COMMUNITY MANAGEMENT OF RURAL WATER SUPPLY

Community Water *plus*

Xavier Institute of Social Service, Ranchi, India

Understanding resource implications of the "plus" in community management of rural water supply systems in India: DWSD, Jharkhand

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Community Water *plus* is a 20 case study research project managed by Cranfield University, UK, on behalf of the Department of Foreign Affairs and Trade (DFAT) of the Australian Government

Executive summary

This case study investigates the support given by the Drinking Water and Sanitation Department (DWSD), Government of Jharkhand, to community service providers for rural water supply and assesses the level of service achieved through this arrangement. A majority of consumers in the 'best practice' villages were found to receive acceptable service levels, which confirms the effectiveness of service provision. However, only 15% to 42% of households are connected to the piped water scheme, whilst the rest rely on other sources. In best practice villages, 33% of users access quantities classified as inacceptable and 37% receive water for less than one hour a day, which shows that major challenges remain.

The study found functioning Village Water and Sanitation Committees (VWSC) that manage water supply in all villages. The community is involved in decision-making through village meetings. The type of service provision was classified as community management with direct support, bordering on direct public provisioning, especially because of the heavy financial subsidy for operational expenses. The VWSCs have effective mechanisms for accounting and managing cash, whilst improvements could be made in the area of water security planning. Each VWSC has a 'Jal Sahiya' (water volunteer), selected from the daughters-in-law of the village, who acts as a treasurer and is responsible for water quality testing.

DWSD is responsible for implementing rural water supply schemes and supporting service providers. The department scored highly on its technical performance and interaction with external institutions. Support is given by training committee members and through technical and financial assistance for operation and maintenance. Systematic retraining new committee members would ensure that capacity is not lost when Jal Sahiyas change. In the studied villages, the department often pays for spares and some minor repairs are done by department staff, however, according to DWSD guidelines the VWSC is responsible for all operation and maintenance, which shows the somewhat unclear support arrangement. The department provides a matching grant to the audited records of user tariff collection, which incentivises VWSC to collect them. Furthermore, the electricity bills are paid by the department, which represents a major subsidy.

Jharkhand Summary Cost Table - calculated as the average cost per person, that is averaging across the three 'successful' villages

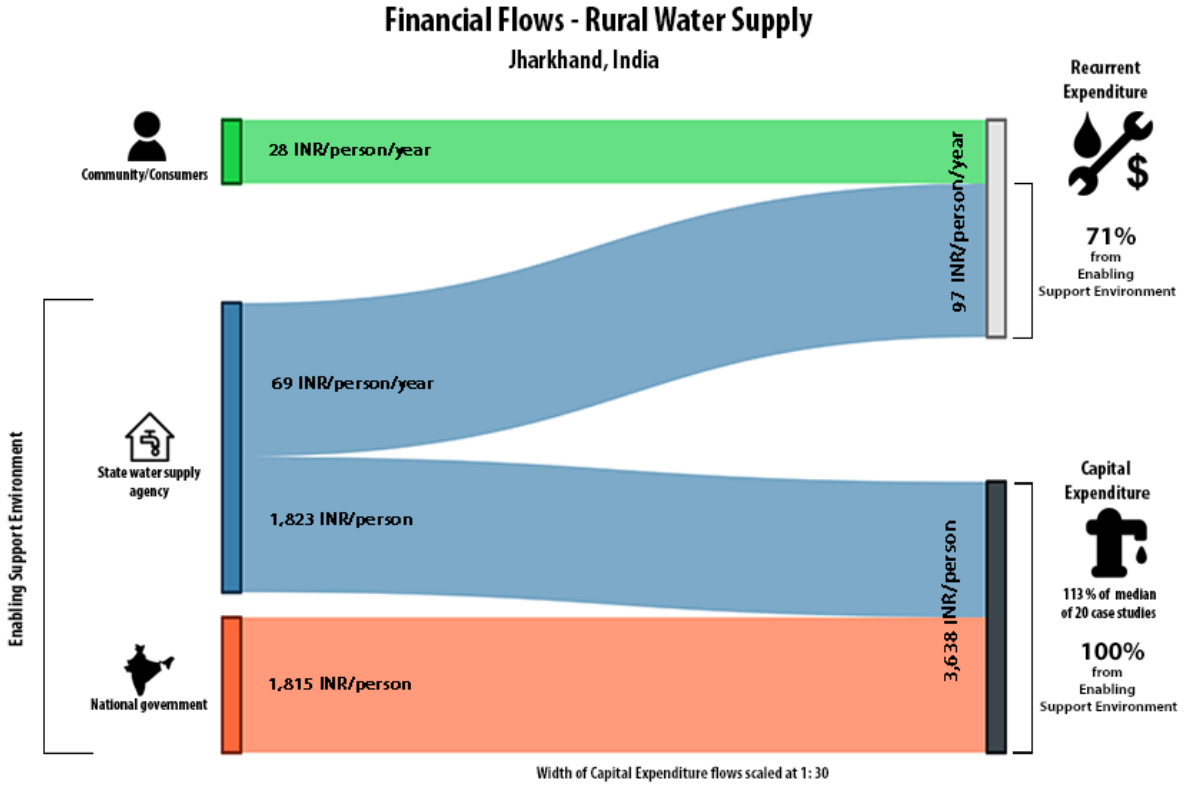
Source of funds	Use of funds - implementation			Use of funds - annual recurrent					
	CapEx hardware	CapEx software	CAPEX TOTAL	OpEx labour & materials	OpEx power	OpEx bulk water	OpEx enabling support	CapManEx	RECURRENT EXPENDITURE TOTAL
Community/consumers	-	-	-	INR 21	-	-	-	INR 7	INR 28
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	INR 1,815	INR 8	INR 1,823	INR 33	INR 35	-	INR 1	-	INR 69
National Government	INR 1,815	-	INR 1,815	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	-	-	-	-	-	-	-	-	-
TOTALS	INR 3,629	INR 8	INR 3,638	INR 55	INR 35	-	INR 1	INR 7	INR 97
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	100%	100%	100%	61%	100%	-	100%	0%	71%
Median of 20 case studies			95%						57%

Notes: CapManEx is only for the village Bero, as no data could be obtained for the other best practice villages

Total recurrent support costs were found to be INR 69 per person and year. Of this, INR 35 represent the electricity support for operation and maintenance and INR 33 for general operations support.

Costs for initial training and capacity building were estimated at INR 8 per person, which is less than 1% of the costs for initial construction of infrastructure. The service providers pay their staff salaries from tariff collection, which represents about 29% of operating expenses.

The Financial Flow Diagram, below, has been developed as an advocacy and communication tool. It aims to assist policy-makers and programme developers to visualise the 'plus' resource implications necessary for sustainable community-managed rural water supply services.



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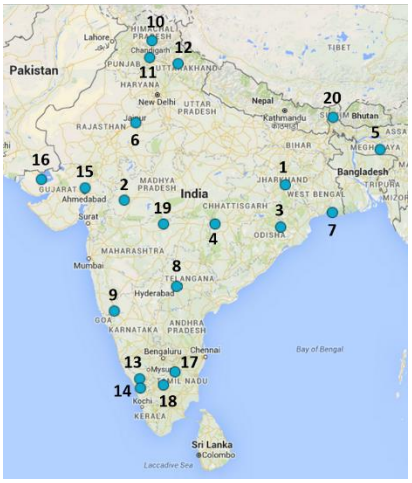
This research project has investigated twenty reportedly successful community-managed rural water supply programmes and approaches across India, from which we have subsequently developed understanding on the support needed to make community-management service provision successful and sustainable. The project has been implemented by a consortium of partners, including: the Administrative Staff College of India (ASCI), the Centre of Excellence for Change (CEC), Malaviya National Institute of Technology (MNIT), the Xavier Institute of Social Service (XISS) and IRC, The Netherlands with overall project coordination provided by Cranfield University, UK.

The research has been funded by the Australian Government through the Australian Development Awards Research Scheme, Australian Aid, Department of Foreign Affairs and Trade, under an award titled 'Community Management of Rural Water Supply Systems in India'. The views expressed in this report are those of the project and not necessarily those of the Australian Government. The Australian Government accepts no responsibility for any loss, damage or injury, resulting from reliance on any of the information or views contained in this report.



The twenty case studies

1	Jharkhand	**11**	Punjab
2	Madhya Pradesh	**12**	Uttarakhand
3	Odisha	**13**	Kerala (Kodur)
4	Chhattisgarh	**14**	Kerala (Nenmeni)
5	Meghalaya	**15**	Gujarat (Ghandinagar)
6	Rajasthan	**16**	Gujarat (Kutch)
7	West Bengal	**17**	Tamil Nadu (Morappur)
8	Telangana	**18**	Tamil Nadu (Kathirampatti)
9	Karnataka	**19**	Maharashtra
10	Himachal Pradesh	**20**	Sikkim

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The twenty Community Water *plus* case studies are available also in four page summaries, both in Indian Rupees and in US Dollar (PPP) versions, accessible from the project website. A Policy Brief and a Research Brief There is also a synthesis report available, published by Earthscan, London.

1 Introduction

This report is part of the Community Water plus series of case studies on community-managed rural water supply in India. It documents the support provided by the Drinking Water and Sanitation Department, (DWSD), Government of Jharkhand to the Village Water and Sanitation Committees (VWSC) in managing their pipe water supply system for providing drinking water to the villagers of Ranchi district. This report describes this support arrangement in detail, and assesses the effects of the support in terms of service delivery. It also provides an approximation of the costs involved in support.

Community management has long been recognised to be critical for rural water supply services. Indeed, community management has contributed significantly to improvements in rural water supplies. However those supplies are only sustainable when communities receive appropriate levels of support from government and other entities in their service delivery tasks. This may consist of easy access to call-down maintenance staff from government entities, or support from civil society organisations to renew their management structures and they may need to professionalize - that is, outsourcing of certain tasks to specialised individuals or enterprises.

In spite of the existence of success stories in community management, mechanisms for support and professionalization are often not institutionalised in policies and strategies. Success stories then remain pockets of achievement. Also, the necessary support comes at a price, and sometimes a significant one – though in many cases there is lack of insight into the real costs of support.

Community Water Plus (Community management of rural water supply systems) is a research project which aims to gain further insights into the type and amount of support that is needed for community-managed water services to function effectively.

1.1 Overall objectives of the research and research questions

This research investigates 20 case studies of reportedly 'successful' community-managed rural water supply programmes across India in order to determine the extent of direct support provided to sustain services with a valid level of community engagement. The expected outcome – based on the empirical evidence from the 20 cases - of the project is to have a better understanding of the likely resource implications of delivering the 'plus' of successful community management 'plus', for different technical solutions, at a level of competence and bureaucratic involvement that is indicative of normal conditions across many low-income countries, and the possible trajectories for institutional development of effective support entities for community management.

In order to achieve that outcome, the project focuses on the following main research question:

What type, extent and style of supporting organisations are required to ensure sustainable community managed water service delivery relative to varying technical modes of supply?

This is further broken down in the following specific questions:

- What are the current modalities of successful community management and how do they differ in their degrees of effectiveness?

- What supporting organisations are in place to ensure sustainable water service delivery relative to alternative modes of supply?
- What are the indicative costs of effective support organisations?
- Can particular trajectories of professionalising and strengthening the support to rural water be identified?

This report provides the results from the case study of community-managed pipe water supply systems in Ranchi district (Jharkhand). The Village Water and Sanitation Committees (VWSC) that operate as the community service providers in the villages are supported by the Drinking Water and Sanitation Department (DWSD), Government of Jharkhand. The report investigates both the service provision and support received.

This report is divided into 7 sections. Following this introduction, Chapter 2 gives an overview of the conceptual framework and methodology of the research. The following four chapters follow the elements of research in the project. Chapter 3 deals with the Enabling Support Environment, in this case the DWSD, Government of Jharkhand. Its role in supporting rural water supply is explained followed by an assessment of its performance and partnering. In Chapter 4, the four community service providers are introduced and their performance assessed. Chapter 5 presents the results from the household surveys and assesses service levels users receive. This is followed by an analysis of the costs associated with support in Chapter 6. Finally, Chapter 7 gives a summary and of the findings and conclusion.

1.2 Concepts and methodology

Community-management remains the predominant approach for rural water supply services delivery in low-income countries. It originated in response to the perceived limitations of the 'public works department' phase, and built on the insights around appropriate technology, eventually leading to the present 'community management' paradigm. Though this has undoubtedly brought benefits (Schouten and Moriarty, 2003; Harvey and Reed, 2006; Lockwood and Smits, 2011) and is often the most appropriate service delivery model, evidence shows that the community management approach is necessary but not sufficient for sustainable services (Harvey and Reed, 2006; RWSN, 2010).

The hypothesis is that sustainable services delivery requires a combination of community engagement and community management of appropriate technology with the necessary government institutional support (potentially including a level of out-sourcing to the private sector). We see that there is the need to professionalise the support elements of community-management in order to provide on-going support. The needs and possibilities for this differ widely and the need for institutional/functional segmentation and resulting differentiation of support, most likely according to technology use, needs to be further investigated.

Ultimately, we believe that for successful community management, proper support is needed to deliver water services that are: *effective* in terms of quantity, accessibility, quality and reliability; *equitable* in that all rural households can access services irrespective of gender or social status, indeed that there is a bias towards the poorest who most benefit from good public health provision; sustainable or *viable*, in that there are adequate resources available, from whoever, to ensure the continuation of the service; *efficient* such that the minimum resources are used to deliver the desire

quality of outputs; and *replicable* such that approaches can work at scale across different localities, not being dependent upon particular situations or leaders.

Building on these principles and applying general insights from the theoretical literature on participation and partnerships, the research identifies several "community-engaged approaches" to ensuring the fulfilment of the human rights to water. These are illustrated in Figure 1 below and include: 1) direct provision with community involvement, 2) community management with direct support and 3) professionalised community-based management. These three broad approaches represent different levels of balance of what communities themselves do, and the extent to which they are supported by external agencies. We believe that these different approaches are closely related to factors such as average income levels, cost of technology, development status and context and that across the demand and cost continuum it is expected that the intensity of community involvement will vary.

