dykes, stop dams, drilling of parallel holes near the tubewell and handpumps etc. The funds allocated under the head recharging (Table 6.2) do not bear any proportion to the funds allotted under the head making provisions for water supply.

(d) Quality

To address the issue of quality in terms of making provisions for alternative source of water supply and undertaking chemical testing of water are included under the head Quality. Again the amount allocated does not bear any proportion to the number of villages or sources affected by water quality as is evident from the following Table 6.5.

(e) Traditional Structures

Shivpuri district has received money for the protection and rejuvenation of traditional water structures that include wells and bawadis in the district. There is no allocation under this head in other districts.

6.3 Fund Utilisation in Water Sector

The study had collected data on the expenditure pattern in the selected districts. The pattern of fund utilisation in these districts is given in Table 6.6.

The districts have utilised two thirds of the funds allotted to them during 2004-05 by February. At the aggregate level this utilisation level seems creditable but in terms of individual works there are wide variations:

- Amount spent on provisioning of water supply ranges between 58 to 69 per cent
- Amount spent on maintenance is higher than the allocation for these works
- Fund utilisation under recharging and quality is extremely poor except at Dindori where the entire fund has been utilised. At Dindori the recharging works included recharging of handpumps, construction of check and stop dams and conversion of *jhiri* into a dug well.

Table 6.5 Villages Affected by Quality Problem and Allocation for Quality in the Districts Selected for the Study

District	No. of Villages affected by			Budget allocated to address quality (Rs in Lakhs)
	Fluoride	Salinity	Iron	
Bhind	0	120	0	11.5
Shajapur	282	2	3	30.1
Shivpuri	89	0	0	33
Raisen	51	32	95	0
Dindori	166	5	18	25

Recharging of Handpump in Dindori

Dindori district has prepared a project for recharging of ground water sources for an amount of Rs 303.85 lakhs. The amount received under recharging is spent according to the proposed plan. The major recharging works in the district include:

1. **For Gravel Packed HPs:** With HP as the centre point a trench 1 m wide and 1.5 m deep is dug along a radius of 2.5 m from the HP. Where patches of black soil prevail, the depth of the trench is increased to reach the sub-soil levels that permit percolation of water. The bottom layer of the trench is filled 40mm stones and the upper layer with 20 mm stones. The top is covered with coarse grained sand.
2. **For Telescopic HPs:** A trench of 3x3x3 m is dug and packed with bottom layer (1m) of 40 mm and the middle layer with 20 mm stones. The top of the trench is covered with coarse grained gravel. The trench is connected to the HP with a horizontal pipe.
3. **Check Dam:** Check Dams are constructed over *nallahs* to increase the recharging of wells and handpumps in the down stream area.

- Fund allotted under traditional structures to Shivpuri has not been spent at all

Note: Percentage has been calculated on the allotment received under respective heads.

The focus of the PHE Department in the districts is on provisioning of water supply and on maintenance of its structures. The expenditure on maintenance being higher than the allotment indicates serious problems related to the water supply structures that have been installed in the districts. The dis-aggregation of the amount spent on maintenance in terms of amount spent on functional repairs or for increasing the depth of the pipe on account of water source becoming dry etc are not available. Such dis-aggregation would have enabled identification of the major problem related to maintenance.

6.4 Sanitation Sector

The major source of funds under the sanitation sector is the amounts received under Total Sanitation Campaign in the districts. The details of funds available to the selected districts under Total Sanitation Campaign are given in Table 6.7.

