COMMUNITY MANAGEMENT OF RURAL WATER SUPPLY

Community Water *plus*

Malaviya National Institute of Technology, Jaipur

Understanding the resource implications of the 'plus' in community management of rural water supply systems in India: 24x7 water supply in Punjab - international funding for local action

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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

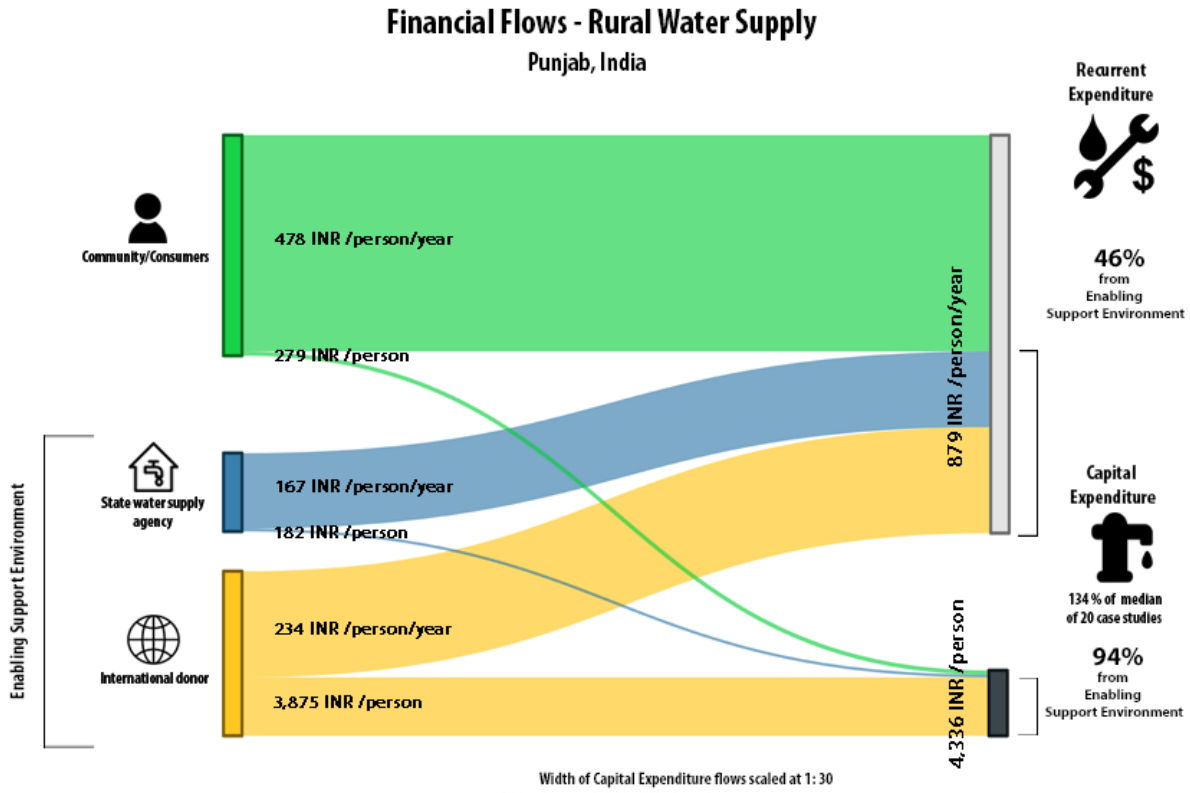
Rural water supply in Punjab has undergone a substantial change due to the World Bank funded Punjab Rural Water Supply and Sanitation project. Service levels been improved markedly in the successful villages studied – to 24x7 supply – with communities taking full ownership and responsibility. During this process the local government department (DWSS) has begun a systematic process of change, which will see it move from an engineering body, focused on building infrastructure, to one committed to service delivery.

- **The project invested in high quality infrastructure, with an excellent service from the very start:** people are more willing to pay when they see a transformative change in the service they receive. By ensuring that the infrastructure was of the best quality, it not only helps ensure service delivery into the future – for example mitigating reduced groundwater levels – but provides a service people feel is aspirational.
- **There is a high level of transparency and accountability with the water committees:** each village studied had comprehensive records, and a commitment to sharing this information: such as 'transparency boards' located outside the pump-house. When users know where their tariffs are going, they are less likely to question if the money is being spent appropriately, and more likely to pay willingly.
- **The programme has been statewide:** from the outset this project was seen as part of a Sector Wide Approach (SWAp) to rural water supply. This change has required considerable political leadership, but the scale generated by the SWAp has been essential. This has allowed a systematic IEC programme to be implemented, and in particular the development of 'role model' villages to inspire others, now reportedly reaching over 500 villages.

Punjab 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 279	-	INR 279	INR 107	INR 267	-	-	INR 103	INR 478
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	INR 139	INR 43	INR 182	INR 1	-	-	INR 166	-	INR 167
National Government	-	-	-	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	INR 3,745	INR 130	INR 3,875	-	-	-	INR 32	INR 202	INR 234
TOTALS	INR 4,164	INR 173	INR 4,336	INR 108	INR 267	-	INR 198	INR 306	INR 879
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	93%	100%	94%	1%	0%	-	100%	66%	46%
Median of 20 case studies			95%						57%

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.


Financial Flows - Rural Water Supply
Punjab, India
Recurrent Expenditure
Community/Consumers
478 INR /person/year
279 INR /person
46%
from Enabling Support Environment
879 INR /person/year
Capital Expenditure
State water supply agency
167 INR /person/year
182 INR /person
134 % of median of 20 case studies
Enabling Support Environment
International donor
234 INR /person/year
3,875 INR /person
94%
from Enabling Support Environment
4,336 INR /person
Width of Capital Expenditure flows scaled at 1: 30

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Appreciation and gratitude is also extended to the residents of Singhpura, Sharpur, Ghataur and Daumajra villages in SAS Nagar District, Punjab for their patience in answering our many questions and surveys. Thanks is also due to the numerous staff of Punjab DWSS, particularly Mr Daljit Singh, whose assistance in collating information and providing costing data has been invaluable.

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.

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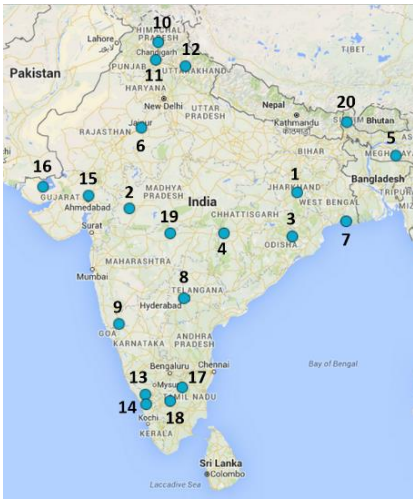

The twenty case studies

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

The twenty 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.

Contents

Executive summary 1
Acknowledgements 3
1 Introduction 6
1.1 Background to the topic and the Community Water plus project 6
1.2 Overall objectives of the research and research questions 6
1.3 Concepts and methodology 7
1.3.1 Case study selection 8
1.3.2 Data collection and analysis 9
2 Context: water supply in Punjab 10
3 Enabling Support Environment Level 11
3.1 Background and origin of the ESE, and context in which it operates 11
3.2 Enabling support environment description 11
3.3 Enabling support environment performance indicators and institutional assessment 14
3.4 Enabling support environment partnering assessment 16
4 Community Service Provider Level 18
4.1 Context 18
4.1.1 Infrastructure snapshot 18
4.2 Community service provider descriptors 19
4.2.1 Composition of the GPWSC 19
4.2.2 Financial accountability 20
4.2.3 Staffing 20
4.2.4 Community Service Provider/GPWSC Focus Group 20
4.3 Community service provider indicators 21
4.4 Community service provider participation assessment 22
4.5 Community Service Provider Costs 22
5 Household Service Levels 24
5.1 Coverage 24
5.2 Quantity, Accessibility, Quality, Continuity, Reliability 25
5.2.1 Singhpura and Ghataur 25
5.2.2 Shahpur and *Daumajra* 25
5.3 Storage and Equity 26
5.4 Community and household views 27

6 Costing 29
6.1 Capital costs 29
6.2 Recurrent costs & revenue – Opex, hardware & software 30
6.3 Capital maintenance costs – hardware and software 32
6.4 Capital maintenance reserves 32
7 Conclusions 35
8 Appendices 37
8.1 Appendix 1 – Organograms for PRWSS project 37
8.2 Appendix 2 – Detailed activity-responsibility matrix 0

1 Introduction

Rural water supply in Punjab has traditionally been provided by the state government. Villages were served by a mixture of handpumps, multi-village piped schemes and traditional sources – all of which delivered a less than satisfactory service. In response to this situation, and reflecting the increasing desire of the Government of India to delegate responsibility for water (and other service to villages), in 2006 the Government of Punjab embarked on a INR 985 crore World Bank funded project to transform rural water. This would see high quality infrastructure being built, with the potential for 24x7 piped supplies, and being handed over to communities to own, operate and manage, with Some support from the Department for Water Supply and Sanitation. By the end of the project in December 2014, supplies had been improved in 1,452 villages, of which 521 were seen as 'exemplary' – meeting 14 criteria related to service provision and operation. Across the scheme, 74% of villages fully meet the costs of operation and maintenance. This is remarkable for community managed water supplies, and the success of the scheme can hold valuable lessons for similar projects.