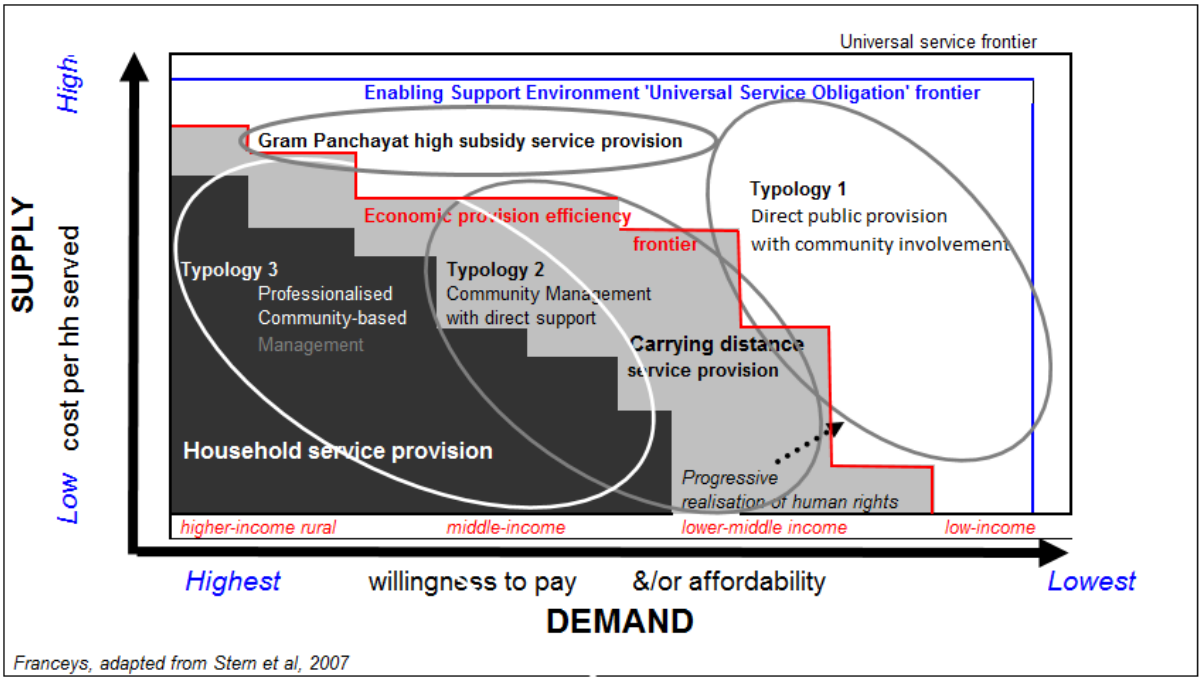


Figure 1: Application of plus approaches in relation to demand and costs of water supplies.

Source: adapted from Franceys and Gerlach (2008) after Stern et al. (2007)

Key to all three models is the presence of what is called an 'enabling support environment' within the Indian context. The enabling support entities (ESE), that make up this environment, fulfil what Lockwood and Smits (2011) call service authority and monitoring functions, such as planning, coordination, regulation, monitoring and oversight, and direct support functions, such as technical assistance. The main objective of such support is to help communities in addressing issues they cannot solve on their own and gradually improve their performance in their service provider functions. Within this research, we will seek to classify the varying types of community management and the necessary enabling support environment, and get a further understanding of which models are functioning best. An interrelated objective will be to identify the resource implications of this *plus*, economic as well as financial, which is needed to deliver demonstrably successful, sustainable water services across these typologies.

The focus of this research is thus to investigate successful cases of community-managed rural water supplies, and in that assess the type and size of support that has been deployed to make it successful. What can be considered successful can be understood at various levels: at the level of service that users receive, at the level of the service provider carrying out its tasks with a certain degree of community engagement, and at the level of partnership between the support entities and the service provider. The research will therefore assess the degrees of success across various elements, as summarised in Figure 2 below, and further elaborated below.

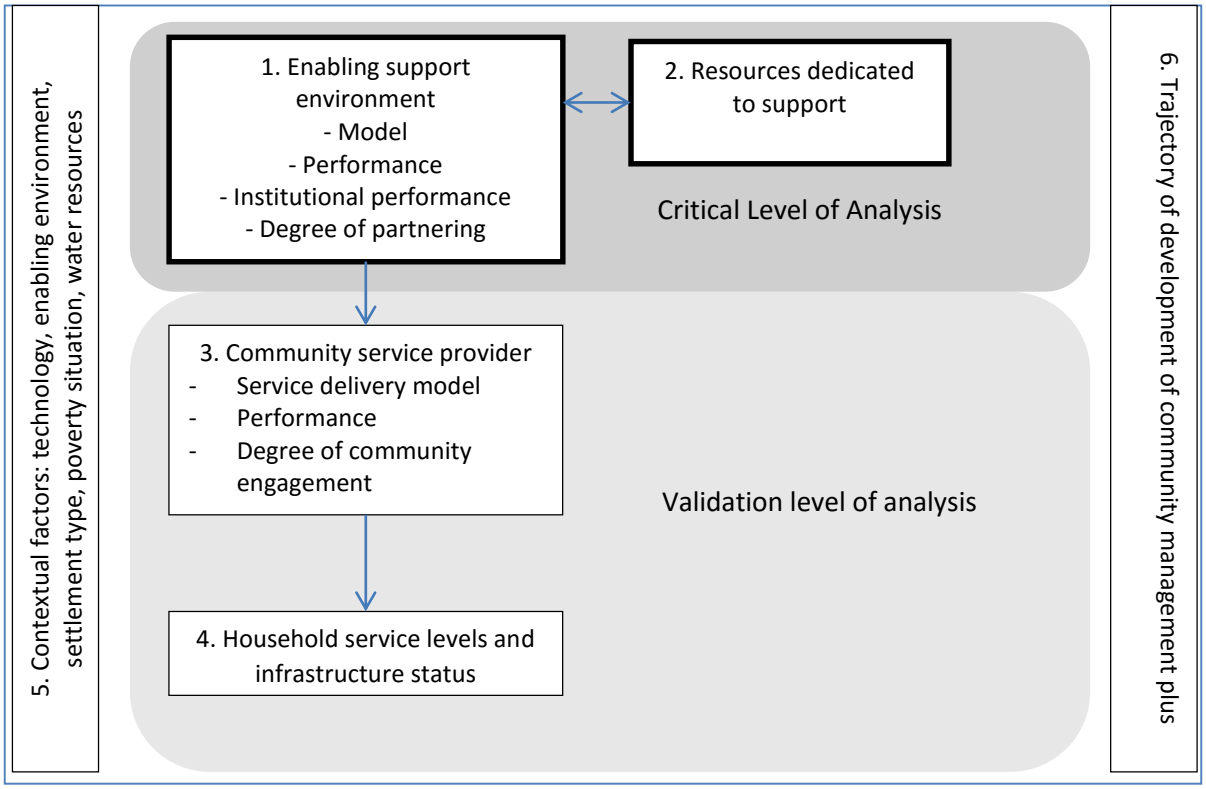


Figure 2: Elements of the research

This implies the following:

1. **Enabling support environment.** To assess the degree of success in support, we look into the following elements:

   - We describe the ***enabling support environment model***, by defining which type of entity (or entities) fulfil these roles, and the relationships between them.
   - ***Performance of the enabling support environment***. This refers to the degree to which the support entities are fulfilling their roles adequately, against a set of performance indicators.
   - ***Institutional performance***. This entails the internal institutional process such as leadership, organisational culture and community orientation that allow the external performance to happen.
   - ***Degree of partnering***. This is a description of the type of partnering between the enabling support entity and community service providers, using the partnership categories defined by Demirjian (2002).

2. **Resources dedicated to support**. This refers to the resources dedicated to the various functions carried out by the enabling support entities. This refers both to the monetary costs (as per the cost categories) as well as non-monetary ones, such as presence of skilled staff and political capital. We will quantify both financial and human resources and provide a qualitative description of other resources, like political capital, that are spent on this. In this, a differentiation will be made between the different life-cycle cost categories: Capital Expenditure (CapEx) during project implementation- particularly the 'software' part, the Operation and Minor maintenance Expenditure (OpEx), Capital Maintenance Expenditure (CapManEx) and direct support costs (Fonseca et al., 2011).
3. **Community service provider**. To validate that the support has been successful, we assess the degree of success of the service providers supported by the ESE through three elements:

    - ***Service delivery model.*** This refers to description of the entity that carries out day-to-day operations and maintenance and administration, and the degree to which the entity may have professionalised certain tasks, e.g. to a paid-for caretaker or mechanic, and its scope and scale of operations.
    - ***Performance***. This refers to the extent to which the service provider is fulfilling its roles in operation, maintenance and administration adequately, as defined by formal regulations or general good business practices.
    - ***Degree of community engagement in service provision***. We believe that community engagement in service provision is a good thing per se, as it empowers users to take appropriate levels of responsibility and oversight over their water services. We will assess the degree of community engagement, based on the ladders of participation (based on Pretty (1994), adapted from Adnan et al. (1992).

4. **Household service levels and infrastructure status**. Whether a water service can be considered successful is eventually measured by the characteristics of the water supply that users eventually receive, i.e. the service level. In this, we will look at aggregate service levels, as well as their break-down between the constituting elements, including water quantity, quality and accessibility. In addition, it will be disaggregated for different groups within a community, to assess equity in service levels. We will complement data on service levels, with data on the status of the infrastructure.
5. **Contextual factors.** We recognise that what might be required to be successful in one case may not be adequate to be successful in another. Specifically, we will describe the type of technology employed, the socio-economic and poverty status of the community and the type of settlement and the water resources situation.
6. **Trajectories.** Last, but not least, we recognise that the organisational partnerships between communities, service providers and support agents have a particular history and trajectory of development that is often not replicable to another situation. Still, insights in the various trajectories of development of these *plus* partnerships may help identify common elements to take into account when promoting such partnerships elsewhere. Therefore the research provides a qualitative description of the trajectories of development of partnerships will be undertaken.

1.3 Case study selection

In selecting twenty successful case studies, the research has scanned over 161 community-managed rural water supply programmes in India, covering a combined population of nearly 50 million people.

Through a detailed process of selection using both secondary data and pilot visits, 20 programmes were selected to become case studies.

The research is interested in investigating (relative) success across a variety of socio-economic, political and environmental contexts that are indicative of the 'normal operating conditions' in India. It was therefore important that the research took up case studies in some of the poorer states of India, even if the level of success found there was not as high as can be found in some of the richer states. In this regard, part of the scanning exercise was devoted to finding successful cases in such states that led to the selection of a case study focused on the Drinking Water and Sanitation Department (DWSD), Government of Jharkhand. The DWSD is charged with providing potable and sustainable drinking water supply and sanitation services to the people of Jharkhand. In rural areas, it works through a model in which it supports Village Water and Sanitation Committees (VWSCs) that take on the service delivery tasks associated with water supply.

Consultation with DWSD staff led to the selection of high performing villages under this scheme. Based on this exercise, it was decided to focus on the Ranchi (West) division with Bero, Khijri and Rai Bazar villages taken as examples of good practice. *Brambe* village was taken as control village since despite being supported by DWSD, this village does not get the same amount of support compared to the other villages. A map showing the location of Ranchi district in the state is given in Figure 3.

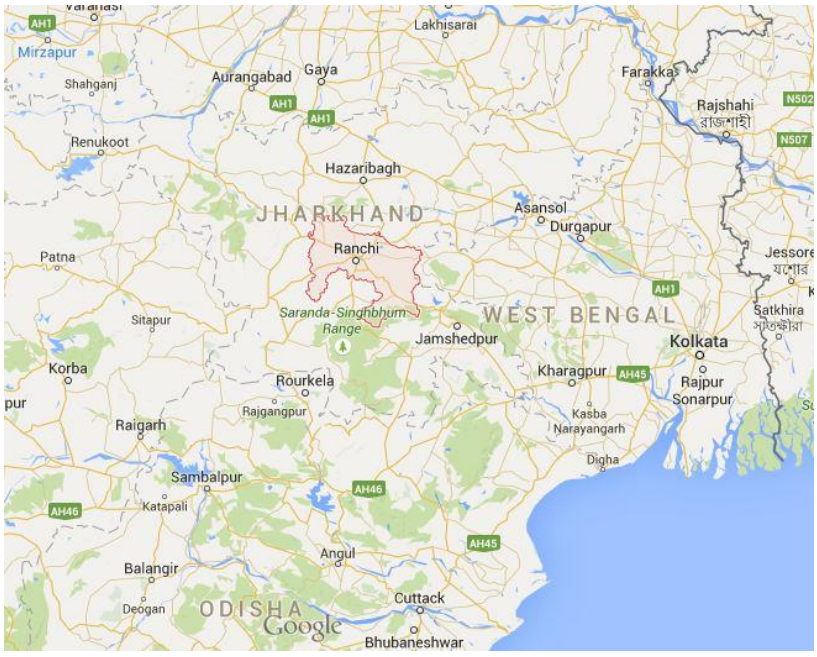


Figure 3: Location of Ranchi district in the state of Jharkhand (Source: maps.google.com

1.4 Data collection and analysis

The data collection for this case study was designed to gather information on each of the research elements using both primary and secondary data. The methods of data collection involved key informant interviews, focus group discussions and household surveys. Table 1 depicts the sources of data and methods of data collection at different levels. The data collection was carried out from 2 August to 17 September 2014.

Table 1: Data sources and methods of data collection

Unit of Analysis	Sources of Data	Methods of Data Collection

Enabling Support Environment (ESE)	**Secondary:** Published and unpublished materials from DWSD office, Ranchi (West) Division	**Secondary:** Review of information availed from collected materials
	Primary: Officers and staff at various levels from DWSD office, Ranchi (West) Division and SPMU, DPMU Office, Ranchi	**Primary:** 8 Key informant interviews with officers and staffs through interview guide
Community Service Provider (CSP)	**Secondary:** Various records and books maintained by the VWSC office	**Secondary:** Review of information availed from records and books
	Primary: Members of the VWSC, staff employed by VWSC for water supply	**Primary:** 4 Key Informant Interviews with VWSC presidents; 4 Focus group discussions with VWSC members; 4 Unstructured interviews with water supply staff
Household	**Primary:** Adult members of households	**Primary:** 120 household surveys through structured interview schedule; 4 focus group discussions among villagers

To aid analysis the data were processed in 4 databases at the ESE, CSP, Household and Costing levels. These databases contain scoring tables for the performance of ESE, the CSPs, the degree of partnering and participation and the service levels that users receive (for details of the scoring, see the project's research methodology and protocols (Smits et al., 2015)). Based on these scoring tables an analysis was conducted that sought to characterise the type and performance of the different institutions involved as well as give insight into the indicative cost of this support mechanism.