Quality in Raisen

Raisen district has prepared a proposal to address the issue of water quality in the district. Raisen has villages that are affected by fluoride, salinity, iron and nitrate. So far the district has prepared proposals for fluoride and salinity affected villages to the tune of Rs 700 and Rs 300 lakhs respectively. Projects to address the issue of iron and hardness are under preparation

Table 6.6 Fund Utilisation in the Districts Selected for the Study (Rs in Lakhs)

Head	Bhind		Shajapur		Shivpuri		Raisen		Dindori	
	Exp.	%	Exp.	%	Exp.	%	Exp.	%	Exp.	%
Water Supply	151.73	58	179.78	60	149.34	69	33.12	53	192.49	63
Handpump	150.86	63	65.46	72	114.19	157	5.18	62	148.87	61
PWS	45.87	49	114.32	55	35.15	24	27.49	52	43.62	70
Maintenance	43.2	120	30.66	102	40.13	110	35.79	80	0	0
Handpump	43.2	120	30.66	102	30.15	111	30.81	89	0	0
PWS	0		0	0	9.98	105	4.98	50	0	0
Recharging	2.4	22	1.43	5	0	0	0.02	0	2.05	103
Quality	0	0	0	0	8.65	26	0	0	24.67	99
Tr Sources	0	0	0	0	0	0	0	0	0	0
Grand total	197.33	62	211.87	54	198.12	65	68.93	44	219.21	66

Table 6.7 Funds Released and Utilised in the Districts Selected for the Study (Rs in Lakhs)

District	Sanction Month	Reporting Month	Projects Outlay	Approved	Release of funds	Expenditure	% Exp. on Release
Chhindwara	Feb'03	Mar'05	1128.13	963.13	96.32	91.81	95
Shajapur	Jul'03	Apr'05	780.68	678.45	203.52	170.82	84
Shivpuri	Jul'03	Apr'05	601.98	533.99	160.18	173.34	108
Bhind	Jul'03	Nov'03	648.11	568.83	138.43	0	0
Raisen	Aug'00	Jun'04	1086.33	944.31	498.52	319.54	64
Dindori	Jul'03	Aug'04	726.9	636.38	156.49	67.09	43

The table makes it evident that:

- TSC had been sanctioned in 2003 in all the districts with Raisen piloting the project in 2000.
- 85 to 87 per cent of the project outlay has been approved for the selected districts
- Of the approved outlay 24 to 29 per cent of the funds have been released for Shajapur, Shivpuri, Bhind and Dindori. Raisen has been released 52 per cent of the funds whereas Chhindwara has been released only 10 per cent of the funds approved
- In terms of per cent expenditure on the amounts released there is variation between the districts. Shivpuri has spent more than the money released under TSC whereas Dindori has reported less than 50 per cent of the funds released to the district. Bhind has not reported any expenditure under TSC so far.

Issues in Financing

Presentation of Financial Information

The financial information of the department is presented in terms of demand number and then

scheme wise. In the absence of the explanation of the demand numbers and the codes of the schemes this information is not amenable for use by any person other than the accountant.

Consolidation of finances in terms of works to be performed by the department are not disclosed at any level. This restricts the civil society participation in the assessment of the departments work and their efficiency. There is need for an agency to translate the budgetary information of the department into a more usable and hence relevant information.

Sharing of Financial Information

The disclosure of or access to financial information of the department does not form part of the Citizen's Charter or the Right to Information. This restricts availability of this critical information to the larger civil society. The case in point is Chhindwara where the district office was not even willing to share the financial information even for research purposes. As a diversionary tactic they referred the request of the researchers to the Chief Engineer as the head of the PHE Division in the region.

Approved allotments and expenditure of the government are part of the public expenditure as they get funded from public money. The expenditure does get commented upon by the auditors which relate largely to the adherence to the procedures and financial propriety. The civil society has an equal right to seek financial information and analyse it in terms of its social relevance.

Relationship between Physical and Financial Works

The financial information is not related to the physical works performed by the department. In the current form the information related to physical and financial works is for different time periods and thus are not comparable. Secondly, the information on physical works is not compiled or presented in terms of different schemes. For example, the financial information related to Prime Minister Gramoday Yojana is available from the financial statements but the physical works do not report the number of handpumps installed under this particular scheme. This information is available within the department but is not normally part of the information that is available for public domain.