1.1 Background to the topic and the Community Water plus project

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.

1.2 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 piped water schemes in SAS Nagar District, Punjab. In this case study a significant World Bank funded project has seen new infrastructure created, and handed over to Village Water & Sanitation Committees (VWSC) for management and operation. All of the schemes studied are single village schemes with a borehole, service reservoir and distribution network with household connections. On-going support is provided by the existing Punjab Department of Water Supply and Sanitation (DWSS) in the form of the local Junior Engineer who provides technical and accountability support.

1.3 Concepts and methodology

Community Water *plus* (community management of rural water supply systems) is a research project that aims to gain insights into the type and level of support and professionalisation that is needed, and the resource implications of this 'plus' (in terms of money, staffing, and other factors), in order to achieve sustainable community management. To achieve this, the research investigates twenty case studies of 'successful' (as initially reported) community-managed rural water schemes across India where the range of States, and their varying socio-economic as well as hydrological conditions, gives a good sample of technologies and approaches which are of relevance to many lower-income countries. Ultimately, the hypothesis underpinning the research is that some level of external support is needed to deliver on-going high quality water services through a community management model. Key to this support is what this research labels the 'enabling support environment' (ESE) that fulfils both 'service authority and monitoring' functions, such as planning, coordination, regulation, monitoring and oversight, and 'direct support' functions, such as technical assistance and financial contributions (Lockwood and Smits, 2011).

The research focuses on the level of water service people receive so as to validate the degree of success found under the different programmes. The way in which the community are involved in delivering this service is considered through what the study terms the 'community service provider' (CSP), which is the entity that takes on the responsibility for everyday operation and minor maintenance of the water supply service. It is recognised that an effective CSP should reflect both the local community and the complexity of the water system, leading to divergent models of management and participation. However, firstly we investigate the form, function and resource implications of the ESE, along with an analysis of the strengths and weaknesses of this particular model. The study finishes with a detailed consideration of the total cost of providing water services, with a focus on the costs incurred by the ESE – whether directly or indirectly.

Figure 2-1 provides an overview of the different elements, whilst a detailed research methodology and explanation of the underlying has previously been published as part of the Community Water*plus*

project: "Understanding the resource implications of the 'plus' in community management of rural water supply systems in India: concepts and research methodology", Smits, S., Franceys, R., Mekala, S. and Hutchings P., 2015. Community Water Plus working paper. Cranfield University and IRC: The Netherlands; please see http://www.ircwash.org/projects/india-community-water-plus-project

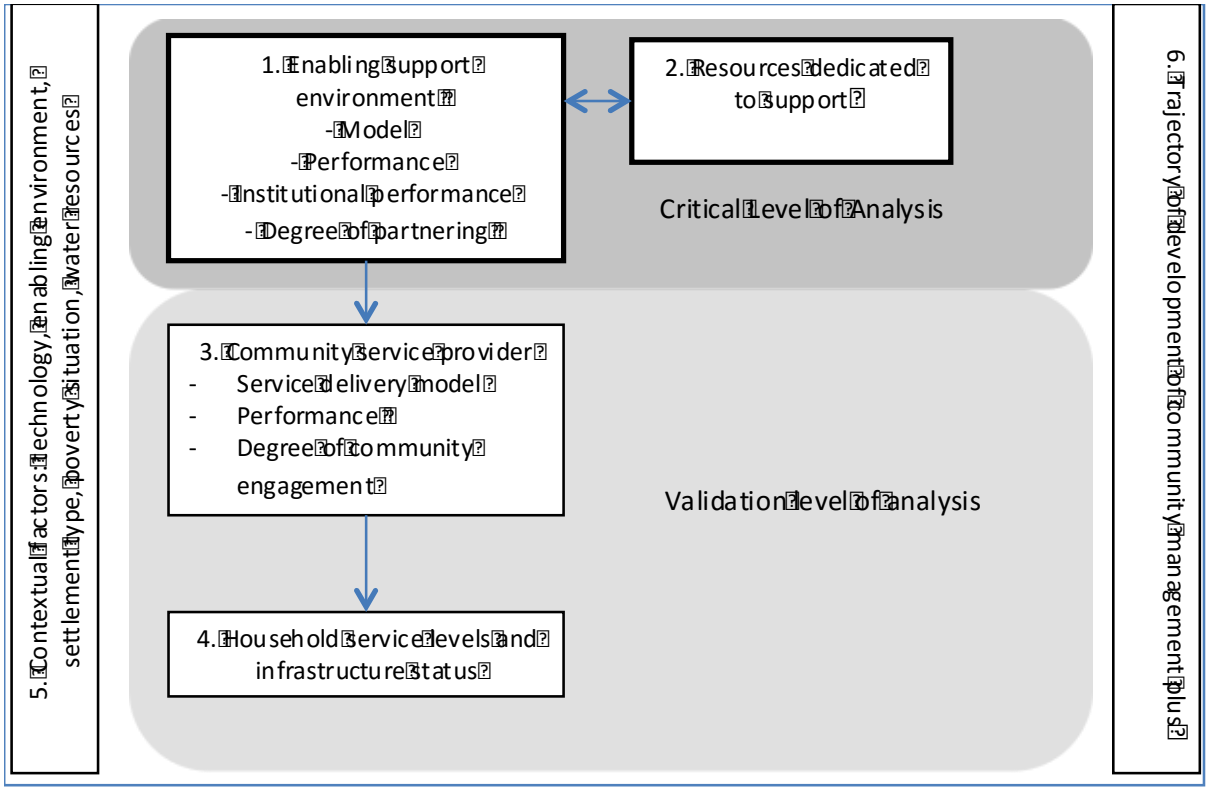

Figure 1-1 Relationship between the research elements

1.3.1 Case study selection

This case has been selected because between 2006 and 2014 the World Bank funded PRWSS project marked the start of a state wide drive to supply all 15,000 villages across Punjab with 70lcpd of water, with communities taking responsibility for construction, operation and maintenance of the systems. The project also sought to make the systems financially sustainable, with operation and maintenance charges being recovered through user tariffs. The PRWSS project reached over 1400 villages, with the remainder to be served under a similar mechanism but with different funding sources. The project received widespread publicity in part because it was an attempt to implement a consistent sector wide approach (SWAp) across an entire states water supply system. This contrasts with many community managed schemes, which focus on specific areas. The project was also unusual in the scope of it's ambition: aiming to implement water metering and 24x7 supply across many of the villages served. Evidence, both anecdotal and from quantitative project outcomes, appeared to point to a strongly successful scheme.

Through discussions with the DWSS it was decided to focus on villages in SAS Nagar district, in part as these were seen as functioning at a very high level, in part due to excellent support from the field staff of the DWSS. Three best practice villages (Singhpura, Sharpur and Ghataur) were chosen as exemplary

villages. The control village (Daumajra) was chosen because despite receiving the same support it was identified as encountering some problems in the functioning of the VWSC.

1.3.2 Data collection and analysis

In order to have information, on each of the research elements, this case study carried out data collection during field visits in November 2014 with a follow-up visit made in June 2015. This data was complemented by a literature review and data available on the DWSS and World Bank websites. In total, 8 key informant interviews, 4 focus groups and 120 household surveys were collected as well as material from secondary sources (such as organisational reports).