In the costing section all prices quoted are given in Indian Rupees (INR) and have been converted to 2014 prices. Inflation has been calculated using the construction price index for hardware costs and the consumer price index for other costs, as available from the Reserve Bank of India. Prices in this report have been reported in INR only, apart from the final summary table which is shown also in USD at a INR 60/$USD exchange rate plus the purchasing power parity adjustment – see below.

2 Enabling Support Environment Level

This section focuses on the support organisations that make up the Enabling Support Environment (ESE) for rural water supply in Jharkhand. For this case study, it means focusing on the DWSD, Government of Jharkhand, with an emphasis on the DWSD Ranchi (West) division.

2.1 Background and origin of the ESE, and context in which it operates

Jharkhand is one of the newest states of India having been carved out of the state of Bihar on 15 November 2000. This made it the 28th state of the Union of India. It consists of 24 districts that are divided across 260 administrative blocks and 4,564 Gram Panchayats[1]. The state is among the poorest in India coming 19th out of the 23 measured states in terms of the Human Development Index (Planning Commission, 2011). It is also home to one of the highest proportions of Scheduled Tribes (ST) and Scheduled Caste (SC) across India with these groups representing 40% of the 33 million people that live in the state. Historically, during the British period, Jharkhand was a part of one of the four divisions of Bihar state and was called the Ranchi division. The Public Works Department (PWD) was charged with rural water supply alongside other responsibilities such as irrigation and infrastructure developmental works. After independence, drinking water was separated from PWD and a new department called Public Health Engineering Department (PHED) was created that operated across Bihar. In 2000, following the formation of Jharkhand, the Ranchi division of the Bihar PHED became a Government of Jharkhand agency and in 2002 it was also given the responsibility of sanitation alongside drinking water. This lead to current day structure of the department and its renaming as the DWSD.

2.2 Enabling support environment description

This section describes the institutional structure of water and sanitation programme in Jharkhand state.

At the state level DWSD is organised in two units: the State Water and Sanitation Mission is responsible for implementation of hardware, whilst the State Programme Management Unit (SPMU) is responsible for monitoring the programme. Each unit also has a body at the district level. During the study, it was found that this separation was not entirely clear in reality and that both worked as part of the same department, therefore the distinction between the two is not made in the remainder of the report.

At the block level there is a Block Resource Centre (BRC), which is an NGO hired by DWSD with the mission of building the capacity of community service providers through training and support. However, it was found that the BRC in the studied villages did not provide this training and capacity building, due to understaffing and accountability issues. The little work done by the BRC was only focused on sanitation, which is why it was decided not to include them as a separate support entity.

[1] A Gram Panchayat is the village-level local self-government found in India, which is responsible for providing a number of services, including water supply

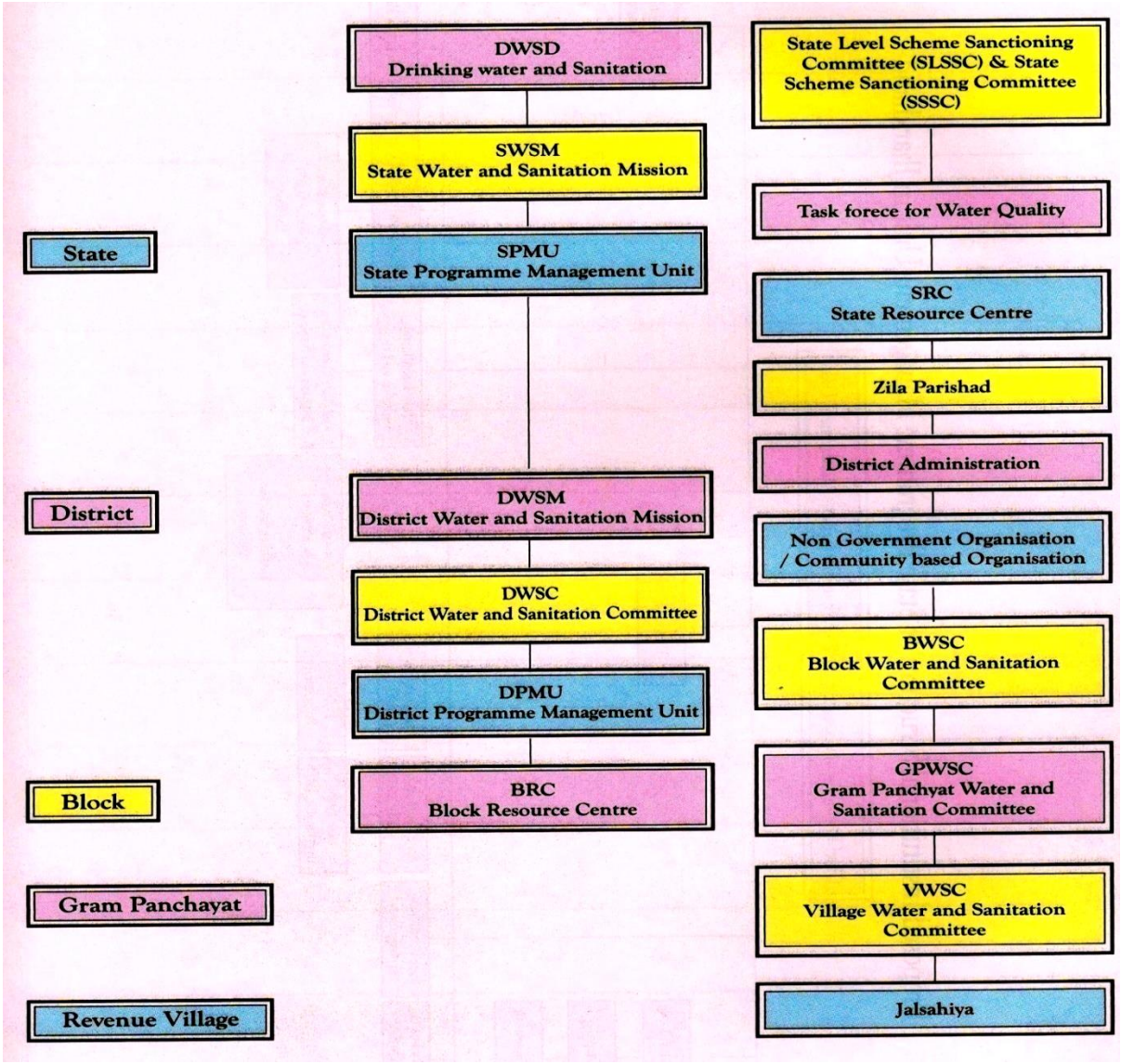


Figure 3: Institutional Structure of Water and Sanitation Programme in Jharkhand

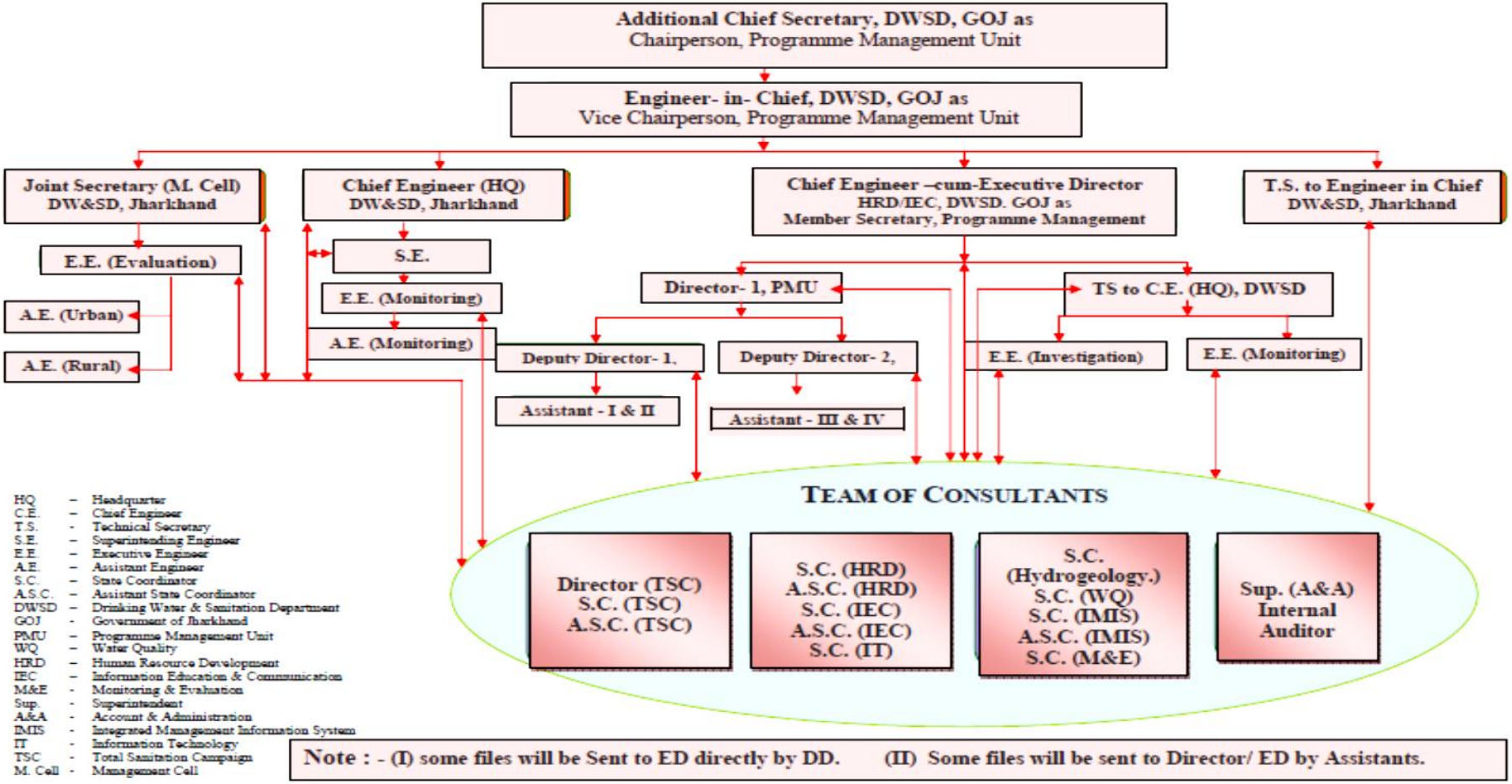


Figure 4: Organogram of Drinking Water and Sanitation Department, Jharkhand.

The above institutional set-up and internal structure is designed to enable the DWSD to meet its stated vision and mission:

Vision of DWSD

- Ensuring safe, sustainable and adequate drinking water cost effectively and contribution towards a healthy and dignified life through good sanitation and hygiene practices with community involvement for the people of Jharkhand.
- Every household must always be clean
- Every household must use safe water.

Mission of DWSD

- To Improve the quality of life through improved use of safe drinking water; thereby reducing incidences of water borne diseases and enhancement of productivity of people.
- To provide knowledge of cost effective technological option for enhanced access to water for informed choice making by community.
- To involve local communities in operation, maintenance, usage and water tariff collection leading to improved functioning and usage and empowerment of user groups.
- To facilitate the conversion of latent demand for better sanitation and hygiene solutions through enhanced awareness leading to finally adoption and usage.
- To ensure the catalytic role schools and children can play in transforming rural hygiene practices.

From reading the vision and mission it is clear that the DWSD has an integrated approach focusing on both water supply and sanitation to improved public health and wellbeing. For this case study we have focused on the role the department plays in water supply but acknowledge this is only part of the support it provides to villages.

Now focusing on the DWSD at a more local scale the exact set-up for the DWSD Ranchi (West) division is described in Table 2. The division provides support to 745 VWSCs covering a total population of 11,893,459 people as per 2011 census. For this purpose, it employs 80 full time staff that comprises Engineers, Technical Staff, Finance Staff, Administrative Staff and Logistical Support Staff. Out of them, 17% have professional degrees like B. Tech. and Diploma in Engineering, 23% have either graduate or post graduate degrees, 19% reach an intermediate education status, 26% have studied between 6th to 10th standard and 15% have studied between the 1st to 5th standard. This indicates a relatively highly skilled workforce with those working at higher levels or in specialist technical roles having the appropriate qualifications for their posts. However, there is a strong emphasis on technical skills and engineering and little know-how in areas such as community mobilisation or social sciences.

Table 2: ESE descriptors

Parameter	Number
Total Number of VWSC Supported	745
Total Number of Population Served	11,893,459
Total Number of Full Time Employed Staff	80

2.3 Enabling Support Environment Support Activities

This section describes the support activities of DWSD and the broader set-up of the ESE. As can be seen from Table 3, the DWDS generally follows a supply-driven model in which it provides a number of support activities. It is supposed that the high level of support provided through the DWDS is because the VWSCs in the villages are in a relative nascent stage of development and yet to be strong enough to take on the financial and administrative challenges associated with water supply.

In the studied villages a very close, but informal, support relationship with department engineers could be observed. In two villages, Bero and Khijri, the Junior Engineers responsible for the respective area have their offices next to the water supply schemes. Therefore, they are often approached by VWSC members with questions about scheme management, repairs or other issues. The two other schemes also get frequent visits by Junior and Assistant Engineers; Rai Bazaar because it is a relatively new scheme and therefore gets a lot of attention from the department and *Brambe* because the village is centrally located and the engineers pass through it regularly and therefore visit the VWSC. Part of regular maintenance is also done by department staff. In all villages plumbers, mechanics, electricians and masons employed by DWSD provide assistance for maintenance on a request basis. DWSD furthermore pays the electricity bills for all studied schemes, which represent a major part of operating expenditure. Further capacity building of these community service providers, along with increased tariffs and a higher number of consumers would be needed if the DWDS were to reduce its support but in the meantime it is necessary for the DWDS to maintain this level of support.

Some support activities should be performed by the Block Resource Centre (BRC), an NGO. However, no evidence of this support could be found. The activities done by BRC were found to be very limited, and completely confined to sanitation. Ensuring that BRC performs its duties, or finding alternative ways of conducting these activities would improve the overall support environment.

DWSD is training a VWSC member, the ‘Jal Sahiya’, on minor repairs, water quality testing and book keeping. However there is no mechanism for retraining if the Jal Sahiya in a village changes. Implementing a system where a newly appointed Jal Sahiya receives training would ensure that capacity is not lost.