Community Contribution and Financing

The present programmes of Swajaldhara and TSC involve community contribution either in terms of cash or labour. Though the money by way of contribution is not received by the department, the sanctioning and completion of the schemes is based on whether this contribution has been provided. The amount of resource available in the district should therefore be compiled and this contribution mentioned as part of the financial resources for water and sanitation in the district. The end of the year assessment can then be

undertaken whether the community did provide the resources it had promised.

Information on Incomplete Works and Projects

The observation in villages selected for the study point towards the issue of incomplete works. At Mohad (Raisen) a piped water scheme was approved and went into implementation under the sector reform programme. The water for the scheme was to be drawn from a well. Unfortunately the well was dug (as part of the scheme) but did not provide sufficient water. The scheme maintains its status quo in the village (virtual abandonment) and is not reflected either in the physical or financial information at the district level. In the financial information the scheme will appear as having been completed since the money has been utilised. Such instances need to be captured in the district data to make an assessment of the efficacy of the proposed schemes.

Integrated Financing

Proposed water structures need to be planned in an integrated manner so that their costing in terms of recharging and maintenance can also be budgeted. At the present moment the maintenance money is charged at the rate of Rs 500 per handpump. The cost of maintenance should however be a function of the age of the handpump. This will enable a closer monitoring of the handpumps and will also ensure improved survey in installation of new handpumps. Similarly, the budget for recharging works should also be built in for each water source so that its utilisation can be questioned and thereby ensured. This, however, will necessitate integrated planning of all water sources that will lead to integrated financing for each water source.

Recommendations

The primary user of this study is WaterAid India. It intends to use this study to develop its programmes for intervention in Madhya Pradesh. The issues that emerged from the field level study have already been discussed under respective sections. This chapter seeks to recommend the approach and programming frameworks for the state.

7.1 Approach to Programming

The study proposes the Human Rights Development perspective as the underlying approach to programming in the state. The main reasons for this proposition are as follows.

1. The state of social and economic inequity prevailing in the rural areas is creating differentiation in access, availability and affordability of services related to water and sanitation. The delivery machinery does not seem to be equipped to handle these inequities.
2. The emerging (and alarming) trend of deteriorating water quality and its impact on health and well being of the community will attract immediate and effective action when viewed from the perspective of rights.
3. Such an approach will create challenges and opportunities to develop entitlements related to sanitation that has been missing from the discourse so far.
4. The rights approach will bring the issues of the poor, their degree of participation and empowerment to centrestage of the process.
5. The rights perspective is directly linked to issues of governance and hence such an approach will develop a sharper focus on entitlements and the quality and efficiency of the delivery mechanism.

7.2 Programming Interventions

7.2.1 Demonstrative Models

The need for integration and for holistic planning has repeatedly emerged in the discussion of the data collected from the villages. The term 'integration' refers to sub-sectoral integration (water and sanitation) and the term 'holistic' refers to planning in entirety (planning for water source, water use, supply mechanism etc. given the competition between alternative uses of water).

The historical trends at the village level underline the eroding perenniality of water sources, raising serious doubts about the sustainability of existing water sources. The community hitherto accustomed

to resource availability, is now faced with a shortage of resources. Its use patterns and culture of resource-sharing are coming under stress, which has the potential of socio-political conflict. Symptomatic treatment of the problem, by exploiting more to satisfy more, is not sustainable and cannot last beyond the short term. The need for preparation of negotiated (between stakeholders) plans between competitive uses of water would be able to effectively address the core issue of making water sources sustainable (perennial) and water use pattern.

Such a plan should address at least the following concerns in water and sanitation.

1. Water Stress: Issues related to availability of water and source sustainability.
2. Water Security: Issues related to accessibility of water.
3. Water Quality: Safety standards in the consumption of water for domestic purposes.
4. Water Distribution: Issues related to delivery of and equity in benefit from distribution mechanisms of water supply on the principles of ability to pay and pay-as-you-use.
5. Water and Sanitation: Availability of water for healthy hygiene and sanitation practices.
6. Sanitation: A comprehensive plan that integrates hygiene, solid waste disposal and liquid waste disposal mechanisms at the household and community level.