Unit of analysis	Data collection methods
Enabling support environment	8 Key informant interviews (three of the informants interviewed more than once)
Community service providers	4 focus group discussions (one in each village) (Held twice, second time for Ben's benefit)
Households	120 Household surveys (30 in each village) and 4 focus group discussions (one in each village)
Resource dedication	Review of literature available on World Bank and Punjab Water Supply Department website (i.e. Programme/Project documents) Compilation of operating expenditure from: VWSC accounts books

The data were processed in 4 databases (one for each of the units of analysis). These databases contain scoring tables for the performance of the enabling support entities, the service providers, 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)). Though the scores obtained have informed much of the analysis presented here, these analyses were refined through validation meetings with CEC staff.

In the costing section, all prices quoted are given in Indian Rupees (Rs) and have been given in actual prices at time of implementation unless stated otherwise.

For more information on the conceptual framework and research methodology please see Community Water *plus* Concepts and Research Methods (2015).

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2 Context: water supply in Punjab

Punjab is a prosperous state in north-west India. It has one of the highest GDP per capita (INR 99,578 in 2014-15 [REF http://data.worldbank.org/indicator/PA.NUS.PRVT.PP] amongst Indian states and only 7.7% of the rural population exist below the poverty line [REF planning commission] compared to a national average of 25.7%. The economy of the state is dominated by agriculture, with the land being particularly fertile - Punjab is known as the breadbasket of India. There is a long history of irrigating the land for agricultural use, with many landowners having private boreholes for this purpose. This means there is an extensive pool of people who have some knowledge of operating and maintaining simple pumping and distribution systems. Punjab is also one of the largest recipients of remittances from Non-Resident Indians of all states [REF?], and Punjabis have a reputation for being prudent with money and pragmatic in their business.

The government has made extensive investment in water supply to the point where, as of 2015, 87.6% of habitations are served by a piper water supply. The all India average is only 40.3%. With limited surface water much of the state traditionally depends on groundwater resources, but due to extensive use for drinking water and irrigation many shallow aquifers are over-exploited [REF CGWB]. Additional groundwater resources are available in deep aquifers.

Figure 2-1 SAS Nagar District

Figure 2-2 Location of villages studied

The villages in this case study are all located in SAS Nagar District, in Majri and Kharar blocks. All villages are located in a corridor which runs either side of the main road between Kurali, a small but growing town and Chandigarh. Chandigarh is the state capital of both Punjab and Haryana, whilst also being a Union Territory. In part due to the high concentration of government employees it is one of the wealthiest areas in India with a GDP per capita of INR 140,000 – over double the Indian average. The majority of the population are employed in agriculture and associated industries, though there is a growing industrial base in Kurali, and there are numerous technical education institutes in the district. The proximity of prosperous and growing areas has a significant influence on the villages studied.

3 Enabling Support Environment Level

This section provides information on the enabling support environment that exists in the villages studied. In this case study the support environment is relatively simple: all support is directed through the Punjab Department of Water Supply and Sanitation (DWSS) which has a legal duty to provide drinking water in rural areas (though not urban areas). Although, as will be shown, the funding for this particular project was more complex there is clear responsibility for providing water services and the support communities need.

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

The DWSS was created as recently as 2004 when the previous Department of Public Health was reorganised and renamed. However it's roots stretch back to 1956, when it was created as a Public Health Engineering Branch of the Public Works Department (the functions of the branch were previously managed under the Building and Roads Branch). The first body dedicated to water and sanitation was created in 1977 as the Punjab Water Supply and Sewerage Board.

Throughout this slightly convoluted history, the DWSS (and is predecessor bodies) has had a formal mandate with "responsibility of providing safe drinking water to the Rural Population" [REF DWSS website]. An organisation predominantly staffed by engineers, this has traditionally been achieved in a top-down manner with limited community involvement. In 2006, despite earlier Government of India community focused schemes such as Swajaldhara, the World Bank proposal document reported that "The DWSS accountability and incentive structures favour new construction with little concern for the quality of service. The new schemes are planned and built with limited or no participation of the end users in decision making or service management." At the start of the PRWSS project only 308 Gram Panchyats (out of 11,773 across the state) were managing their water supplies.

Starting in 2006, the PRWSS project was a major World Bank funded project to extend high quality (70 lpcd) water services to the majority of villages in rural Punjab. This represented a significant change in the working methods of the DWSS: a separate project cell was established, and communities become central to the planning and implementation of water systems. The role of engineering staff shifted from managing infrastructure to supporting communities. Despite the scale of the PRWSS programme, and the intention of implementing a Sector Wide Approach (SWAp), there are still many rural habitations which continue under the pre-existing arrangements. For the purposes of this case study, only the role of the DWSS in the PRWSS villages is considered.

3.2 Enabling support environment description

To implement the PRWRSS project, the DWSS created a new project cell at state and district level which had responsibility for managing the project and overseeing change within the DWSS. Responsibility for implementing the water supply systems (in conjunction with the GPWSCs) rested with the existing operations wing of the DWSS – that is the familiar structure of Junior, Assistant and Executive Engineers. A summary of the responsibilities is given in Figure 3-1, and a full organogram in Appendix 1 – Organograms for PRWSS project.

Main Function	Responsible Institution
Policy, Annual Plans and budget approvals	State Water and Sanitation Mission (SWSM) and District Water and Sanitation Committees (DWSC)
Leading and managing the reform process and outcome monitoring	DWSS Program management wing : State Program Management Cell (SPMC) and District Program Management Cells (DPMC)
Implementation and service delivery	DWSS Operations wing (ie. regular Circles/divisions/ sub divns) and Gram Panchayat Water and Sanitation Committee

Figure 3-1 Allocation of responsibilities to various bodies in PRWSS project

The state and district level bodies may not interact directly with communities, but form an essential backbone to the ESE: setting the ethos of the institution and providing strong leadership. This is essential when, in order to provide appropriate support, the organisation has to undergo significant change. It has been suggested that there was significant opposition to the shift to community management from both engineering staff in the DWSS and local politicians, who believed that providing water was the sole responsibility of the state. However, strong political leadership from the principal secretary, and even the Chief Minister of Punjab, were essential in overcoming this.

The project cells (at various levels) were key to driving through the PRWSS project, particularly those activities that were not part of the DWSS's traditional strength such as Information, Education and Communications(IEC) and community mobilization. There was a significant investment in IEC activity, and a focus on this before any infrastructure was created. For example, before any other work, water quality testing was undertaken to show to villagers that existing sources were poor. Only when the need for a new water system was accepted was there any work to form a GPWSC and a undertake further IEC activity.

This IEC activity included a series of village meetings, street dramas and publicity materials such as radio jingles. As well as raising awareness of the programme, the aim was to engage with communities and to build their capacity to manage systems. However, it was felt that the most effective tool was various peer-mechanisms – such as a high number of exposure visits to villages that had been developed as role models. Using villages that had already benefited from new infrastructure and were functioning appears to be a successful way of both illustrating what is possible and motivating communities to emulate this. It is also useful to note that the management structure had a line of responsibility for IEC to the DWSS secretary, which ensured that this activity was taken seriously and not treated as a secondary activity.

The central programme cell was also responsible for the implementation of a centralised complaint system, which is available to all water users. The system allows customers to register complaints through a toll-free number, and automatically alerts the responsible DWSS official via text message. If no action is taken, the complaint is followed up, with escalation processes in place if field-level officials do not respond. A complaint can only be marked as complete, when the original complainant is satisfied that it has been dealt with. In the first four years of operation the system dealt with 39,196 complaints, of which 99.01% had been successfully dealt with. The system not only allows users a clear and responsive complaint mechanism, but gives the DWSS quantifiable information on where problems are occurring, to help identify any unwelcome trends.