Table 3: Support provided by DWSD

Type of activity	Is this type of activity undertaken?	Modality of support	Way of providing support
Monitoring and control (auditing)	Yes	Supply based	Monitoring of the scheme functionality is done by DWSD engineers. For the purpose of auditing, private auditors are hired on need basis and they submit their audit report of the VWSCs to DWSD
Water quality testing	Yes	Supply based	Water quality testing kits are provided to VWSCs, responsibility lies with the Jal Sahiya. Testing should be done before and after the monsoon, however not done in all villages. DWSD engineers also supposed to take water samples twice a year
Water resources management	No		
Technical assistance	Yes	Both (On request and supply based)	Engineers of DWSD provide technical support to VWSCs in preparation of Detailed Project Reports[2] for establishment of new structures, extension and in case of major break downs. DWSD also provides support for day-to-day operation, e.g. management of the scheme, plumbing and electrical work.
Conflict Management	No		The BRC should provide support for conflict management, however no evidence of this support could be found
Support in identifying investments needs	Yes	Both (On request and supply based)	Support in identifying hamlets to expand water supply to, then help in preparing Detailed Project Report to get funding for it
(Re)training of service provider	Partial	Supply based	DWSD conducts training programmes for VWSC members and Jal Sahiyas, but not in regular intervals.
Information and communication activities	Yes	Supply based	DWSD develops IEC materials like posters, handbills, booklets etc. and supplies to the VWSCs from time to time for awareness generation among the villagers.
Fund mobilization	Yes	Supply based	DWSD pays electricity bills, as well as an annual grant matching the amount collected through tariffs. DWSD also mobilises funds for system expansion or major repairs through the preparation of a Detailed Project Report

[2] Detailed Project Reports are the basis for implementation of new schemes and major expansions or augmentations by DWSD. They contain the system design as well as cost estimates are prepared by the local Junior Engineer, and sanctioned by senior staff. After sanctioning a tender is floated and the work done by a contractor

Table 4 depicts the activities and responsibilities that are undertaken in support of rural water supply across the whole ESE, including both DWSD and other institutions. It covers the following factors for a number of key tasks:

- **Responsible** – the actor or entity that is responsible for the completion of a specific task.
- **Involved** – those actors or entities who directly contribute to the completion of a specific task.
- **Interested** – those actors or entities that are likely to be affected by a specific task.
- **Paying** – those actors or entities that cover the costs of an activity, but do not carry it out directly

It shows that whilst the DWSD is the primary agency responsible for rural water supply, a number of other institutions are also involved. Funds are mobilised at the Union and State government levels and channelled through DWSD to implement new schemes. DWSD is also responsible for other capital-intensive activities such as capital maintenance or major repairs. The actual scheme implementation and major extensions or repairs are performed by private contractors, through a tender floated by DWSD.

According to its operational policy, DWSD works with a local NGO for continuous capacity building and training within villages. However, this cooperation was found not be effective in the studied villages. Although the BRC exists, its activities were very limited and confined to sanitation. No training or support for water supply was given by the BRC. Ensuring that the BRC fulfils these functions, by increased funding and better oversight; or shifting the responsibility for on-going software support to another agency would be a way to ensure this support reaches the communities.

The Jal Sahiya, VWSC president and vice-president receive training from DWSD, however there is a lack of ongoing software support, especially after the Jal Sahiya or VWSC change; it was found that the newly appointed Jal Sahiya often did not receive the training. On the village level, the VWSC is responsible for service delivery whilst receiving financial and technical assistance by DWSD.

Table 4: Activity and responsibility matrix

Entities / Actors	Tasks / Activities																		
	Allocation of	Monitoring	Project planning	Infrastructure	Social	Operation and	Ongoing software	Water resources	Capital	Major repair	Approval of user	User charge	Management of	Community	Dispute	Paying of water	Institutional &	Auditing	Evaluation/perfor
Central Government	PAY							PAY											
State Government	INV	INV	INV					RES + PAY						INV + PAY			INV + PAY	PAY	
DWSD	RES + PAY	RES + PAY	RES + PAY	PAY	RES	PAY		INV	RES + PAY	PAY				INV			INV	RES + PAY	RES
Local government/ Gram Panchayat					INV			INV					INV		INV		INT		
Formal private enterprise				RES						RES									
NGOs (BRC)					RES								INV	RES	INV		RES		
Water committee (VWSC)	INT	INV	INV		RES	RES + PAY			INV	INV	RES	RES	RES	INT	RES	INT	INT	INV	INV
Operator or mechanic				INV		RES			INV	INV									
Households		INT			INT						INT	INV	INT		INT	RES			

2.4 Enabling environment performance indicators

Whilst the previous sections gave a description of DWDS, this section provides an assessment of its performance. This exercise was conducted using specialist Qualitative Information System indicators that were developed for this project and that rate the professionalism and performance of rural water supply support entities. They cover a number of different aspects including the formality of the mandate for support, working methods, information management, communication and client satisfaction. Table 5 describes shows the scores for each indicator on a scale from 0 to 100, along with explanations for the scoring.

Table 5: ESE performance indicators

Indicator	Explanation	Score
Formality of the mandate for support	DWSD follows the NRDWP guidelines and sets its own target for rural drinking water supply as per the state implementation plan. Clear vision and mission and policy mandate	100
Working methods	Although standardised tools and methods exist for most support activities, they are not always used	50
Information management	No systematic way of tracking performance of service providers exists, only informal knowledge through field staff	25
Communication between service support authority and service providers	DWSD staffs posted at the block level are easily accessible to the VWSC members and general public apart from the toll free number (which is meant for issued with handpumps, but is often used for PWSS as well). DWSD responds to complaints and tries to solve issues.	75
Tracking client satisfaction	There is no specific method in the DWSD at the ESE level to assess the client satisfaction, it only has an implicit understanding of it	25

2.5 Enabling environment institutional assessment

After discussing how the DWSD performs in its role as a support agency, this section seeks assess the internal characteristics and strengths of the organisation through an institutional assessment on various indicators developed for this project. Through a series of questions these areas were scored on a scale from 0 to 4 – with 0 reflecting low and 4 high scores. Figure 4 gives an overview of the scores whilst each component is discussed below.

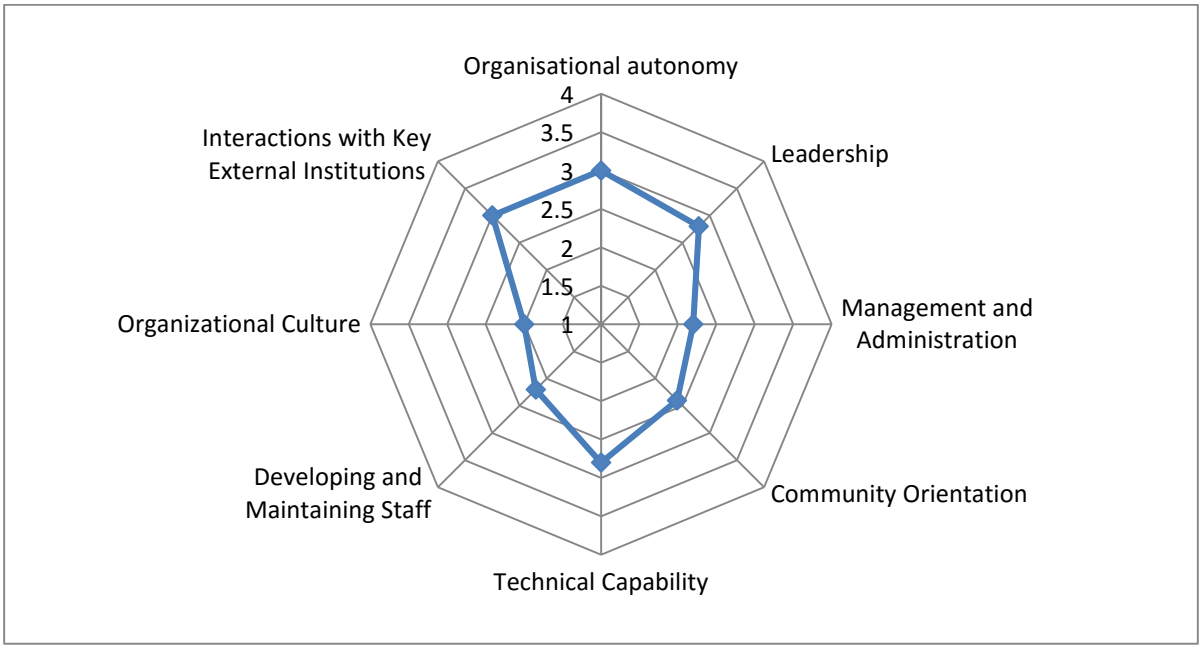


Figure 4: ESE institutional assessment

Organizational Autonomy: The DWSD is funded through both centre and state government funds so must response to the priorities of government, as specified in the NRDWP. The organisation builds on these guidelines and every year set its own targets and prepares an implementation plan with budgetary allocation for it.

Leadership: The DWSD has good leadership and instils a sense of mission in its employees. The leadership assesses the performance of their staff and based on their skills roles and responsibilities are assigned. In the last five years innovative decisions were made such as supporting villages that have autonomously moved towards piped water systems. This was achieved by taking out advertisements in local newspapers that offer the support of the DWDS in terms of technical and financial matters for any villages wishing to develop their own systems. Such provisions may not have been recommended by the NRDWP guidelines but the leadership at DWSD believes that such measures are needed to expand access to piped water.

Management and Administration:

Supporting the top-level leadership in the DWSD are team-leaders. This group of managers are aware of theirs roles and responsibilities and can communicate the organisational objectives to the rest of the team. Generally, clear procedural practices are in place meaning that employees are aware of their tasks and are accountable for meeting them to scheduled times. The DWSD, however, currently

lacks a well-organized management information system to track administrative work but an effort to manage these tasks is undertaken based on a 'target versus achievement' approach – and the department is now developing a management information system for this purpose. Current administrative systems for accounting and human resources were found to be operating quite poorly.

Community Orientation:

Some sense of orientation towards serving the community could be observed in the organisation, however no special efforts are made to educate communities about services offered by the department.

Technical Capability:

The DWSD is a technical department and therefore has strong technical capability in implementing rural water supply schemes. It seeks to maintain this capability through training, and for example, recently it organised a 5-day training exercise for technical staff with support from UNICEF, Water AID and other renowned agencies. The department in collaboration with UNICEF is establishing the Visvesvaraya Sanitation & Water Academy as a residential training unit for capacity building of key resource persons such as key programme managers and grass root level trainers.

Developing and Maintaining Staff:

Although the department does not have a dedicated, formalised plan for developing and maintaining staff they do provide various opportunities for professional development, including organising exposure visits within and outside the state for staff to learn skills and gain experience on relevant subject matter. There is also an appraisal system for granting or renewing contracts (i.e. for promotion) based on a written examination and assessment of the past performance by senior authorities.

Organisational Culture:

Although the staff agree that DWSD is a good place to work, little team spirit could be observed, which might be caused by a lack of continuity due to staff turnover. However, the higher authorities and leadership are interested and keen to develop the department and hence efforts are made in terms of maintaining physical office infrastructure.

Interactions with Key External Institutions:

DWSD has good interactions with key external institutions and hence the top management stays well informed about external policy, financial, and regulatory issues and actions. Many international, national and local NGOs as well as academic institutions are providing support and technical assistance to DWSD. For example, the department works with the World Bank to implement PWS in some of the tribal dominated district in the state. Another example is that DWSD is coordinating with the Electricity Department in the state to slash the rate of electricity for drinking water abstraction. DWDS brought to the notice of the Electricity Department that although drinking water has been identified as a priority sector as per the National Water Policy, the electricity charges levied for extracting drinking water has been put under the category of low intensity industrial units, making the tariff much higher than for irrigation. These efforts from the department and simultaneous

petitions from VWSCs resulted in the Electricity Department agreeing to reduce the electricity tariffs from Rs 4.40 per unit to Rs 1.10 per unit. This has resulted in reducing the overall operational expenditure for water supply as electrical charges represent a major part of the recurrent costs.

2.6 Enabling environment partnering assessment

In this section an assessment is made on the types of partnering that are found between the DWDS and the service providers it supports. For this purpose, a partnering assessment framework was developed that sought to measure the degree to which the relationships can be characterised by the following six types of partnerships:

- Collaborative. The sharing of responsibility and authority through joint decision-making
- Contributory. Partners pool resources or leverage new funds for implementation and maintenance of service
- Operational. The sharing of working (division of labour) and co-ordinate operations
- Consultative. To systematically obtain and share relevant information to improve service design, delivery, evaluation or adjustment
- Transactional. This refers to the exchange of funds for services or products
- Bureaucratic. This is the partnering to fulfil regulatory or normative expectations regarding the need for partners to work together

As explained in Smits et al. (2015) these types of partnering do not imply any hierarchy and a partnership may have elements of all these six types of partnering. The assessment is made here for each of the stages of service delivery cycle. Figure 5 presents the overall scores for partnering assessment whilst the results are justified below.

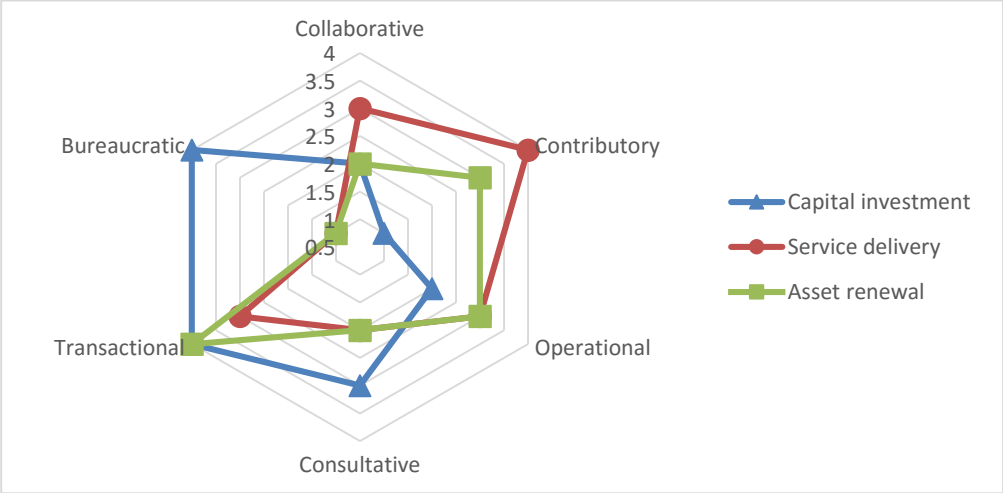


Figure 5: ESE partnering assessment

Overall partnering assessment: Overall, the most prominent type of partnering is transactional. Implementation of new schemes, as well as major repairs follow a request by the community and negotiations with DWSD. In the service delivery phase, there is evidence of collaborative partnering

as well, which shows that DWSD provides financial and technical support for operation and maintenance.