The programme, for demonstrative model should not restrict itself only to the preparation of the plan but should implement the plan as well. Such demonstrations will serve as the learning hub on issues related to water and sanitation in the state for the government as well as civil society actors. During the present study, only one village – Mendori in Raisen – could be identified where the services in water and sanitation were integrated. However, this did not happen by design. It was the ambition of the Sarpanch to gain recognition wherein he pooled his political and administrative resources to gain the maximum benefit for the village.

7.2.2 Programming for Information, Education and Communication

Components of Information, Education and Communication (IEC) are either not given enough emphasis by the government or they tend to have messages that are generic, and expected to fit all situations and contexts. The current study has repeatedly pointed out that it is not the level of awareness that is the inhibiting factor but the

behavioural aspect that needs to be addressed. This would require preparation of context-specific and situation-specific IEC campaigns and modules that work as functional models that can be used by field functionaries. Such an IEC programme should also focus on developing institutions that are 'nearer' to the community or its groups like schools, Anganwadi centres, health workers etc. Programming could be taken up that develops mechanisms and processes to make the IEC material relevant and effective.

7.2.3 Advocacy

The advocacy framework for water and sanitation

should be focussed primarily on the issue of good governance. Policy statements related to water entitlements need to be reinterpreted and refocussed based on the perspective and needs of the community and its sub-groups – the poor and the socially and economically marginalised.

The advocacy effort should make the political representatives equally responsible and accountable for the state and situation of water and sanitation as it would hold the delivery mechanism of the government department responsible for the efficiency and effectiveness in implementation.

Annexure

Schedule 1 Village Level Schedule

1. Identification

- 1.1 Name of Village
- 1.2 Name of Gram Panchayat
- 1.3 Name of Janpad Panchayat

2. Information related to Gram Panchayat

- 2.1 Year of Formation of Panchayat
- 2.2 Number of Panch
- 2.3 Name of Panchayat headquarter
- 2.4 Number of villages in Gram Panchayat
- 2.5 Name of Sarpanch
- 2.6 Name of Panchayat Secretary
- 2.7 Name of Patel (if any)
- 2.8 Name of Janpad/Zila Member if resides in the village

3. Population

- 3.1 Total Population
- 3.2 Males
- 3.3 Females
- 3.4 Children (0-6 years)
- 3.5 Children (6-12 years)
- 3.6 Per cent literate

4. Social and Economic Groups in the Village

- 4.1 Name of castes groups that reside in the village
- 4.2 Names of some persons belonging to Poor, Middle and High income groups
- 4.3 Names of persons who can tell about the history of the village
- 4.4 Names of persons with disability in the village

5. Anganwadi Centre

- 5.1 Number of Anganwadi centres in the village
- 5.2 Number of Anganwadi Workers and Sahayikas
- 5.3 Number of children enrolled (boys and girls)
- 5.4 Children suffering from malnutrition
- 5.5 Does the Anganwadi centres has its own building
- 5.6 Does the Anganwai centres has a urinal and toilet
- 5.7 Is the urinal and toilet being used
- 5.8 If the urnal/toilet is not being used what are the reasons for the same

6. School

6.1 Information Related to Children and Teachers

Type of school	Number of Schools	Number of Children		Number of Teachers	
		Boys	Girls	Males	Females
EGS					
Primary					
Middle					
Secondary					

6.2 Facilities Available in School

Type of school	Source of Drinking Water	Urinal		Toilet	
		Yes/No	Is it being used, if not then reasons	Yes/No	Is it being used, if not then reasons
EGS					
Primary					
Middle					
Secondary					

Note: Mention if the facility has been for girls separately.