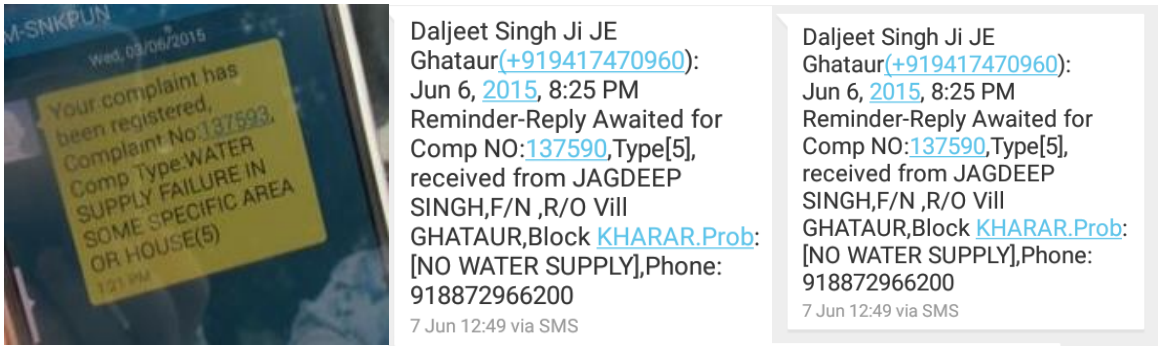


Figure 3-2 Automated complaint system showing (L-R) complainants confirmation, notification to JE, reminder to JE

Much of the support to villages comes at the lowest levels, and the operation wing of the DWSS, particularly from the Junior Engineer (JE). This includes (but is not limited to):

- the JE is the technical member of the GPWSC and attends all meetings, taking a full role in discussions involving the operation and maintenance of the system;
- the JE is a third signatory on the bank account, so expenditure cannot take place without their approval;
- the JE is on hand to offer technical advice to the pump-operator when making repairs, and provide 'on the job' training;
- the DWSS prepared the specifications for the infrastructure, and signed off on final completion that the work was satisfactory (although GPWSCs were responsible for hiring and paying contractors);
- the DWSS conducts regular water quality testing;
- assistant and executive engineers pay regular monitoring visits to the villages.

The support is relatively intensive (estimated at 40 staff-days per year, per village) but from experience appears to be non-intrusive. The GPWSCs still have a high level of autonomy and the final say on any decisions. However, the support is still very informal in many ways: although the DWSS has broad requirements of its staff (such as attending meetings) the actual support offered appears to depend on the needs of the GPWSC, with little in the way of pre-defined tools. For example, in SInghpura the JE has started a water audit to help the GPWSC identify exactly where water loss is occurring. In a separate village, as part of the move to a 24x7 supply, the DWSS facilitated removal of booster pumps from those households using them. This type of support obviously relies heavily on the individual officers.

Table 3-1 presents an overview of the activities undertaken by the DWSS, whilst a full activity-responsibility matric is provided in Appendix 2 – Detailed activity-responsibility matrix.

Table 3-1 Activities undertaken by DWSS

Type of activity	Is this type of activity undertaken by the ESE?	Way of providing support	Modality of support	Explanations and comments
Monitoring and control (auditing)	Yes	Directly to service provider	Both (On request and supply based)	DWSS monitors individual GPWSC, albeit informally. JE Audits accounts.
Water quality testing	Yes	Directly to service provider	Supply based	DWSS regularly tests water samples
Water resources management	No	N/A	N/A	There is no water resource management on a village level.
Technical assistance	Yes	Directly to service provider	Both (On request and supply based)	JE provides techncial advice and support to GPWSCs
Conflict Management	Yes	Directly to service provider	On request	DWSS steps in when issues arise, but only in a reactive manner.
Support in identifying investments needs	Yes	Directly to service provider	Both (On request and supply based)	JE is on hand to provide advice for purchase of new equipment etc. Not clear if this only when advice sought, or proactive
(Re)training of service provider	Yes	Directly to service provider	Both (On request and supply based)	On-going training using other villages to train new operators. No formal on-going training
IEC activities	Yes	Both (directly to service provider and via an intermediary)	Supply based	PRWSS IEC cell was active thorughout project, but has now been subsumed into broader DWSS. Some support organisations (including NGOs) were contracted to deliver this initial IEC.
Fund mobilization	Yes	Directly to service provider	On request	DWSS only provided fund mobilization at start of project. No on-going funding.

3.3 Enabling support environment performance indicators and institutional assessment

A detailed institutional assessment was conducted of the DWSS by scoring it against various statements under eight broad themes as seen in the CW+ Research Protocol. This assessment is, by its nature subjective, but allows some analysis of the institutions strengths and weaknesses. As expected the DWSS performs strongest in technical capability – largely due to the large number of qualified engineers employed. What is perhaps more interesting is the number of areas where it performs adequately, if not exceptionally. Areas like community orientation and organisational autonomy are

not normally where would you expect a state department to perform strongly. But, as evidenced by the very existence of the PRWSS programme, the DWSS is capable of shaping it's own response to policy objectives, and even going outside traditional funding streams to secure the funds needed to do this.

It is the experience of the research team that key to this is the leadership of the DWSS. This, along with political leadership, has been key in pushing through the reform agenda in the face of opposition from both politicians and some DWSS staff, who were strongly of the opinion that water should be the preserve of the state, with no space for community management. The day-to-day management of the DWSS does not score so highly, in part because of a lack of a comprehensive MIS, and limited systematic monitoring of community service providers.

Links with external institutions appear to be strong at all levels. There are encouraging anecdotes – such as the informal agreement between the DWSS and electricity board that no GPWSC will be cut off for being in arrears with electricity bills. This has allowed the DWSS to work with GPWSCs struggling financially without affecting services – in one example turning a INR 8,00,000 backlog into a health INR 1,50,000 reserve.

The DWSS scored highly on statements of organisational culture (as evidenced by the on-going cultural change), but at the same time the weakest area appears to be in developing staff – the internal structure is still heavily hierarchal, and there is limited scope for progression of non-technical staff.

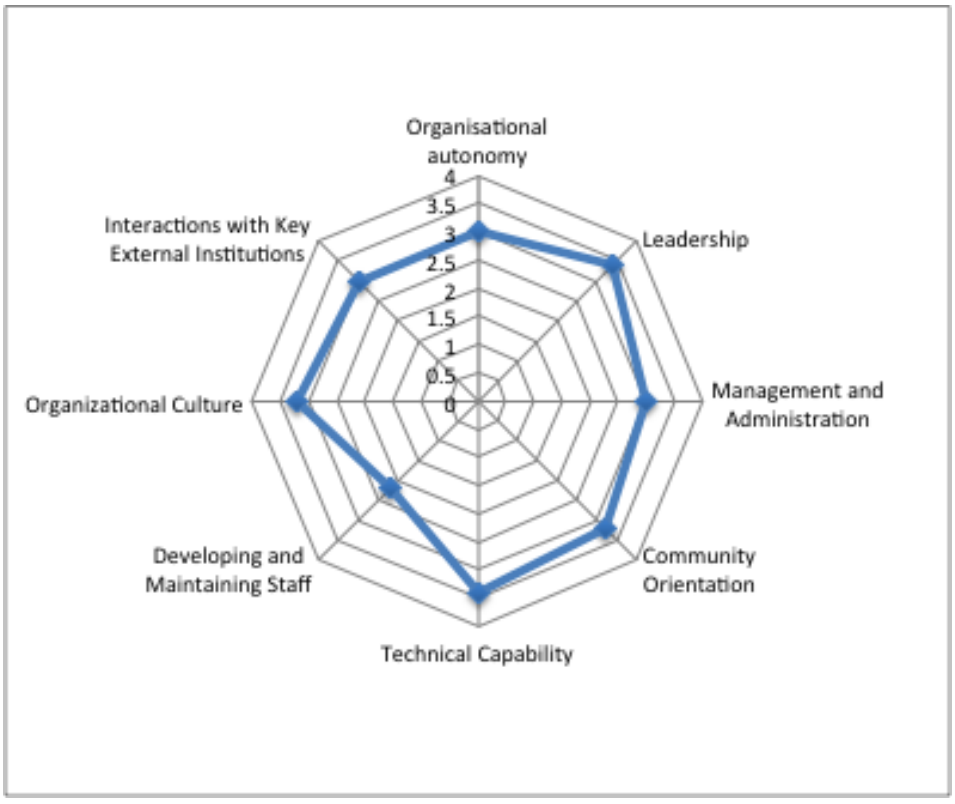


Figure 3-3 Institutional assessment for Punjab DWSS

3.4 Enabling support environment partnering assessment

This section attempts to classify the nature of the partnerships between the ESE and CSPs. This was done by matching the observed partnering arrangements with seven definitions of partnering typologies defined in the research project concepts.

Although the DWSS works closely with the GPWSCs the nature of this partnership varies at different stages of project delivery, as highlighted below in Table 3-2. It should be noted that for on-going work, the partnering assessment is based heavily on the research team's observations in the villages studied, and may not hold true for all villages in the PRWSS project.