Capital Investment: The DWSD pays for initial capital investment, whilst a private contractor is responsible for implementation. For the preparation of Detailed Project Report, which is the basis of the scheme design, the Junior Engineer consults the VWSC members. However, they can't make major amendments in the design or suggest an alternative technology.

Ongoing service delivery: There is sharing of responsibility between DWDS and VWSCs in administration, management, operation and maintenance. The VWSC is responsible for service delivery through hiring a pump operator, a bill collector or plumber as required. However, department employees also give technical assistance and often help in repairing breakdowns. Furthermore, DWSD pays the committee's electricity bill, which is one of the major running costs.

Asset Renewal: The DWDS does not have an explicit guideline for assets renewal but they provide ad hoc support to VWSCs that need to undertake this task. This varies depending on the situation. The VWSC sometimes replaces motor pumps from its own funds, as in Bero village, but the DWSD can be approached for assistance if the renewal exceeds the service provider's capacity.

Service Enhancement or expansion: For service enhancement and expansion, VWSCs are meant to be supported by the DWSD but no specific evidence on the partnering during this phase was gathered on this as part of this study.

3 Community Service Provider Level

Having seen the type and performance of the enabling support entities, this chapter assesses the performance of the community service providers. As indicated in the conceptual framework, the service provider assessment is above all a validation of whether the support that has been provided indeed leads to well-performance community service providers. To do so, this chapter first provides the context of the villages where the validation took place, describing their history of water development. This is followed by the assessment of their respective service providers, using the descriptors and indicators and participation scores set out in the project methodology. Although a majority of people in the studied villages still depend on private wells or handpumps, the focus of this study is on piped water supplies, as they are the are managed by the community service providers and are the DWSD's main focus for the future.

3.1 Context

For the present study, four villages from Ranchi district have been selected to be part of this validation. The district is the most populous of 24 districts in the state with a population of 2,912,022 across 303 Gram Panchayats and 1,296 villages. It is headquartered in the city of Ranchi that is also the state capital. As one of the 250 most backward districts of India, the district receives additional funds under the Backward Regions Grant Fund Programme (BRGF) form the central government. Under DWSD, Ranchi district has been divided into Ranchi West and Ranchi East divisions. The four villages covered in the present study – Bero, Namkum-Khijri, Rai Bazaar and *Brambe* – belong to the Ranchi West division. Out of these four villages, the first three – Bero, Namkum-khijri and Rai Bazaar – have been taken as best practice cases with good support from the department whereas the fourth village, *Brambe,* has been less successful in managing drinking water provisioning due to inadequate support and is taken as the control village. The location of the villages is shown in Figure 6 and key information on the four studied villages is given in Table 6.

Figure 6: Village locations (source: maps.google.com)

Table 6: Basic village information

	Bero	Khijri	Rai Bazaar	*Brambe*
Population	7,193	5,936	6,977	4,230
Households	1,557	1,160	1,351	750
Household connections	235	218	572	132
Percentage SC	1%	3%	8%	1%
Percentage ST	55%	46%	5%	67%
Year of implementation/rehabilitation	1990s/2010	2009	2013	2000/2007
Technology	Groundwater	Surface water	Surface water	Mixed
Handover to VWSC	2011	2012	2013	2011

Bero was is one of the first villages to receive a piped water scheme from the department in the early 1990s. However, the scheme fell into disrepair and before the rehabilitation in 2010, only around 30 households out of more than 100 connections actually received water from it. Bero has also been awarded the 'Nirmal Gram' (clean village) status, meaning that all households have access to improved sanitation facilities.

Namkum Khijri village is located on the outskirt of Ranchi city. The water scheme in the village is surface water based and fed by the nearby Subarnarekha River. Initially users were sceptical about the water quality, because the intake structure is situated in the vicinity of the cremation ground near the river. However, after awareness campaigns conducted by the department and the good experiences made by the fist users, the community was convinced and a lot households have applied for private connections, which led to a plan for expansion of the distribution network in the village being developed currently. The village also has a Reverse Osmosis (RO) plant operated by *Water Life* and built with World Bank assistance. However, most customers of this RO plant were residents from Ranchi and only a small minority of people in the village get their drinking water from it. Furthermore, it is not managed by the community or has any operational cooperation with the VWSC, therefore it was decided not to include it in this study.

Rai Bazaar is situated in a mining area and faced drinking water scarcity in the late 1980s. Due to mining activities the water table declined rapidly and many wells, the traditional source of drinking water, dried up. A lot of people had to get their drinking water from the nearby Safi River and water fetchers charged 3-4 INR per *bhar* (can of about 25 litres). At this price a family of 5, requiring 4-5 *bhars* a day, was spending about 500 INR a month, which would be even higher in today's prices. An attempt to implement a piped water supply scheme around 1990 failed due to the political instability and Naxalite presence in the area, because the contractor did not agree to pay protection money to the Naxalites. The current system was successfully implemented in 2013 by a local contractor and with greater cooperation of the villagers, especially the youth.

In the control village, *Brambe* there are design problems in the pipe distribution network and a lack of storage capacity to meet the current demand, leading to sub-optimal performance of the water supply system. Users are dissatisfied with the service, resulting in a high non-payment rate. A large number of consumers use booster pumps to suck water from the pipe, which leads to the other

households not receiving any water. A group of entrepreneurial individuals have developed their own water source and storage and distribute it through the government pipelines at a higher price.

Private water entrepreneurs in Brambe
In *Brambe*, one hamlet at the tail end of the network does not receive any water from the VWSC scheme. A group of entrepreneurial individuals constructed a borehole with a motor pump, at a cost of about INR 450,000. They pump water to a storage tank on the roof of a house and supply it to about 35 household in the area. They use the existing distribution network and collect INR 100 from their customers, but are not affiliated to the VWSC at all.

3.1.1 Socio-economic status of the villages

In order to determine service levels, a household survey has been conducted with 30 households in each village. A socio-economic overview of these households is given in Table 7. Hindus constitute the majority religious group in Bero, Khijri and Rai Bazaar, whereas Christians are the majority in *Brambe*, the control village. Similarly, except for Rai which is dominated by BCs, the rest of the villages STs are in majority. A closer look into the level of educational attainment reveals similarities across villages with the share of graduates quite low at less than 20% and a large share of the population below matriculation level (57% -77% of the population).

Table 7: Social indicators of surveyed households

Social Indicators		Bero	Khijri	Rai	*Brambe*
Religion	Hindu	55%	37%	90%	10%
	Muslim	0%	0%	10%	27%
	Christian	12%	20%	0%	37%
	Sarna	33%	0%	0%	0%
	Others	0%	43%	0%	27%
Caste	BC	15%	17%	63%	3%
	General	0%	3%	0%	0%
	MBC	0%	0%	17%	0%
	OC	18%	17%	0%	30%
	Other	9%	0%	0%	0%
	SC	0%	7%	13%	0%
	ST	58%	57%	7%	67%
Education	Illiterate	18%	10%	20%	17%
	1st to 5th class	18%	20%	20%	20%
	6th to 10th class	30%	27%	37%	20%
	Intermediate	21%	27%	3%	40%
	Degree	6%	7%	17%	0%
	Post graduate	3%	3%	0%	3%
	Professional degree	0%	0%	3%	0%

	Below matriculation	66%	57%	77%	57%

The economic condition of the surveyed households is presented in Table 8 below. Almost half (48%) the houses are constructed of low-quality materials (Kuccha) in *Brambe*, whereas in the other villages high-quality houses (Pucca) are more common (40% to 60%). The main occupation of the villagers is agriculture or farm labour in Bero, Khijri and *Brambe*, where as in Rai Bazaar, a mining based habitation, most are self-employed or are engaged in business activities. The reported overall income level of is quite low, with the majority (90%) of the household earning less than INR 250,000 in all the villages. Income levels are comparatively lower in the control village, *Brambe*, where 60% of the surveyed households have annual income of less than INR 50,000.

Table 8: Economic indicators of surveyed households

Economic Indicators		Bero	Khijri	Rai	*Brambe*
House type	Kuchcha	30%	3%	7%	47%
	Semi-Pucca	3%	57%	33%	23%
	Pucca	48%	40%	60%	30%
Landless households		6%	17%	7%	0%
Occupation	Agricultural	39%	37%	7%	37%
	Agricultural wage labour	6%	7%	10%	0%
	Govt/regular/irregular non-farm employment	9%	27%	13%	17%
	Self-employment including business	27%	10%	60%	43%
	Student	6%	10%	7%	3%
	Others	3%	0%	3%	0%
	Retired	3%	0%	0%	0%
	Homemaker	3%	0%	0%	0%
Reported annual income (INR)	10,000 or less	0%	19%	7%	10%
	10,001 to 50,000	35%	26%	17%	50%
	50,001 to 100,000	35%	22%	40%	13%
	100,001 to 250,000	16%	26%	27%	17%
	250,001 +	13%	7%	10%	10%

3.1.2 Infrastructure snapshot

All villages have multiple water sources including the studied piped water scheme, hand pumps, private borewells and dug wells. Ultimately, the state aim is to provide all households with PWSS but at present the coverage is quite low in all the four studied villages, as shown in Table 9. As the guidelines of the DWSD discourage provision for public stand posts, the majority of the households depend heavily on handpumps or wells. This case study still focuses on the PWSS system as this is managed by the VWSC whereas the other sources, such as handpumps or private wells, are managed directly by the government or at the household level. The key difference between the villages in terms of PWSS infrastructure is that Bero has a ground water based scheme whilst Khijri and Rai Bazaar use surface water. *Brambe* is mixed scheme drawing water from a borehole and from a nearby river. All schemes are single village schemes except for Khijri, which is part of a Multi Village Scheme,

supplying water to Namkum Khijri and Tumbagutu. For this study, all analysis of this scheme only pertains to Khijri village.

Table 9: Coverage with piped water

Parameters	Bero	Namkum-Khijri	Rai Bazaar	*Brambe*
No of HH	1557	1160	1351	749
Total Population	7193	5936	6977	4230
HH (%) under PWSS	230hh **(16%)**	218hh **(19%)**	572hh **(42%)**	130hh **(17%)**

3.2 Community service provider descriptors

This section describes the VWSCs that operate as the service provider within the villages. It covers the institutional set-up, governance, administration and staffing, equity and water tariffs. Table 10 gives an overview of the four service providers, whilst further details are given below.

All four service providers are organised as formal water committees headed by the President of the Gram Panchayat and composed of 12 people in total, half of which should be women. Members are selected in the Gram Sabha (village meeting) and generally include ward members, heads of other community organisations such as self-help groups and caste representatives. Although the VWSC is closely linked to the Gram Panchayat, it functions independently for all practical matters such as receiving grants from DWSD or making decisions. Following the DWSD policies, every VWSC has to have a Jal Sahiya (Water Volunteer), who acts as treasurer and has the responsibility of communicating decisions taken by the committee to the villagers. The DWSD specifies that this Jal Sahiya must be selected from the village's daughters-in-law, as they will stay in the village with a higher probability than daughters of the village who might go to their husband's village after marriage.

All service provider have paid staff in addition to the committee, the salaries of which are paid from the tariff collection. The number of staff depend on the size and complexity of the schemes. Whilst in Bero only one pump operator and one bill collector are employed, there are two pump operators and one assistant working in shifts in Khijri. Rai Bazaar employs one pump operator, one mechanic and one guard, whilst *Brambe* only has one staff member, a mechanic.

In two villages the number of household connections has increased after the scheme was handed over to the VWSCs. In Bero, this increase was from 135 to 235 connections from 2011 to 2014, whilst Khijri saw an increase from 186 to 218 connections from 2012 to 2014.

Connection rates amongst marginalised groups are significantly lower in Rai Bazaar and *Brambe*, which points to issues with equity. These issues are mostly caused by the settlement patterns. Marginalised groups tend to settle on the edges of the village and these areas are not covered by the pipe network. Although this discrimination might not happen intentionally, steps to connect these hamlets to the system as well would lead to a more equitable system design.

To encourage service providers to set tariffs high enough, DWSD has decided on a minimum tariff of 62 INR per household and month, as well as a 310 INR minimum charge for new connections. Apart

from the very new scheme in Rai Bazaar, all committees have started with the minimum tariff but subsequently increased it to meet more of their operational expenditure.

Table 10: CSP descriptors

	Bero	Khijri	Rai Bazaar	*Brambe*
Type of organisation	Formal water committee	Formal water committee	Formal water committee	Formal water committee
Organizational capacity				
Staffing of governing body of CSP	12	12	12	12
Staffing of the CSP	14	15	15	13
Coverage with household connections				
Number of households with connections	1557	1160	1351	750
Households served by the CSP	235	218	572	132
Coverage with household connections	15%	19%	42%	18%
Coverage with household connections among vulnerable groups				
Number of SC/ST households with household connections	94	10	27	51
SC/ST households served by the CSP	865	58	177	507
Coverage with household connections among vulnerable groups	11%	17%	15%	10%
Financial descriptors				
Tariff per household and month	72 INR	100 INR	62 INR	100 INR
Connection costs	310 INR	410 INR	310 INR	310 INR
Total capital expenditure (INR)	3,392,243	41,536,017	40,463,825	5,370,825

3.3 Community service provider indicators

The performance of the CSP in its functions of governance, administration and staff, finance and operation and maintenance has been assessed using a specialised QIS developed for this project. Scores are assigned on each indicator from 0, denoting low performance to 100 for the highest performance. Results of this assessment are given in Table 12 and explained in depth below.

3.3.1 Governance and staff

In all the villages, VWSC members are selected in the Gram Sabha, but there is no formal document describing this process. At least 50% of the members, as well as 50% of the executive committee, i.e. president, vice president and Jal Sahiya, should be women. This requirement is fulfilled in all studied villages, as shown in Table 11. The VWSC may take most decisions autonomously, however, the

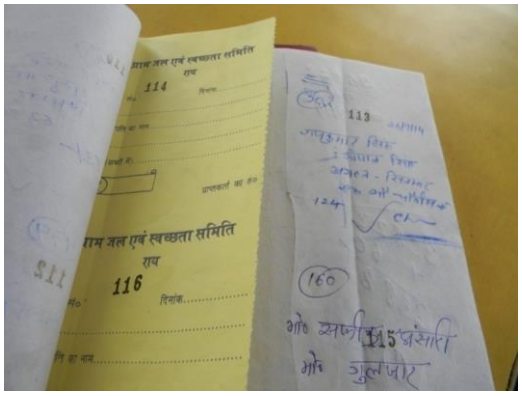
committee brings up matters in the Gram Sabha that is held every month, and acts accordingly. Major decisions such as water tariff increases have to be sanctioned by the Gram Sabha. Through these meetings information is shared and accountability is provided to users.