7. Health Facilities

- 7.1 Does the village has sub-centre
- 7.2 If yes, then number of health workers
- 7.3 Does the sub-centre has its own building
- 7.4 What is the system for water for the sub centre
- 7.5 Does the building have urinal/toilet
- 7.6 Is the toilet/urinal being used
- 7.7 List of illnesses that have been reported in the past two years
- 7.8 Name of ANM responsible for the village
- 7.9 Headquarter of the ANM and frequency of her visit
- 7.10 Does the village have a trained Jan Swasthya Rakshak
- 7.11 Name of MPW designated for the village
- 7.12 Headquarter of the MPW and frequency of his visit
- 7.13 Name of the hospital nearest to the village and the distance to this hospital

8 Other Facilities

- 8.1 Distance from the main road
- 8.2 Facility of bus service
- 8.3 Is the village connected by electricity
- 8.4 Does the village have post Office
- 8.5 Telephone connections in the village
- 8.6 Does the village fall within the mobile range

9. Sources of Livelihoods

9.1 Agriculture

- (a) Number of persons practicing agriculture in their own fields
- (b) Number of persons who are mostly engaged as labourers
- (c) Main crop (Kharif)
- (d) Main crop (Rabi)

9.2 Animal Husbandry

- (a) Number of households practicing dairying
- (b) Number of households practicing poultry
- (c) Number of households involved in fisheries

9.3 Households Industry and Trade

- (a) Number of households carrying on households industries
- (b) Number of households carrying out trade related activities
- (c) Number of households engaged in providing services

10. Environment Resources

10.1 Forest

- (a) Distance

- (b) Main Non-Timber forest produce
- (c) State of forest
- (d) Type of soil

10.2 Energy

- (a) Connected with electricity
- (b) Number of connections
- (c) Distance from which diesel and petrol are available
- (d) Prevalence of Gobar Gas plants in the village

11. Market Facilities

- 11.1 Place where haat-bazaar is routinely conducted
- 11.2 Place of local fairs

12. Community Institutions

Name of the Institution	Name of the President	Name of the Institution	Name of the President
Parents Teachers Association		Self Help Group	
Padhna Badhna Sangh		Bhajan Mandli	
Health Committee		Youth Group	
Forest Committee		Village Protection Committee	
Any Other		Any Other	

13. Other Social Aspects of the Village

- 13.1 Places at which people normally gather in the village
- 13.2 Different political groups in the village and their leaders
- 13.3 Different social groups in the village and the name of their leaders

14. Buildings for Public Purposes

- 14.1 Does the village have a Panchayat Bhawan
- 14.2 Does the Panchayat Bhawan have the facility for urinal/toilet
- 14.3 Is the toilet/urinal being used and the reasons if it is not being used
- 14.4 Does the village have a Community Bhawan
- 14.5 Does the Community Bhawan have the facility for urinal/toilet
- 14.6 Is the urinal/toilet being used and the reasons if it is not being used
- 14.7 Does the village have a Fair Price Shop

Schedule 2 Water Related Information

1. Take a **Transect Walk** of the village before mapping. Do a social and a water resource map of the village and discuss with the group on the following issues.

2. Rainfall

- 2.1 How much rain has taken place last year
- 2.2 Number of days it rained last year

- 2.3 Are the rains increasing/decreasing over a period of time
- 2.4 What are the reasons for increase/decrease in rainfall

3. Sources of Water

- 3.1 Surface water sources
- 3.2 Ground water sources

Note: Check whether all these sources are depicted in the social and resource map

4. Availability of Water

Source	State		Distance	Seasonal Availability of Water	Use of Water
	Past	Present			

5. Accessibility

Source	Shape of the Water Source	Who takes Water from the Source	Problems Faced in Procuring Water	Responsibility of Maintenance of the Water Source

6. Information related to Dry Sources

- 6.1 Name of source
- 6.2 Location of source
- 6.3 Reason for drying up of source
- 6.4 Who was most affected with drying up of source
- 6.5 Who took initiative to repair the source