Table 3-2 Partnering assessment for Punjab DWSS

Stage	Type of partnering	Description	Justification
Capital Investment	Collaborative	ESE and CSP share responsibility for decisions regarding hardware (e.g. infrastructure) and software (e.g. capacity building) development during implementation	It is difficult to classify this stage: it is clearly collaborative as the GPWSC plays a full role in working with the DWSS to plan the system, and must fully buy in to the programme before work can progress. However, although the GPWSC is also in charge of implementation, this is clearly done to a standard set of designs from the DWSS. In addition the capacity building element was developed centrally by the DWSS. This makes it at least partly
	Bureaucratic	ESE provides CSP with a standardised model of hardware and software provision during implementation	
On-going service delivery	Consultative	The ESE and CSP have a systematic and transparent system for sharing information regarding administration, management, and operation and maintenance	Although the GPWSC have responsibility for service delivery, this is done in consultation and with support from the DWSS in the form of the JEn. The Jen has an effective veto on spending decisions by being one of three signatories to the bank account.
Asset Renewal	Collaborative	ESE and CSP share responsibility for decision making regarding asset renewal	Due to the recent construction of the systems there has been no need for asset renewal. However, some GPWSCs have begun to prepare for this through the purchase of back-up pump motors. Here the the DWSS has provided technical advice to the GPWSC which made the final decision, and financed the purchase. It is not clear to what extent the DWSS would fund major asset renewal. Whilst many of the GPWSCs have

Stage	Type of partnering	Description	Justification
			strong reserves, this would not cover full asset renewal.
Service Enhancement or Expansion	Consultative	Information regarding service levels, technology status and population is systematically shared, enabling proper planning for service enhancement or expansion	There has only been limited enhancement to date (such as the move to 24x7 provision and the installation of meters), but this has seen the DWSS provide technical advice to the GPWSC who make the final decision, and financing theenhancement.

Mr Daljit Singh (right in the photo, giving a water bill) has been working for the DWSS for over 20 years as a member of the engineering staff. He is the Junior Engineer responsible for the villages in this case study, a job has he has now been doing for 8 years – building up links with the communities who rely on the water he helps to deliver. He's also a resident of Ghataur village, where his wife volunteers to act as the accountant. A case of sitting on both sides of the fence.

A criticism of community management has been that success is often linked to key charismatic individuals: is that the case here? In numerous meetings with communities and senior DWSS staff, they made clear that the outstanding success in these villages was due in no small part to his efforts and commitment. Being a part of the community obviously helps too: a deep rooted commitment to helping local people and an understanding of cultural and political issues which may arise. An understanding which may be lacking when staff are from outside the area, and moved between posts frequently.

As for Mr Singh: he admits that working with communities this way can be hard. In the initial stages he had to do much more work to help mobilise the community and train staff on the management and operation of the systems. But now that the systems are managed in a stable way, there is much less work in each village than there was under the DWSS managed schemes. That's good: with the scaling up of the sanitation project there is again work to be done in training communities.

4 Community Service Provider Level

This case study looks at the water services being provided in four villages that were part of the PRWSS project. Although, due to the nature of the project, there is much that is similar between the villages there are some differences. One of the villages, *Daumajral,* was chosen as a control as the service level received, and management of the system was perceived to be inferior to other villages. Although this is the case, *Daumajra* still receives a service that would be considered excellent in many other contexts.

4.1 Context

All four villages are located in SAS Nagar District in Punjab, in Majri and Kharar Blocks – an area roughly 20-30km from Chandigarh the state capital. Although obviously affected by their proximity to a large urban area, their villages are still predominantly agricultural, with the vast majority of families owning land and earning income through agriculture. As in much of Punjab, the land is fertile and most of it is systematically irrigated.

The villages are typically relatively densely populated – all inhabitants live in a single concentrated area, surrounded by fields. The villages are generally close-knit, cohesive communities. As in much of Punjab, the majority of inhabitants are Sikh, and religion plays a key role in the life of the village: for instance, many village meetings are held in the Gurdwara. This cohesiveness is reflected in the politics of the villages: with the exception of *Daumajra*, all return a unanimous Sarpanch. This creates a stable political environment, where continuity is seen as an all-important factor. This environment isn't new either: for example, Singhpura has long been seen as a model village, and residents were proud of a visit by Jawahal Nehru in the 1950's which recognised this status.

Prior to the PRWSS project, households in the villages were accessing water from either private sources (often intended primarily for irrigation) or DWSS-run multi village schemes, which provided limited household connections and variable service. The number of HH connections at this point was as low as 25 in *Daumajra* village (compared to 230 at present).

The villages are generally relatively wealthy – for example, many people have in-house fittings for water and appliances such as washing machines. Generally the only households which relied on a single tap within the compound were SC/ST households.

4.1.1 Infrastructure snapshot

All villages have been provided with near identical infrastructure as part of the PRWSS project, although this has been adapted to meet specific conditions (e.g. borehole changed due to geological structure). All the systems have been designed from the outset to provide full coverage to the village with a service of 70 litres per person per day. The infrastructure comprises:

- deep borehole (typically up to 300m deep), lined with high quality materials, and sealed (and in some cases housed inside a building);
- 3-phase electrical motor;
- automatic electrical switching gear to operate the motor;
- in line chemical treatment (initially this was silver ionization, but due to the cost of replacement parts this was replaced with chlorination);
- a 50,000l elevated service reservoir, at a height of 20m;
- distribution network with household connections and meters (where appropriate).

Singhpura and *Daumajra* were constructed in 2009, Ghataur in 2011, and Shahpur in 2013. All the infrastructure created has been built to a very high quality: the boreholes are significantly deeper than current groundwater levels (~ 300m vs 65m), access deep aquifers and are lined with stainless steel casing. All villages have comprehensive drilling logs and system diagrams readily to hand. In each village the borehole and service reservoir are located inside a sizeable compound (land for which was donated by the Gram Panchyat) which is securely fenced off. In addition each compound has been immaculately landscaped and cared for by the GPWSC. Table 4.1 provides information on the number of household connections before the PRWSS, at the scheme initiation, and in July 2015, giving some idea of the scale of the systems.

Table 4-1 Number of household connections in each village

# Connections	Singhpura	Shahpur	Ghataur	Daumajra
previous multi-village scheme	30	140	160	25
initial connections due to PRWSS	159	161	204	180
Present connections	230	194	234	230

4.2 Community service provider descriptors

As per the guidelines of the PWRSS, each village has constituted a Gram Panchyat Water and Sanitation Committee (GPWSC). This committee is a formal sub-committee of the Gram Panchyat (the lowest level of local government in India) and shares a common Sarpanch, or chairperson. However the GPWSC is a legally separate body, with it's own bank accounts, and is the legal owner and operator of the water supply system.

4.2.1 Composition of the GPWSC

The size of the GPWSC varies depending on the village (it is at least 11) and membership is chosen through a Gram Sabah (village-wide meeting) and it must comprise the following groups:

- four members must be from the Gram Panchyat;
- 1/3 of members must be women;
- 1/3 of members must be landless, or classed as below the poverty line (BPL);
- 1/3 of members must come from a scheduled caste (SC);
- the Junior Engineer of the DWSS (JE) sits of the GPWSC as the technical member.

These categories can overlap – for instance a female member from a SC, would count under both quotas. It is of interest that Panchyat members are always in a minority on the committee helping to avoid an undue concentration of power in the community.

The election of the GPWSC appears to take place on a free and fair basis. Central to this appears to be oversight from the DWSS: at the Gram Sabah the Executive Engineer (one of the highest district level officers) is present which many people cited as providing accountability. Anecdotally, this was implemented afterwards in some scheme villages, the GPWSC was chosen solely by the Sarpanch chose rather than Gram Sabah, and these schemes failed to perform well. Elections take place every five years. In Singhpura, Shahpur and Ghataur the elections have always returned a Sarpanch unanimously. This continuity has helped to ensure that the GPWSC has not fallen prey to the political wranglings which can endanger continued supply.

In *Daumajra*, the last elections in 2013 resulted in a change in Sarpanch and it is this which it is suggested was at the root of the decline in service (as explored below).

4.2.2 Financial accountability

Key to the accountability of the GPWSCs is the financial systems in place: the Sarpanch, secretary and JE must sign off all expenditure. This may be seen as interference by the DWSS in the activities of the GPWSC but helps to ensure money is expended wisely. Financial transparency is ensured, in part, by all GPWSCs having a 'transparency board'. This lists all the financial information for the last month (tariff collected, money expended, total savings) and is displayed outside the pump-house.