The DWSD has prepared detailed guidelines for scheme operation in the form a book that the VWSC can refer to. However, this book has so far only been provided to the service provider in Bero. The VWSC president, vice president and Jal Sahiya also receive formal training for their roles from DWSD. The Jal Sahiyas are trained regarding book-keeping and water quality testing. However, it was found that in *Brambe* the Jal Sahiya has been changed three times and the new Jal Sahiya, though found to be quite active and enthusiastic, has not received any training. This suggests that such trainings should be organised on a needs basis rather than at supply-driven intervals.

Table 11: Gender balance in the committees

Villages	Bero	Khijri	Rai Bazaar	*Brambe*
Total members in the VWSC	12	12	12	12
No. of women in the VWSC	7	8	11	7

3.3.2 Finance and tariff collection



All four service providers have separate bank account from the Gram Panchayat. This prevents delays in transferring funds from the Gram Panchayat to the VWSC account, as well as ensuring that money received for water and sanitation is only spent on this purpose. When there was a joint account, Gram Panchayats often spent funds for water and sanitation for other purposes. The main source of credit to the VWSC accounts is the monthly user charge collection. In order to incentivise tariff collection, DWSD has announced that it will provide a grant matching the amount collected after submission of audited accounts. Three of the four service providers already received this matching grant, whilst Rai Bazaar has not applied for it yet, because it is a very new scheme. In all VWSCs except *Brambe* the Jal Sahiya as treasurer maintains records of income and expenditure and produces an annual account which is audited by a chartered accountant. Although this happens, slight discrepancies could be observed and the record did not appear completely systematic, which explains the low scores on the indicator for book keeping. To provide oversight, signatures two of the three executive members of the VWSC, i.e. President, Vice President and Jal Sahiya, are mandatory for all financial transactions.

In Bero there are no defaulters, because users are happy with the water supply in terms of quantity and quality. Users pay their charges to the water tariff collector who goes to every household every month. Most users pay on a monthly basis, whilst some pay 3 to 4 months at once. After taking over the scheme in 2011, the committee took steps to deal with the large number of defaulters and illegal connections. This was done by waiving dues beyond the last year, giving holders of illegal connections a two-month window to regularise their connections and providing an option to pay dues in instalments. These steps, together with a threat of legal action for noncompliance led to a full recovery of the dues and regularisation of all connections. Although this was decided in the VWSC,

the letters informing defaulters of these actions were written on the Gram Panchayat letterhead, leveraging its authority.

In Khijri, and Rai Bazaar users deposit their tariffs at the VWSC themselves. Whilst all users are paying in Rai Bazaar, in Khijri, around 35 households, which are 16% of all consumers, are refusing to pay the user charges because of inadequate water received in their houses. This disruption of service was caused by a road expansion in one of the hamlets, which placed the main pipeline under the middle of the road and makes repairs difficult. Although the DWSD is willing to give assistance in this matter, it is still waiting for permission for repairs from another department responsible for the road.

In *Brambe* there is a large proportion of defaulters, with more than 50% of users not paying user charges, some of them for the last two years. In focus group discussions, residents explained that they are not getting adequate water so they do not feel obliged to pay. Especially users at the tail end don't receive any water. This has led to some users using motor pump to suck water from the pipeline which exacerbates the situation for everyone else.

3.3.3 Technical Performance

The VWSCs are expected to take on the responsibility for operation and minor maintenance of the system, including capital maintenance on short-term assets such as motor pumps. In all the villages, the repairs should be undertaken within 48 hours of reporting. The VWSC in Bero plans to devise a text message based complaints system. Spare parts and repairs for minor maintenance in the main pipeline should be paid out of the VWSC fund, whereas the cost for repairing the distributary network is borne by the concerned consumer. However, it was found that in reality maintenance is also paid for and done by DWSD. In Khijri, the VWSC only collects enough money to pay the salaries of its staff and completely depends on the department for spare parts and repairs. In Bero, because of the close, informal cooperation with the Junior Engineer, he is often called to send the department plumber for repairs.

Water quality testing should be done by the Jal Sahiya twice annually. Evidence of this regular testing could be found in Bero and Raibazaar. In Khijri water quality was only tested once because the Jal Sahiya has the understanding that DWSD would tell her when to do a test again. In *Brambe*, no testing is being done as the current Jal Shiya is not trained for this purpose.

None of the studied service providers uses water meters, nor could activities regarding water security or water resource management be observed. The committee in Bero showed some awareness of source sustainability matters and is planning to make provisions for a check dam in a future expansion plan they have submitted with the department, where water will be brought from the nearby Baridih River.

Table 12: CSP performance indicators

Indicator	Bero	Khijri	Rai Bazaar	*Brambe*
Selection of the board of the service provider	50	50	50	50
Information sharing and accountability mechanisms	50	50	50	50
Cash reserves	100	100	100	100
Book keeping	50	50	50	25

Technical folder	75	75	75	25
Registry of operational information	100	100	100	50
Water metering	0	0	0	0
Water security measures	0	0	0	0
Water quality management	100	50	100	25

3.4 Community service provider participation assessment

In this research as assessment was made of the level of community participation in service provision in each of the villages. Participation is understood functionally as "an active process whereby beneficiaries influence the direction and execution of development projects rather than merely receive a share of project benefits" (Paul, 1987) Using a participation ladder adapted from Arnstein (1968) and Adnan et al. (1992) and specifically designed for this project, the degree of community participation in community service provision is assessed at each stage of the service delivery cycle.

As can be seen in Figure 7, Bero is assessed as showing interactive participation in all phases, which means that decisions are made in cooperation between the service provider and the community. The other best practice villages also show quite high levels of participation, with mostly functional participation, meaning that implementation or expansion plans are discussed and the community can make limited amendments. The control village, *Brambe*, is characterised by passive participation, which shows the low degree of engagement between the community and service provider.

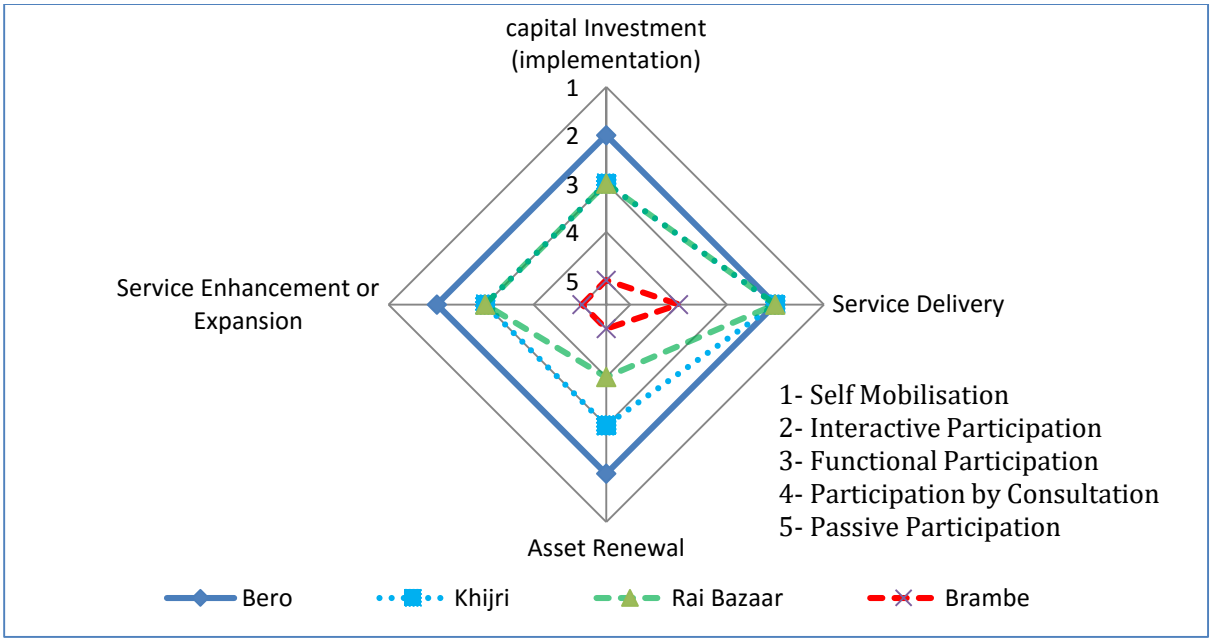


Figure 7: Service provider participation assessment

Capital Investment In all villages, schemes were initially constructed more than 10 years ago, therefore no assessment could be made for this phase. The assessment presented here relates to the rehabilitation of dysfunctional or the construction of the current schemes.

In Bero, an old scheme that was almost completely dysfunctional was rehabilitated in 2010 in very close cooperation with the community.

In Rai Bazaar, implementation of a scheme failed around 1990, partly because the community was not strongly involved in the process. Therefore the DWSD engineers prepared the implementation plan for the current scheme with considerable participation of the villagers. However, the main decision of using surface water was decided by the department.

Photograph 1: Abandoned structure from initial scheme in Rai Bazaar

The community in Khijri was provided with a detailed implementation plan that they discussed and they have a chance to amend limited elements, while setting up the systems which are in place at present.

In *Brambe*, the control village, community members have been informed that project implementation is going ahead as per an externally designed plan and were not involved in the planning process.

Service Delivery In all best practice villages, decisions regarding water supply are made in cooperation between the service provider and the community. The service provider brings up decisions such as amending tariff levels and adding duration of supply in summer months or special festival occasions in the Gram Sabha to decide. This cooperation was found to be strongest in Bero, where the community very actively participated in these meetings. In *Brambe,* community members were found not to participate or bring any change in the service delivery arrangement. This has happened because the users and the wider community are disillusioned and dissatisfied with the service received.

Asset Renewal In Bero, joint-decision making between the community and the service provider regarding asset renewal could be observed. Decisions for example regarding replacing pumps or major repairs are brought up in the Gram Sabha and the community strongly participates in this discussion. In Khijri, these matters are also discussed in the Gram Sabha, but less community involvement was observed. In Rai bazaar there has not been any major asset renewal, however for minor repair and replacement of a few smaller motors (1 HP capacity motor used for chlorination), the community members were consulted but only with limited formal decision making power to demand alternatives. In *Brambe*, the VWSC informs community members about asset renewal as per the plan of the DWSD, but does not involve them.

Service Enhancement and Extension Interaction participation is witnessed in Bero where the community in partnership with the VWSC and DWSD engage in joint-decision making regarding service enhancement or expansion, for example in preparing a new Detailed Project Report for a capacity expansion of the scheme. Khijri and Rai bazaar are characterised by functional participation, where the community is provided with a service enhancement or expansion plan that they discuss and they have a chance to amend with limited elements. In Rai Bazaar, scheme expansion faced hurdles due to unwillingness of some people to allow construction on their land. This issue was addressed in the Gram Sabha and people convinced of the need for expansion. However, further expansion has faced a roadblock as the land through which the main pipeline should go is owned by the Railway Department, therefore there limited scope for the community to intervene. In *Brambe*

the community has been informed about a future expansion plan being considered by the DWSD, but are not every involved due to their negative experiences with the present scheme.

3.5 Community service provider costs

This section presents the various costs borne by the service providers. None of the communities contributed financially to initial implementation, so only recurrent costs are given. Information was gathered through key informant interviews at the service provider level and, wherever possible, confirmed through the accounts. As shown in Table 13, these costs consist almost entirely of staff salaries because the electricity bills are paid by DWSD. DWSD is planning to shift the responsibility for paying electricity charges to the service providers and has negotiated a 75% discounted tariff for water supply with the electricity department. However, so far none of the VWSCs pay the electricity bills, as they feel that their tariff collection is not sufficient for that. Furthermore, the electricity department is unwilling to make the VWSCs pay, because they would pay the discounted tariff of 25%, whilst now DWSD pays the full amount.

All four service providers employ at least one member of staff, apart from paying the Jal Sahiya. The government guidelines suggest paying the Jal Sahiya 10% of the collected tariffs, which is followed in all villages except Bero, where she is paid a flat INR 1200 per month.

The service provider in Bero employs two staff, one pump operator and one bill collector. The pump operator is paid INR 3000, the bill collector INR 1000 per month. Employing a dedicated bill collector might seem an additional cost, but it has helped the VWSC reduce the number of defaulters and illegal connections. Khijri village has a relatively large surface based scheme and employs three pump operators working in shifts; they are paid INR 4500 per month each. The VWSC in Rai Bazaar, a surface water scheme as well, has three members of staff: one pump operator, one scheme attendant and one guard. The pump operator is paid INR 5000, the scheme attendant and guard INR 2500 per month. *Brambe* VWSC employs one pump operator who is paid INR 3000 per month. The higher number of staff in the surface water schemes leads to a markedly higher per capita expenditure, about two or three times.

The service providers' expenses for minor maintenance, spares and chemicals vary across the villages. Whilst the committee in Bero bought chemicals for purification, spares for minor repairs and paid a mechanic for repairing, no evidence for such payments could be found in Khijri and Rai Bazaar. Although this arrangement is not completely clear, there is an informal agreement between the DWSD and these two service providers that, because of the higher staff costs due to the technical complexity of their schemes, the department pays for repairs and spares. The committee in Khijri felt that they were unable to pay for repairs, as the tariff collection was just enough to pay staff salaries.

Table 13: Recurrent costs at CSP level

Particulars of Costs	Bero	Khijri	Rai Bazaar	*Brambe*
Annual salaries for technical staff	48,000	162,000	120,000	36,000
Annual salary for Jal Sahiya	14,400	24,000	36,000	9,600
Spares, repairs and chemicals	8,200	0	0	3,000
Total recurrent costs paid by CSP	70,600	186,000	156,000	48,600
Total population supported	7193	5936	6977	4230

4 Household Service levels

This section details results from the household surveys designed to validate the success by analysing the water supply service levels users receive. It starts with a general overview of coverage levels, then provides details of single parameters and finally looks at equity in terms of water service levels. Service levels are assessed on five parameters: quantity, perception of quality, accessibility, reliability and continuity. The service each household receives is scored for each parameter from 'no service' to 'high'. The 'basic' service level represents the Indian Norms for Rural Drinking Water, therefore any level above that can be seen as acceptable, any level below as unacceptable service.