Schedule 3 Check List of Questions for Households and during Focus Groups Discussion to assess Demand for Water

1. Assess Demand for Water on the following

Individual (a) Bathing (b) Hand washing (c) Brushing teeth (d) Toilet (e) Shaving (f) Washing clothes (g) Drinking	
Household (a) Cleaning of house (b) Lipai/putai (c) Washing of utensils (d) Cooler (e) Gobar Gas (f) Cooking (g) Watering plants (h) Washing of vehicle if any (i) Vegetable cultivation near the house	
For Animals (a) Drinking (b) Washing of the animal (c) Washing of the place where the animal is kept	
Industry (a) For making of terracotta utensils and tiles (b) Iron smith (c) Leather work (d) Bamboo/paper pulp (e) Hotel, tea stall (f) Making liquor (g) Colouring of clothes (h) Ironing of clothes (i) Fisheries	
Agriculture (a) Irrigated area (b) Un-irrigated area	
Special Events (a) Holi (b) Weddings (c) Fairs	
Construction	
Beliefs Related to Water	
Specific Problems Related to Water (a) Pregnant women (b) Manner of storage of water in the house	

Schedule 4 Hygiene and Sanitation

1. Cleanliness

- 1.1 What do you understand by cleanliness and what measures do you undertake for it
- 1.2 Specifically ask for children, males and females
- 1.3 What happens if there is no personal hygiene
- 1.4 Impact of unhygienic living on health and society
- 1.5 Why is hand washing important
- 1.6 When is hand washing required
- 1.7 What should be used for hand washing
- 1.8 Why should we cut our finger nails
- 1.9 If we do not cut our finger nails what will happen
- 1.10 Why is daily bathing important
- 1.11 Should we clean out teeth daily? How many times in a day?
- 1.12 What do you use for cleaning your teeth

2. Toilet related

- 2.1 Where do you go to defecate
- 2.2 Ask separately for children (0-5 years), children (6-14 years), males, females
- 2.3 If there is toilet in the house then ask
 - 2.3.1 What are benefits of having a private toilet
 - 2.3.2 Who uses the toilet (Children, male, female)
 - 2.3.3 Who has the responsibility to clean the toilet
- 2.4 Reasons for not constructing a toilet
- 2.5 Where do persons with disability go for defecation

3. Does everybody have the permission to wear chappals in the village?

4. Water related

- 4.1 How do you draw water
- 4.2 Cleanliness around source of water
- 4.3 Where do you clean your utensils
- 4.4 Where do you wash your clothes
- 4.5 Do people bathe near the water source
- 4.6 Do animals drink water near the water source
- 4.7 Does waste water get collected near the water source
- 4.8 State of cleanliness near the water source

5. Sanitation

- 5.1 How will you define a clean house
- 5.2 Manner of disposal of liquid waste from the house

- 5.3 Where do you dispose off the solid waste of the house
- 5.4 Who does the cleaning of the house – rooms and the place for keeping animals
- 5.5 Place where animals are kept – distance from house, system for ensuring cleanliness, washing of animals

6. Community toilets

- 6.1 Are there community toilets in the village
- 6.2 Who are the users of these toilets
- 6.3 Do the users have to pay for use of toilets
- 6.4 Who has the responsibility for cleaning these toilets

7. Does the Village have storm water drains? Are these drains cleaned. Who has the responsibility for their cleanliness and does the community have to pay for it?