Figure 4-1 Transparency board for Ghataur village, showing figures for October 2014

4.2.3 Staffing

The staffing of the GPWSCs is minimal – comprising at most a pump operator and accountant. In some villages these roles are combined or held by volunteers. Table 4-2 gives a breakdown of the staffing levels and salaries in each village.

Table 4-2 Staffing and salaries for GPWSCs

Village	Singhpura	Shahpur	Ghataur	*Daumajra*
Pump Operator	INR 4,000*	INR 4,500	INR 5,000	INR 5,500
Accountant	INR 3,000	INR 1,000	volunteer	work done by pump operator

***In Singhpura the pump operator is now paid an additional INR 3,500 to maintain the sewerage system**

Due to the automated pumping system, much of the work of the pump operator is limited to minor repairs and maintenance. The only component that needs regular maintenance is the treatment system, whilst most repairs are due to damaged pipes. There was no formal training for either the pump operator or accountant, but there is significant mentoring from the JE. This included, for example, taking the pump operator to experience and help with repairs in adjacent villages to understand how to fix common problems, and assisting where the pump operator did not have the skills to make repairs by themselves. This support started at an intensive level, but has progressively decreased. During visits to the villages, the pump operator was observed making repairs to the system independently of any assistance.

4.2.4 Community Service Provider/GPWSC Focus Group

In all the villages, meetings were held with the GPWSC both in November 2014 and June 2015, to gain feedback from committee members on the functioning of the system and support offered by the DWSS. In all of the best practice villages, there was widespread approval of the way the PRWSS project was run, and the support offered by the DWSS. There was no sense that communities felt that they were unable to call on support when needed, or unable to run the services successfully. In Ghataur there was a desire to move to full metering and a 24x7 supply: which was in progress in November 2014 and complete by May 2015. In Ghataur and Shahpur there was feedback that water was now 'solved' and that the most pressing issue was wastewater: most houses have septic tanks, but wastewater flows in open drains to village ponds. This is something which may be addressed under a new World Bank funded project (starting as of May 2015), but some villages expressed concern that there was insufficient space for the necessary infrastructure.

Daumajra was significantly different. During the November 2014 visit it was not possible to arrange a meeting with the GPWSC as it was largely non-functional. Discussions were held with the previous secretary of the GPWSC and the pump operator which, although useful, cannot be seen as unbiased. The service had declined from 24x7 to less than five hours a day, and it was alleged this was largely due to the new committee failing to respond to issues with the water system, and not holding regular meetings (or indeed any meetings for the last year and a half). It was also alleged that use of booster pumps, and illegal 201s to circumvent meters was widespread. There was a significant backlog of bills for some customers. Despite this background, the pump operator was still carrying out many of his tasks.

On the second visit to *Daumajra* the picture was very different: it was apparent that the DWSS had stepped in and forced the GPWSC to meet regularly and address some of the issues at hand. Whilst service levels had not yet improved, there appeared to be support for the committee and people were generally pleased with the work that was being done. It was also claimed that many of the pending bills had been paid. It is too early to say how deep-rooted or long-lasting this change will be. It is also unclear why the DWSS did not step in to rectify this situation sooner.

4.3 Community service provider indicators

To understand the performance of the GPWSCs across a range of parameters, a QIS was developed. This assigned a score from 0 to 100 to each parameter, the results of which can be seen in Table 4-3. In addition, the research concept included an analysis of the state of infrastructure to understand the capacity of the CSP to maintain physical assets. Due to the relatively new nature of the PRWSS project, and the high quality of the assets, formally completing this seemed superfluous.

Table 4-3 QIS indicators for Punjab GPWSCs

QIS indicator	Singhpura	Shahpur	Ghataur	*Daumajra*
1.3 Selection of the Board of the service provider	100	100	100	100
1.4 Information sharing and accountability mechanisms	75	75	75	75
2.2 Cash reserves	100	100	100	100
2.3 Book keeping	100	100	100	100
3.1 Technical folder	75	75	75	75
3.2 Registry of operational information	100	100	100	100
3.4 Water metering	100	50	100	100
3.5 Waters security measures	N/A	N/A	N/A	N/A
3.6 Water quality management	50	50	50	50

As expected, the CSPs generally perform well across all QIS indicators. It is worth pointing out that the indicators, as designed for this project, do not easily highlight some of the weaknesses in the CSPs - particularly *Daumajra*. For instance, the selection of the GPWSC committee in *Daumajra* followed

appropriate processes, it was the performance of the committee following the election which caused issues in the performance of the service.

Looking at the areas which score less than 100, water security is the obvious point to address. All villages have an innate understanding of water scarcity through their use of ground water for irrigation: people are aware of falling groundwater levels and the consequences of this. However, there is no formal monitoring of this, and no measures are in place to address the issue, e.g. rainwater harvesting. For water quality, regular testing takes place by the DWSS, but it is not clear how or if this is fed back to GPWSC systematically, and if this is used to inform water treatment procedures.

4.4 Community service provider participation assessment

Building on the idea of a participation ladder, an attempt was made to assess the nature of the involvement of the community in running the water supply. This was done by matching the community involvement witnessed in each village, and evidenced through discussions with the GPWSC, DWSS and users, to one of five statements. This was done for each stage of the delivery cycle. As all villages are part of the same programme, and work in similar ways, the results were the same for all villages (Table 4-4).

Table 4-4 Type of participation

Stage of delivery cycle	Capital Investment	Service delivery	Asset Renewal	Service enhancement or expansion
Type of participation	Interactive participation	Self-mobilisation	Self-mobilisation	Self-mobilisation

The definitions for the type of partnership are as follows:

- **Interactive Participation:** The community in partnership with the service provider and/or support entities engage in a joint-analysis of implementation options before developing a plan. This is the second highest level of community involvement
- **Self-mobilisation:** The community practices self-supply and: a) take responsibility for administration, management and operation and maintenance, either directly or by outsourcing these functions to external entities; b) invests in asset renewal, or identifies need and seeks external support for asset renewal; c) invests in service enhancement or expansion, or identifies need and seeks external support for service enhancement or expansion. This is the highest level of community involvement.

This assessment should come as no surprise: a key plank of the PRWSS has been to involve communities from the start and this has been borne out in the implementation. Although the DWSS is there to support to on-going running and renewal of the system, this support is very much on a request basis – as seen in the failures in *Daumajra*. This clearly marks the villages out as practising a form of self supply.

4.5 Community Service Provider Costs

The four villages studied in this case are unusual, in the wider context of community managed water supply, in that they all fully cover operation and maintenance costs through the collection of user tariffs. There is no subsidy from external sources for ongoing operation and maintenance, and where

money has been provided by the DWSS (for example *Daumajra* receive a INR 75,000 award in March 2014) this has contributed directly to increased reserves. Furthermore, all four villages have been able to build up significant cash reserves - largely through making an operating surplus. A full analysis of costs is provided in section 6.

Beyond water: community managed sanitation

Singhpura has long been recognised as a model village, and as part of the PRWSS project it was chosen to receive investment for improved sanitation. Although nearly all households already had septic tanks there was no systematic faecal sludge management, and wastewater was left to run in open drains to small ponds. As part of the project a small bore (settled sewage) sewerage system was built along with a series of three oxidation ponds and sludge drying beds at a cost of INR 12,600,000 with a community contribution of INR 117,000 (less than 1% due to a maximum contribution of INR 400 per household, INR 200 for SC households). Sewerage schemes were only implemented when at least 70% of households gave a commitment to construct latrines and connect to the sewerage system (at a cost of INR 250 per hosuehold).

Figure 4-2 Sludge drying beds, with the third oxidation pond in the background.

However, in a significant difference to the water supply, although the community owns the system, and is responsible for operation and maintenance this has been contracted out to a private provider for an initial term of five years. This contract includes full responsibility for maintaining and repairing the sewerage system, managing the oxidation ponds and emptying of septic tanks (for which households will be charged INR 200 a time). The GPWSC has agreed a fixed price contract of INR 800,000 for the five years, which will be financed by selling the treated water to farmers for irrigation, and selling the dried sludge as fertiliser. It is not clear to what extent this is a sustainable financial model.

In terms of the typology of community management this is a concrete example of a fully professionalised system with community oversight – and maybe acts as an indication of how community managed water may be operated in future. As of June 2015 the oxidation tanks were complete and operational, and faecal sludge collection was due to start shortly.

5 Household Service Levels

To understand if the model of community management and enabling support environment implemented in Punjab is effective it is necessary to understand the service received by individual households.