4.1 Coverage

The sources used by the 30 households surveyed in each village are shown in Table 14. The best practice villages are mostly covered by either household connections or private wells and boreholes, whilst in the control village, almost half of surveyed users get their water from communal sources. One household in Rai Bazaar reported fetching surface water from a nearby river, thereby relying on an unimproved source as defined by JMP.

Table 14: Water sources of surveyed households

	Bero	Khijiri	Rai Bazaar	*Brambe*
Household connection	40%	30%	73%	57%
Private well/handpump/borehole	57%	53%	13%	
Communal well/handpump	3%	17%	10%	43%
Surface water			3%	

4.2 Service levels

The service levels for best practice and control villages are given below in Table 15 and Table 16. It can be seen that overall, consumers in best practice villages enjoy significantly better service, especially in regards to quantity, accessibility and continuity. In best practice villages, 33% of users receive unacceptable quantity, whilst this proportion is 67% in the control village. Interestingly, perceived quality is slightly higher in the control village, and perceived reliability is uniformly high. Tables showing the service level for each village can be found in the Annex.

Table 15: Service levels for best practice villages (n=90)

	Best practice (n=90)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	26%	87%	74%	2%	98%
Improved	9%	2%	0%	9%	1%
Basic	32%	1%	16%	51%	0%
Sub-standard	20%	5%	10%	37%	1%
No service	13%	5%	0%	0%	0%

Table 16: Service levels for control village (n=30)

	Control (n=30)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	10%	67%	83%	0%	93%
Improved	0%	3%	0%	0%	3%
Basic	23%	3%	10%	20%	0%
Sub-standard	30%	10%	7%	80%	3%
No service	37%	17%	0%	0%	0%

As this case study is focused on piped water supply, a comparison was made that only included household connections in both best practice and control villages, detailed tables of which can be found in the Annex. Users with household connections in best practice villages receive significantly better service on the quantity parameter, only 21% receiving unactable quantities, compared to 53% in the control village. The schemes in best practice villages also perform higher on the continuity parameter: 63% of users get acceptable scores there, compared to 24% in the control village. This is because most users in the control village only get water for less than 35 minutes, while the supply duration in best practice villages is mostly 60 minutes or higher.

4.3 Equity

In this section deals with the equity dimension is explored, specifically in regards to caste.

In the surveyed sample, disparities between castes in access to household connections could be observed. As shown in Table 17, 73% of Backwards Caste households have their own connection, compared to 35% of Scheduled Tribes. Whilst 24% of Scheduled Tribes rely on communal sources, this percentage is only 11% for Backwards Castes. An analysis of the quantity parameter comes to similar results. 48% of Scheduled Tribes receive inacceptable quantities, compared to 31% of Backwards Castes. This shows that access to household connections and in service levels is not equitable, with the problems mostly caused by the settlement pattern. Marginalised groups tend to live at the edge of the studied villages and the pipeline often does not reach their hamlets. Giving these groups more consideration in the planning stage could lead to a more equitable system design.

Table 17: Water source by caste

Caste	BC	MBC	OC	SC	ST	Total
Household connection	38	0	3	0	19	**60**
Private well/borehole	8	2	3	2	22	**37**
Public standpost	0	0	0	0	3	**3**
Communal well/handpump	5	0	2	2	10	**19**
Surface	1	0	0	0	0	**1**
Total	**52**	**2**	**8**	**4**	**54**	**120**

4.4 User satisfaction

The survey also asked consumers how satisfied they are with their water supply. As shown in Table 18, less than half of users are very satisfied in all villages. Whilst only very few users are acutely dissatisfied in Bero and Khijiri, more than one third in Rai Bazaar say they are not satisfied with the water supply they receive, a percentage that is higher than in *Brambe*, the control village. Users mostly complain about inadequate pressure and the supply duration, as well as water quality in *Brambe*.

Table 18: User satisfaction with water supply

	Bero	Khijiri	Rai Bazaar	*Brambe*
Very satisfied	43%	43%	20%	37%
Somewhat satisfied	50%	50%	43%	40%
Not satisfied	7%	7%	37%	23%

5 Costing

This section presents the costs associated with the ESE in supporting rural water supply to the CSP. It provides data on both Capital Expenditure (CapEx) on software support and CapEx on hardware. Following this it presents the recurrent support costs. These costs helps in identifying the 'plus' component that supports the sustainable functioning of community managed rural water supply systems in Jharkhand. Costs incurred in the past are adjusted to 2014 prices using the annual average consumer price index calculated by the Reserve Bank of India. Software costs are based on 2014 prices and the number of man days and salaries gathered in key informant interviews at the ESE level.

5.1 Capital Costs

Capital expenditure is categorised into two types: CapEx hardware and CapEx software. Investments in fixed assets, initial construction, system extension, enhancement and augmentation, as well as staff costs for construction supervision come under the CapEx hardware category. CapEx software captures once-off work with stakeholders prior to construction or implementation such as costs for initial capacity building.

Table 19 shows capital expenditure for the four schemes. There was no community contribution to initial construction costs in any of the studied villages. Hardware costs differ widely between the villages due to the relative technical challenges of groundwater versus surface water schemes. For example, the groundwater scheme in Bero consists of an overhead storage tank, a distribution networks and 2 motor pumps, whilst the systems in Khijri and Rai Bazar include large intake structures, filtration plants, overhead storage tanks, distribution networks and numerous motor pumps – 17 in Khijri and 5 in Rai Bazar. Although the scheme in *Brambe* is also a surface water scheme the infrastructure costs are lower because it has a smaller intake structure, a sand filter, a smaller overhead storage tank and only 3 motor pumps. CapEx software was calculated based on the assumption that a part of staff time before and during implementation of the scheme is devoted to mobilising the community and training the VWSC in the operation of the scheme. The ratio of CapEx hardware to CapEx software was found to be range from 1:150 in Bero, the groundwater based scheme, to 1:1500 in Rai Bazaar. This shows the little emphasis DWSD places on community mobilisation and training and its focus on developing physical infrastructure. The BRC mentioned above also receives funding for initial capacity building, however no evidence of this activity and no information on the costs could be obtained.

Table 19: Capital expenditure

Particulars of Costs	Bero	Khijri	Rai Bazar	*Brambe*
Total CapEx hardware	3,368,638	41,483,333	40,435,889	5,342,961
Total CapEx software	23,605	52,685	27,937	27,864
Total CapEx costs	**3,392,243**	**41,536,017**	**40,463,825**	**5,370,825**

5.2 Recurrent costs

Table 20 presents the recurrent costs paid by DWSD. Staff costs were estimated through key informant interviews and the number of staff days of those involved. Direct support is the technical

and administrative assistance given by the Junior and Assistant Engineers, per capita costs for which are similar for all villages.

DWSD plumbers, mechanics, electricians and masons provide support for operation and maintenance in all villages. The service providers' electricity bills are paid by the department and make up the majority of recurring costs.

Chemicals for water treatment are supplied by the department, costs of which are higher in the surface water schemes in Khijri and Rai Bazaar. The committee in Rai Bazaar has not received the matching grant yet, because the scheme is relatively new and has not submitted audited accounts. The expenditure on this O&M support is significantly higher than expenditure on direct support in all villages, with a ratio of 1:4 to 1:7. Indirect support costs were estimated by assuming that 2.5% of the overall budget is used for high-level coordination and policy formulation.

Table 20: Recurrent costs paid by DWSD

	Bero	Khijri	Rai Bazaar	*Brambe*
Staff costs for direct support	101,190	98,409	100,130	62,742
Auditing cost	525	420	700	350
Information and communication materials	2500	2000	3000	1500
Total costs for direct support	**104,215**	**100,829**	**103,830**	**64,592**
Staff costs for O&M support	50,535	62,921	53,094	48,043
Electricity paid by DWSD	252,000	182,400	270,000	204,000
Chemicals provided by DWSD	8,000	30,000	25,000	4,000
Spares and repairs paid by DWSD	0	20,000	0	0
Matching grant	30,000	67,000	0	52,000
Total support for O&M	**340,535**	**362,321**	**348,094**	**308,043**

5.3 Capital maintenance

Data on capital maintenance could only be obtained for two villages. DWSD purchased a new motor for the scheme in Bero at a cost of INR 56,000 in 2013, and paid for repairing a burnt motor in *Brambe* for INR 44,640.

5.4 Overview of costs

As discussed in Chapter 3.5 above, service providers pay their staff salaries with tariffs collected from users, which represents a community contribution towards operating the water supply. Table 21 shows total recurring costs. Overall recurring costs are likely to be significantly higher in Khijri and Rai Bazaar, as information on a major part of the electricity bills paid by DWSD directly could not be obtained. Therefore, these two schemes are not analysed comparatively, as the available costs are likely a significant underestimation.

The tariff collection only covers part of the total reported expenditure on O&M, 16% in Bero and 14% in *Brambe*. This shows the significant financial support VWSCs receive from the department, and the need to increase tariff collection dramatically should the electricity bills paid by them directly. Total

per capita costs are lower in Bero, which might be explained by the larger population and economies of scale and the fact that *Brambe* is a mixed scheme, also using surface water, whilst Bero is a purely groundwater-based scheme.

Table 21: Overview of O&M costs

Particulars of Costs	Bero	Khijri	Rai Bazaar	*Brambe*
Total recurrent costs paid by CSP	70,600	186,000	156,000	48,600
Costs for O&M support	340,535	362,321	348,094	308,043*
Total O&M costs	**411,135**	**548,321**	**504,094**	**356,643**

Table 222 Summary Cost Table (INR)

Jharkhand Summary Cost Table - calculated as the average cost per person, that is averaging across the three 'successful' villages

Source of funds	Use of funds - implementation			Use of funds - annual recurrent					
	CapEx hardware	CapEx software	CAPEX TOTAL	OpEx labour & materials	OpEx power	OpEx bulk water	OpEx enabling support	CapManEx	RECURRENT EXPENDITURE TOTAL
Community/consumers	-	-	-	INR 21	-	-	-	INR 7	INR 28
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	INR 1,815	INR 8	INR 1,823	INR 33	INR 35	-	INR 1	-	INR 69
National Government	INR 1,815	-	INR 1,815	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	-	-	-	-	-	-	-	-	-
TOTALS	INR 3,629	INR 8	INR 3,638	INR 55	INR 35	-	INR 1	INR 7	INR 97
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	100%	100%	100%	61%	100%	-	100%	0%	71%
Median of 20 case studies			95%						57%

Notes: CapManEx is only for the village Bero, as no data could be obtained for the other best practice villages

Table 23 Summary Cost Table (PPP USD$)

Jharkhand Summary Cost Table - calculated as the average cost per person, that is averaging across the three 'successful' villages

Source of funds	Use of funds - implementation			Use of funds - annual recurrent					
	CapEx hardware	CapEx software	CAPEX TOTAL	OpEx labour & materials	OpEx power	OpEx bulk water	OpEx enabling support	CapManEx	RECURRENT EXPENDITURE TOTAL
Community/consumers	-	-	-	$ 1.21	-	-	-	$ 0.41	$ 1.62
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	$ 103.43	$ 0.47	$ 103.90	$ 1.90	$ 1.98	-	$ 0.03	-	$ 3.92
National Government	$ 103.43	-	$ 103.43	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	-	-	-	-	-	-	-	-	-
TOTALS	$ 206.87	$ 0.47	$ 207.34	$ 3.11	$ 1.98	$ -	$ 0.03	$ 0.41	$ 5.54
Median of 20 case studies			$ 184.16						$ 11.78
'Plus' %age	100%	100%	100%	61%	100%	-	100%	0%	71%
Median of 20 case studies			95%						57%

Notes: CapManEx is only for the village Bero, as no data could be obtained for the other best practice villages

The INR Indian Rupee conversion to the USD United States Dollar has been undertaken at the mid 2014 exchange rate of INR60/USD$ with a Purchasing Power Parity (PPP) multiplier of 3.42 applied in order to give the best interpretation of India costs in global terms (http://data.worldbank.org/indicator/PA.NUS.PRVT.PP).

6 Conclusions

This report investigated the support given to community service providers in Jharkhand and how this affected their performance.

The institution responsible for implementing water supply schemes and supporting service providers is the Drinking Water and Sanitation Department (DWSD), Jharkhand. The assessment showed that the department has very qualified technical staff and good leadership. There is room for improvement in community orientation, with staff mostly focusing on technical projects and not on 'soft' skills such as community mobilisation. Regular support to VWSCs is given by monitoring functionality, auditing, water quality testing and technical assistance. The Jal Sahiya, the VWSC president and vice-president receive training from DWSD, although there is no effective mechanism to retrain committee members after they change. In the studied villages quite intensive, but informal, additional support is given to the community service providers. Department engineers provide technical assistance and give advice in running the scheme, whilst DWSD staff such as plumbers or electricians are often called to assist in minor maintenance and repairs. The department pays the entire electricity bills for VWSCs, which are a major part of the overall costs. However, in the future VWSCs should pay the electricity bills themselves and the department has negotiated a 75% discount on the electricity tariff with the Electricity Department, showing effective cooperation with external institutions. Further financial assistance is given in the form of a matched grant in the amount of the total tariff collection, which is transferred to the VWSC after submission of audited accounts. Partnering between DWSD and service providers was found to be mostly of the transactional type, which is common in a government department supporting a large number of service providers.

DWSD partners with an NGO to provide capacity building and ongoing software support in the villages through a Block Resource Centre (BRC). However, no evidence of any activities in regards to water supply could be found in the course of this study; the little support given by BRC is limited to sanitation. Ensuring that BRC fulfils its duties in software support for water supply would lead to a more complete support environment.

Water supply in all four villages is managed by VWSCs. Although the committees are headed by the respective Gram Panchayat president, they act independently from the Gram Panchayat. They have their own bank accounts, to which funds such as the matching grant are transferred directly. This has helped reduce delays and the Gram Panchayat using funds for other purposes. Each VWSC has a 'Jal Sahiya' (water volunteer) who acts as treasurer and conducts water quality testing. The Jal Sahiya is selected from the village's daughters-in-law, ensuring that she stays in the village and does not move away after marriage. In two of the best practice villages, Bero and Khijri, the number of connections have increased significantly since the handover to VWSC in 2011, showing the effectiveness of service provision. The service provider in Bero has effectively reduced the number of defaulters and illegal connections by threatening legal action and waiving all dues older than one year. The VWSC president used his position as Gram Panchayat president to send these letters on the official letterhead and in the name of the Gram Panchayat, which lent additional authority to them. This shows the value of good cooperation between VWSC and Gram Panchayat. The VWSCs showed

relatively high technical performance in the assessment, although they rely heavily on DWSD for spares and assistance in repairing breakdowns.