8. Cleanliness of houses which have Gobar Gas

9. Does the village have NADEP pits? How are these pits used?

Does having a NADEP pit have an impact on the cleanliness of the house

10. Identify such **trades** that lead to unhygienic conditions in the village

11. The **level of cleanliness** in different colonies in the village

12. Where do the hotels, tea stalls and other **shop keepers** throw the garbage generated from their shops

13. Describe the cleanliness status of

- (a) Schools
- (b) Anganwadi
- (c) Health centre
- (d) Community hall

14. Identify the incidence of cases of illness due to unhygienic conditions

- (a) Malaria
- (b) Plague
- (c) Cholera
- (d) Jaundice
- (e) Polio
- (f) TB

Schedule 5 Role of Institutions

1. Who has the responsibility for getting a handpump installed in the village?

2. Who do you go to whenever there is shortage of water?

3. Who do you complaint to in the following cases?

- (a) Mechanical fault in the handpump
- (b) Handpump becoming dry
- (c) Complaint related to quality of water
- (d) Breakage in the platform of the handpump
- (e) Unsanitary conditions near the handpump

4. Who has the responsibility of cleanliness in the village?

5. If an NGO is working in the village:

- (a) What works have been undertaken by the NGO
- (b) Role of NGO in making water available to the community
- (c) Role of NGO in improving the cleanliness of the village
- (d) Role of NGO in water conservation
- (e) Role of NGO in health
- (f) What are your expectations from the NGO
- (g) What is your level of satisfaction from NGO's work
- (h) Have the facilities/services improved after the NGO started its interventions

6. Has any institution been formed for the maintenance of Water Sources?

If yes,

- (a) Post holders
- (b) Objectives of the committee
- (c) Activities of the committee
- (d) What is your level of satisfaction with the committee
- (e) Have the facilities increased

7. How do you participate in the activities of the NGO/Committee?

8. Decision-making in the village

- (a) Generally whose opinion is given more weightage in decision-making in the village
- (b) Who are the people who are actively consulted
- (c) Do women participate in decision-making
- (d) Do the members of dalit community participate in decision-making
- (e) Do persons with disability participate in decision-making

9. Who are the people within the village who do not have information related to hygiene and sanitation?

10. What are the sources from which you receive message related to hygiene and sanitation?

- (a) Do you find these messages relevant
- (b) How often do these messages reach you
- (c) What are your suggestions regarding the message or the medium of communication



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WaterAid – Water for All

WaterAid is an International NGO, established in 1981, in response to the United Nations declaration of the Water and Sanitation Decade, 1980–90, to enable better access of poor communities to adequate, safe water. WaterAid remains the UK's only major charity dedicated exclusively to the provision of safe domestic water, sanitation and hygiene education to the world's poorest people. WaterAid works in 15 countries across Asia and Africa, through local organisations and communities, helping them set up low cost, sustainable projects using appropriate technology that can be managed by the community itself. WaterAid also seeks to influence the water and sanitation policies of other key organisations, such as governments, to secure and protect the right of poor people to safe, affordable water and sanitation services.

WaterAid in India

WaterAid began working in India in the latter part of the 1980s with a few small projects and has since grown in strength and coverage. Today, WaterAid works in more than 10 states with three regional offices in Bhopal, Bhubaneswar and Bangalore, in partnership with local NGOs and government departments and ministries that seek assistance in the specific areas of rural and urban water supply, sanitation and hygiene promotion. Community sustained improvement in drinking water and sanitation has been WaterAid's watchword in all its programmes.

Different models of community participation and management, of both rural and urban water supply and sanitation, alternate delivery mechanisms, school hygiene promotion programmes, water conservation and recharge measures have been demonstrated to the sector. These projects have a strong partnering component with state governments and departments and have proved to be the inspiration behind successful replications in other states. A vast array of publications, including training manuals for development workers, issue sheets and concept papers for advocacy initiatives and IEC material have been jointly developed with NGO partners and are in wide circulation.

WaterAid has participated in collaborative initiatives with the government and other agencies including the Water Supply and Sanitation Collaborative Council (WSSCC), the Water and Sanitation Programme (WSP) of the World Bank, UNICEF and DFID. Alliances are important for core programming concerns of rural and urban programming for water and sanitation, Integrated Water Resources Management and Networking with a range of government departments and government organisations, at the national and regional levels in India. WaterAid India is committed to making its own contribution to the MDG challenge and is open to exploring ways of partnering with all stakeholders for achieving water and sanitation for all.

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