5.1 Coverage

In all four villages the VWSC acts as the sole service provider – other than boreholes for irrigation purposes there are no alternative water supplies available. In all four villages, as a result of the PRWSS project, there is practically 100% coverage of household connections, with a very small number of households relying on private boreholes which predate the piped water supply. Indeed, in the data collected for this study the number of connections exceeded the number of households due to connections for communal buildings such as schools and gurdwaras, and househilds with multiple connections (for example communal family homes). All the villages have a minority of SC households, but there is no differentiation in provision of household connections.

Creeping Urbanisation: when is a village no longer a village?

In common with the other villages in this study Singhpura is a compact, tight-knit agricultural community. But there is one significant difference: Singhpura is close to the small but rapidly expanding city of Kurali. This has led to increased demand for land for housing, and nearly 100 new households have settled on the outskirts of the village. But this development is unsanctioned by the local government, and the settlers have not paid into the development fund to help meet the costs of expanding essential services.

Because of this the GPWSC is unable to expand the network and provide household connections – the DWSS policy explicitly forbids this and with the JE on the GPWSC it can't be ignored. As a result the majority of these new households have invested in private shallow boreholes at a cost of approximately INR 30,000 per borehole. So the barrier to service provision isn't cost: the total spent on private boreholes (estimated at INR 2.5 million) would be enough to extend the network. And it isn't availability of water: the borehole has a predicted yield of 50,000 l/hour and extraction is currently only 36% of this (well below the 60% maximum recommended).

But the picture is complicated. Many villagers wanted to extend service to the new settlements: they recognised that having inequality of provision is likely to lead to an 'us vs them' attitude, and they strongly value the collective nature of the village. At the same time they are wary of increased urbanisation, fearing that their village will be subsumed into Kurali. This would lead not only to a loss of identity, but potentially an inferior water service: Kurali currently receives water for only four hours a day.

However, this coverage only applies to the formal area of the village: in Singhpuraa significant new development has occurred on previously agricultural land. As this development is unsanctioned it is not possible to provide household connections as it would breach DWSS policy. These households currently use private boreholes as their primary supply. This is explored in more depth in the box titled "Creeping Urbanisation".

5.2 Quantity, Accessibility, Quality, Continuity, Reliability

5.2.1 Singhpura and Ghataur

In Singhpura and Ghataur villages the water supply is available 24 hours a day, seven days a week, with all households surveyed accessing the piped supply. This means (by definition) that all households have a high service level for quantity, accessibility and continuity.

Table 5-1 Service Levels

	Singhpura					Ghataur				
Service level	Quantity %	Accesibility %	Quality %	Continuity %	Reliability %	Quantity %	Accesibility %	Quality %	Continuity %	Reliability %
High	100%	100%	87%	100%	93%	100%	100%	100%	100%	97%
Improved	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%
Basic	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%
sub-standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
no service	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%
n/a	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

In Singhpura four houses perceived that quality was only acceptable rather than good and in both villages a small number of people either reported that water was not regular or that repairs took in excess of 24 hours, leading to lower scores for reliability. It should be noted that this was in stark contrast to the answers provided by the majority of households to the same questions. Although water pressure is reported as being less in summer, this has no obvious effect on the service received by households.

5.2.2 Shahpur and *Daumajra*

At the time of the survey Shahpur and *Daumajra* villages both had intermittent supplies, though Shahpur has since implemented full metering and moved to a 24x7 supply. *Daumajra* previously has 24x7 supply but has since dropped back to an intermittent supply. This was the result of a breakdown in the administration of the system: bill collection was inefficient, individuals removed meters and fitted booster pumps to improve their own supply of water at the expense of others.

Table 5-2 Service Levels

	Shahpur					*Daumajra*				
Service level	Quantity %	Accesibility %	Quality %	Continuity %	Reliability %	Quantity %	Accesibility %	Quality %	Continuity %	Reliability %
High	90%	100%	97%	57%	100%	90%	100%	63%	63%	87%
Improved	10%	0%	0%	20%	0%	3%	0%	0%	20%	10%
Basic	0%	0%	3%	23%	0%	7%	0%	37%	13%	0%
sub-standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
no service	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
n/a	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%

The move to 24x7 would mean that, in a repeated survey, Shahpur would have 100% high service levels for all indicators with the exception of quality, where one household perceived it to be adequate.

Daumajra scores relatively poorly in all areas, though no household receives a sub-standard service. At present the village receives water for a reported 4.5 hours each day (3 hours in the morning and 1.5 hours in the evening), though survey respondents reported receiving anything from 4.5 to 1.5 hours of water each day (with an average of 3.5 hours). This intermittent supply is the reason for poorer service levels in the quantity and continuity indicators. It may also be the reason for the poor perceived quality of the water – this is largely due to the presence of silt and other aesthetic issues with the water, which may be due to varying pressure within the distribution network.

It should be noted that in none of the villages did any household receive a service level of sub-standard or lower for any indicator.

Table 5-3 Water storage

Village	Average storage (all houses) (l)	Average storage (SC) (l)
Singhpura	110	111
Shahpur	867	968
Ghataur	716	311
Daumajra	867	833

In all villages multiple tests (at both source and point of use) were made for total faecal coliforms. This was a simple presence/absence test, and all samples returned negative results.

5.3 Storage and Equity

As an indicator of equity an analysis was conducted of any difference in service for those households from scheduled castes (SC). Due to the universal nature of the piped supply in all villages there was no difference in access to water between households in any of the four villages. There was however a difference in storage capacity: whilst this is has no impact on the service levels when a 24x7 supply is provided (as in Singhpura and Ghataur) it is a key factor in the quantity of water available in an

intermittent supply. In the villages studied most storage took the form of plastic tanks installed on the roof of the house.

The Table above shows that only in Ghataur do SC households have significantly less household storage, and as this is 24x7 supply it has no impact on the quantity of water accessed. In the same village it was noted that SC households were less likely to have internal fittings for water, relying on a single yard tap. Whilst this is beyond the remit of the GPWSC, and does not change the service that is available, it will inevitably limit the quantity of water they use. In *Daumajra* there was variability in service based on location in the village – more distant houses report lower water pressures. However this did not correlate to any measures of social or economic status.

5.4 Community and household views

This section aims to present a qualitative analysis of the views of end users, gained through focus group discussions in the villages and feedback gained during the household survey data collection. As an overview survey respondents were asked to rate their satisfaction with the service they receive. These results are given in Table 5-44. As can be seen, in the best practice village's user satisfaction is very high, with little difference between summer and non-summer. Only one respondent was not satisfied in each of two of the villages – on both cases this appears to be due to the presence of silt in the water. In *Daumajra* user satisfaction is much lower, with less than 50% of respondents reporting that they are very satisfied during the summer. However, the number of respondents who are not satisfied is still low (only 2) suggesting that the water service is still acceptable to the majority of users. Comments in the household survey focused on the perceived quality of water (suspended silt in the water) the restricted hours of operation and available pressure and a lack of involvement in the management of the GPWSC.

Table 5-4 Number of users satisfied with water service in their village (n=30)

	Very Satisfied		Somewhat Satisfied		Not Satisfied	
Village	Summer	Non-Summer	Summer	Non-Summer	Summer	Non-Summer
Singhpura	28	27	2	3	0	0
Shahpur	27	27	2	2	1	1
Ghataur	26	26	3	3	1	1
Daumajra	13	17	15	13	2	0

During focus groups it was apparent that the majority of users in the best practice villages were extremely happy with the service they received and the support given by the DWSS. Several women commented that they now had more time to relax (even watch their favourite TV serials) as they spent less time collecting water or filling storage. In all three villages large groups attended the discussion and there was little dissent that the system was functioning effectively. In all three best practice villages there was strong support for the work of the GPWSC – this may be a reflection of the cohesive nature of the villages, with Gram Panchyats being elected unanimously. There were also comments that individuals felt involved in the decision-making process surrounding water supplies. This strong support may in part be due to the fact that the water system serves the entire village in an equitable

way, so there is little ground for resentment between villagers. Residents in both Ghataur and Shahpur stressed that improved sanitation and sewerage was now the priority for support from the DWSS.