The type of service provision, according to the model developed by Smits et al. (2015), in best practice cases can be classified as 'community management with direct support' bordering to 'public provision with community involvement'. Although most of the operating costs are paid by DWSD and department staff are involved in day-to-day operation and maintenance, the VWSCs are functioning effectively, involve the community in all decisions and raise enough money through tariff collection to pay their staff. The level of community involvement, as well as professionalisation was found to be lower in *Brambe*, which places this villages a bit below on the graph.

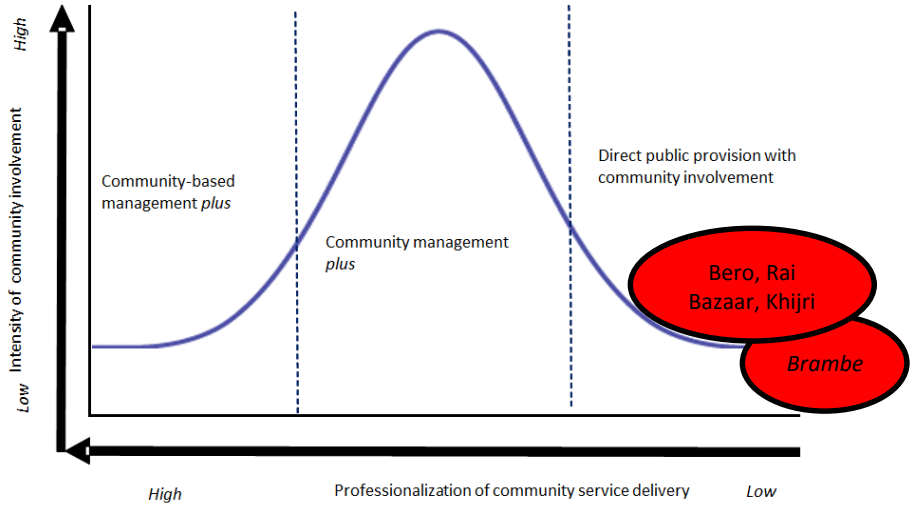


Figure 8: Typology of management for the four service providers

To verify the effectiveness of service provision for users, household surveys were conducted in all four villages and service levels were assessed. Users in best practice villages receive significantly better services than in the control village. However, still about one third of users in best practice villages receive unacceptable quantities and supply durations. Coverage rates with household connections are quite low, at 16% to 42%, and DWSD guidelines forbid the construction of public standposts. Therefore a majority of residents in all villages rely on communal or private wells, handpumps or private boreholes. This, as well as relatively low user satisfaction in Rai Bazaar, shows that this case can only be seen as relative success and there is still room for improvement. The study also found issues in regards to equity. Marginalised groups are less likely to have household connections, and receive lower service levels. This was found to be mostly due to the settlement pattern. Marginalised groups tend to live at the edge of the villages and the water supply system often does not reach their hamlet. Giving these groups more consideration during the planning could lead to a more equitable system design.

Total recurrent support costs were found to be INR 69 per person and year. Of this, INR 35 represent the electricity support for operation and maintenance and INR 33 for general operations support. Costs for initial training and capacity building were estimated at INR 8 per person, which is less than 1% of the costs for initial construction of infrastructure. The service providers pay their staff salaries from tariff collection, which represents about 29% of operating expenses.

This shows that the service is heavily subsidised and the VWSC would have to increase revenue significantly if electricity and all minor maintenance should be paid by the community. This could be achieved by providing more household connections and increasing tariffs.

Overall, these findings suggest that community service providers in Jharkhand, with the current support received from DWSD, are able to provide acceptable service to most consumers. However, connection rates are quite low and due to the absence of public standposts, a majority of residents rely on other water sources, therefore more efforts should be made to increase the number of connections. Service providers would need to increase their revenue dramatically if they should pay for the entire operating expenses, as tariffs currently only cover a small part of it and DWSD is directly subsidising service provision by paying for electricity bills and minor maintenance. In terms of support, community mobilisation and capacity building could be improved, for example through a systematic way of retraining new committee members. All in all, the overall performance can be seen as a good example of relative success, given Jharkhand's history of political instability, the socio-economic situation and the very nascent stage of Panchayati Raj institutions and community management in the State.

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Appendices

Institutional assessment tables

Statement	Agreement
Organisational autonomy	
Sets own organisational policies and goals and changes them as necessary to provide guidance and direction in achieving the objectives of the institution	Disagree (2)
Determines level of funding required to meet organisational goals and secures sufficient funds from appropriate sources	Agree (3)
Conducts such studies as may be necessary and carries out long-term planning to meet the expected demands on the institution; approves and acts on such studies and plans, including appropriate levels of investment to meet future demand	Agree (3)
Determines own organisational structure including roles and responsibilities of major divisions	Strongly Agree (4)
Employs levels of employee compensation, including salaries and benefits, sufficient to attract and retain capable staff	Agree (3)
Average Score	3
Leadership	
Provides clear sense of mission; articulates mission; involves people with the mission so they get a sense of ownership of mission; gets people excited about the mission, believing in it.	Agree (3)
Identifies clear performance standards and is strict but fair; gives positive and negative feedback where due; disciplines where necessary based on performance.	Agree (3)
Maintains sense of balance between future vision and everyday operational matters.	Disagree (2)
Demonstrates personal integrity (i.e., does not claim false overtime, take money, or cut corners for personal gain); instils sense of integrity in others.	Agree (3)
Continuously guides technical staff on need to ensure that levels of technology used by the institution are those which are most suitable in terms of simplicity of operation and maintenance; monitors activities in this regard.	Agree (3)
Average Score	2.8
Management and Administration	
Managers have a clear sense of their own and others' roles and responsibilities. They communicate roles and expectations clearly to others and involve them in the process of defining their roles and responsibilities.	Agree (3)
People are held accountable for getting work done.	Agree (3)

Administrative systems for the following functions have been developed and are regularly used. (Note: rate each system for effectiveness.)	
a. Accounting and Budgeting	Strongly Disagree (1)
b. Personnel	Disagree (2)
c. Management Information	Disagree (2)
Average score	2.2
Community Orientation	
Staff at every level demonstrate that they are oriented toward serving the community / community service provider, and ensure engagement with different groups within community, including the most marginalized; when observed, their decisions and actions are clearly driven by what is best for the community.	Agree (3)
There are identifiable mechanisms for communities / community service providers to interact with key areas of the institution over important matters (e.g., call-down for technical assistance, bill disputes, service problems), that are also accessible to the most marginalized groups within the community.	Agree (3)
There is clear evidence that the institution responds to complaints, emergencies, and suggestions which community members / community service providers make.	Disagree (2)
There are identifiable, ongoing, and effective measures to educate communities / community service providers about institutional services and requirements.	Strongly Disagree (1)
The institution makes efforts to invite and evoke an effective level of community / community service providers participation (e.g., mechanisms for communities to bring concerns/complaints to the institutions).	Agree (3)
Average score	2.4
Technical Capability	
Consistently makes sound technical decisions and effectively serves management by conducting technical studies and planning as requested.	Agree (3)
Ensures effective control of the quality of the end product and all other technical operations.	Disagree (2)
Uses or adapts technology which is suitable for the specific needs of the institution and avoids temptation to use more exciting-but not appropriate-technologies learned by staff who were trained in other settings.	Agree (3)
Maintains levels of in-house technical skills adequate for routine technical responsibilities and sub-contracts to outside specialists those tasks which are either beyond the institution's own capabilities or necessary to meet peak needs.	Agree (3)
Conducts practical research and experiments to improve existing uses of technology for local conditions and needs.	Agree (3)
Average score	2.8

Developing and Maintaining Staff	
A clear process for determining skill needs exists and is the basis for designing training programmes.	Disagree (2)
A system exists for developing competent managers and supervisors.	Disagree (2)
The institution provides adequate incentives to maintain staff (i.e. salary levels, employee, benefits)	Agree (3)
A clear system exists for hiring qualified personnel and firing or disciplining personnel when necessary.	Disagree (2)
A career path is open to social/community development staff and technical staff and management staff.	Disagree (2)
Average score	2.2
Organizational Culture	
An observable team spirit exists among the staff.	Disagree (2)
People express a sense of ownership and pride about working that is communicated by such statements as "this is a good place to work."	Agree (3)
Employees are able to articulate the history and legends of the organization in positive ways.	Strongly Disagree (1)
Continuity in the organizational culture is maintained (even with staff turnover at high or low organizational levels).	Strongly Disagree (1)
Staff place a value on maintaining the organisations physical infrastructure (offices, treatment plants, grounds) of the organization. Facilities look clean, well maintained, and attractive.	Agree (3)
Average score	2
Interactions with Key External Institutions	
Top management stays well informed about external policy, financial, and regulatory issues and actions.	Agree (3)
Management maintains direct contact with the key individuals in all important external entities.	Agree (3)
Specific strategies are formulated to influence policies, legislation, and other activities to obtain necessary approvals and resources.	Agree (3)
Programmes are developed to influence the public in support of institutional goals.	Disagree (2)
To the extent to which it is not already responsible/involved in services, local government/Panchayati Raj is kept full informed and involved in the process of support and monitoring	Strongly Agree (4)
Average score	3

Partnership assessment tables

Capital Investment (implementation)	Statement	Agreement
A. Collaborative	ESE and CSP share responsibility for decisions regarding hardware (e.g. infrastructure) and software (e.g. capacity building) development during implementation	Disagree (2)
B. Contributory	ESE and CSP pool financial resources to meet the costs of capital investment in hardware and software provision during implementation	Strongly Disagree (1)
C. Operational	ESE and CSP work together contribuing labour and/or resources to deliver hardware and software provision during implementation	Disagree (2)
D. Consultative	ESE and CSP communicate regularly during implmentation with structured opportunties for feedback and dialogue	Agree (3)
E. Transactional	ESE and CSP initially negoitate a implementation plan that is then delivered by the ESE	Strongly Agree (4)
F. Bureaucratic	ESE provides CSP with a standardised model of hardware and software provision during implementation	Strongly Agree (4)
On-going service delivery	**Statement**	Agreement
A. Collaborative	ESE and CSP share responsibility for decisions regarding administration, management and operation and maintenance	Agree (3)
B. Contributory	ESE and CSP pool financial resources to cover costs of administration, management, and operation and maintenance	Strongly Agree (4)
C. Operational	ESE and CSP work together contributing labour and/or resources to support administration, management, operation and maintenance	Agree (3)
D. Consultative	The ESE and CSP have a systematic and transparent system for sharing information regarding administration, management, and operation and maintenance	Disagree (2)
E. Transactional	The ESE and CSP fulfill different elements of the administration, management, and operation and maintenance functions as per negoitated arrangements	Agree (3)
F. Bureaucratic	Bureaucratic standards dictate the system for administration, management, and operation and maintenance	Strongly Disagree (1)

Asset Renewal	Statement	Agreement
A. Collaborative	ESE and CSP share responsibility for decision making regarding asset renewal	Disagree (2)
B. Contributory	ESE and CSP save and pool financial resources to meet the costs of asset renewal	Agree (3)
C. Operational	ESE and service provider contribute labour and/or resources for asset renewal	Agree (3)
D. Consultative	ESE and CSP systematically share information regarding service levels and technology status enabling proper planning for asset renewal	Disagree (2)
E. Transactional	Asset renewal is dependent on ngeoitations between ESE and CSP following a request from the CSP	Strongly Agree (4)
F. Bureaucratic	Asset renewal is dependent on generic programme timelines (i.e. every X years)	Strongly Disagree (1)
Service Enhancement or Expansion	**Statement**	Agreement
A. Collaborative	ESE and CSP share responsibility for decisions regarding service enhancement or expansion	Disagree (2)
B. Contributory	ESE and CSP save and pool financial resources to meet the costs of service enhancement or expansion	Agree (3)
C. Operational	ESE and CSP contribute labour and/or resources for service enhancement or expansion	Agree (3)
D. Consultative	Information regarding service levels, technology status and population is systematically shared, enabling proper planning for service enhancement or expansion	Disagree (2)
E. Transactional	Service enhancement or expansion is dependent on ngeoitations between ESE and CSP following a request from the CSP	Strongly Agree (4)
F. Bureaucratic	Planned asset replacement, expansion or renewal is dependent on generic programme timelines (e.g. every X years and/or with every X% of population increase)	Strongly Disagree (1)

Service level tables

Table 24: Service levels for household connections in practice villages (n=43)

	Household connections in best practice (n=43)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	28%	100%	65%	2%	98%
Improved	19%	0%	0%	9%	2%
Basic	33%	0%	19%	51%	0%
Sub-standard	16%	0%	16%	37%	0%
No service	5%	0%	0%	0%	0%

Table 25: Service levels for household connections in control village (n=17)

	Household connections in control (n=17)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	18%	100%	76%	0%	100%
Improved	0%	0%	0%	0%	0%
Basic	29%	0%	12%	24%	0%
Sub-standard	18%	0%	12%	76%	0%
No service	35%	0%	0%	0%	0%

Table 26: Service levels in Bero village (n=30)

	Bero (n=30)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	13%	97%	100%	0%	100%
Improved	3%	0%	0%	0%	0%
Basic	53%	0%	0%	0%	0%
Sub-standard	23%	3%	0%	100%	0%
No service	7%	0%	0%	0%	0%

Table 267: Service levels in Khijiri village (n=30)

	Khijiri (n=30)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	50%	81%	53%	0%	93%
Improved	3%	7%	0%	0%	3%
Basic	7%	4%	23%	100%	0%
Sub-standard	17%	7%	23%	0%	3%
No service	23%	0%	0%	0%	0%

Table 278: Service levels in Rai Bazaar village (n=30)

	Rai Bazaar (n=30)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	13%	83%	70%	5%	100%
Improved	20%	0%	0%	18%	0%
Basic	37%	0%	23%	59%	0%
Sub-standard	20%	3%	7%	18%	0%
No service	10%	13%	0%	0%	0%

Table 289: Service levels in *Brambe* village (n=30)

	Brambe (n=30)				
	Quantity	Accessibility	Quality	Continuity	Reliability
High	10%	67%	83%	0%	93%
Improved	0%	3%	0%	0%	3%
Basic	23%	3%	10%	20%	0%
Sub-standard	30%	10%	7%	80%	3%
No service	37%	17%	0%	0%	0%