In *Daumajra* it was not possible to organise a focus group on the first visit due to a lack of any activity by the GPWSC. As such feedback was limited to responses to the household surveys, and a few individuals such as the current pump operator and previous general secretary of the GPWSC. It is likely that this feedback is not truly representative. The feedback was heavily centred on the regression from a 24x7 to intermittent supply with a feeling that this was, in part, due to unrealistic promises made by the Sarpanch during the election. Allegedly this included promising not to charge for water, though the accounts for the GPWSC show continuing income from tariff collection. Several responses to the household survey claimed that the GPSWC did not respond adequately to issues regarding the water service. There was also a common feeling of inequity: a combination of uneven ground and widespread use of 'booster' pumps meant that some households suffered from inadequate pressure, and felt that they were not receiving the amount of water they were entitled to. Obviously those who used booster pumps reported that they were happy with the service.

It should be noted that on the second visit to *Daumajra*(in June 2015) there was a significant change in attitudes. Although the intermittent service had not improved, the GPWSC was visibly more active, and there appeared to be support for their activities. To what extent this was genuine, versus an attempt to provide a good impression for the research team is impossible to judge.

6 Costing

6.1 Capital costs

The capital costs of the project are split into hardware (physical infrastructure) and software (the cost of information and education campaigns, and training conducted at the start of the project). As the physical infrastructure across all project villages the hardware costs are similar: all villages have a deep borehole with three -phase electric motor, simple treatment (either in-line chlorination or silver ionisation) a 50,000 litre service reservoir and local distribution network. The software has been calculated as an average across all villages in the project, using the expenditure on community development and GPWSC capacity building accounted for the in the project, and an estimate of DWSS staff time involved in the delivering the software component (the major component). It does not include the staff time attributed to designing or constructing the infrastructure.

Table 6-1 shows capital expenditure (both hardware and software) for all four villages and community contributions. All costs have been converted to 2014 prices.

Table 6-1 - Capital Expenditure (hardware and software) for each village

Village	Singpura	Shahpur	Ghataur	*Daumajra*
Date	2009	2013	2011	2009
CapEx HW	INR 4,375,460	INR 3,579,763	INR 4,398,200	INR 4,982,260
CapEx SW	INR 290,812	INR 288,233	INR 285,654	INR 281,785

The community contribution was initially set at 10% of total capital expenditure: as one of the first Singhpura paid this rate. However, the level of community contributions was seen as a barrier to communities and later reduced: the three other villages paid a fixed rate of INR400 per household, with SC households paying only 50% of this.

In addition to this upfront contribution, users also paid a fee to the GPWSC to receive a household connection. For houses connected as part of the initial project this was fixed at INR 560 (half for SC households), with capital costs met from the project budget. This has the effect of delaying a significant proportion of the community contribution until the point at which users receive a service. Subsequent connections are charged at a fee determined by the VWSC. The connection charges collected in Singhpura were small compared to the up-front community contribution, but in the remaining villages the charge effectively doubled the contribution of the community the capital costs.

Table 6-2 Community contributions to capital expenditure, as part of initial construction and subsequent new connections

Village	Singhpura	Shahpur	Ghataur	*Daumajra*
Upfront community Contribution (*estimate)	INR 332,000	INR 50,500	INR 70,000	INR 89,200*
Community Contribution % (*estimate)	10.0%	1.5%	1.9%	2.4%*
# initial connections	159	161	204	180
Total initial connection charges	INR 89,040	INR 90,160	INR 114,240	INR 100,800
# new connections	71	33	30	50
User contribution to new connection	INR 2,060	INR 1,560	INR 1,560	INR 1,560
Total additional connection charges	INR 123,540	INR 57,420	INR 52,200	INR 87,000
Total community contributions	INR 146,260	INR 51,480	INR 46,800	INR 78,000

In addition to the initial capital costs, all villages have seen additional connections made to the systems. This incurs a capital cost (approximately INR 1740 including cost of the meter and installation by a contractor) but also attracts a contribution from the user. Although data does not exist on exactly when new connections have been made Table 6-2 shows the total number of new connections made since the scheme was commissioned, and the costs associated with this. As shown in Table **Error! Reference source not found.** 6-2, Singhpura GPSWC has made a small profit from this activity, and the other GPWSCs a very small loss.

6.2 Recurrent costs & revenue – Opex, hardware & software

The recurrent costs of operating and maintaining the water supply systems, including full electricity charges (GPWSCs pay full non-domestic rates), are met entirely from user tariffs in each of the villages. This makes the Punjab case somewhat unusual in terms of community management. As part of the PRWSS project, VWSCs are expected to charge a tariff that covers regular operation and maintenance. Although the VWSC makes the ultimate decision on the tariff level, the JE offers advice on the correct level and it appears this is strongly heeded. It has been possible to calculate the average tariff from both the responses to the HH survey and the financial records for 2014 (

Table 6-3). Only in *Daumajra* is there a considerable discrepancy, suggesting that bill collection efficiency may not be as high as the other villages. In all villages it was observed that the VWSC took a relaxed attitude towards bill collection: households were permitted to pay several months in arrears, though there was an understanding that bills would always

Village	Average Tariff (HH survey)	Average monthly income per connection
Singhpura	INR 224	INR 217
Shahpur	INR 130	INR 133
Ghataur	INR 178	INR 171
Daumajra	INR 192	INR 119

be paid eventually. This said it appeared the collection efficiency was high, with Singhpura GPWSC estimating non-revenue water at 10%. Ghataur village has a 20% fine for late payment.

Table 6-3 Bill collection efficiency in all villages – tariff reported by users and monthly income reported in accounts.

Village	Average Tariff (HH survey)	Average monthly income per connection
Singhpura	INR 224	INR 217
Shahpur	INR 130	INR 133
Ghataur	INR 178	INR 171
Daumajra	INR 192	INR 119

The GPWSCs were able to provide full records of all income and expenditure. Using data for 2014, it has been possible to calculate annual operation income and expenditure, and the subsequent operating surplus (Table 6-4 Summary annual operating income and expenditure). The income for Singhpura includes a substantial number of new connections.

Table 6-4 Summary annual operating income and expenditure

Item	Singhpura	Shahpur	Ghataur	*Daumajra*
Income from tariff collection	INR 573,735.00	INR 259,255.00	INR 468,540.00	INR 356,942.00
Expenditure on electricity	INR 341,380	INR 204,770	INR 311,010	INR 266,640
Expenditure on salaries (pump operator and accountant)	INR 72,000	INR 65,500	INR 59,500	INR 66,000
Other expenditure (minor maintenance)	INR 37,414	INR 17,481	INR 27,039	INR 1,917
Total expenditure	INR 512,917	INR 287,751	INR 441,988	INR 353,873
Annual Operating Surplus	INR 90,070	INR 22,984	INR 42,152	INR 18,669

The VWSCs receive no financial support from the DWSS to support operation and maintenance, but support is given in the form of the JE offering technical advice and sitting on the VWSC; other DWSS staff providing support visits; the provision of chemicals for water treatment (initially at least – this is now paid for by GPWSCs themselves); and regular water quality monitoring. Of this the provision of chemicals can be seen as direct support for operating expenses and the remainder fulfils a monitoring and advice function. The cost of the chemicals for water treatment is minimal – if this cost was to be passed on to the VWSCs existing income would be more than adequate to meet it.

Table 6-5 Support costs from the DWSS

Support item	Singhpura	Shahpur	Ghataur	*Daumajra*

DWSS staff for support and monitoring	INR 126,720	INR 125,44.	INR 124,160	INR 122,240
Provision of chemicals for water treatment	-	INR 1,000	INR 1,000	-
Water quality monitoring	INR 1,380	INR 1,380	INR 1,380	INR 1,380

The calculation of the cost of DWSS staff support has been based on the average number of visits to each village by staff at various levels, hence the only difference in cost is due to travelling expenses. This is likely to be an overestimate for *Daumajra*, given the acknowledged difficulties it has faced over the last 18 months and the reduced level of intervention from the DWSS.

6.3 Capital maintenance costs – hardware and software

Due to the recent construction of the schemes and high quality of materials used, relatively little capital maintenance has been undertaken. The only examples available so far are of Singhpura and Ghataur investing in back-up motors at a cost of INR 50,000. Ghataur is considering installing a solar pump, and is looking for funding via various government schemes to support this, whilst *Daumajra* is planning to purchase a diesel generator.

All villages had seen additional connections to the systems since construction, considered a form of CapManEx. Although this expenditure wasn't accounted for separately in the accounts available (included in 'other' costs) it has been possible to estimate average annual expenditure on this based on the total number of new connections since construction and the cost of an individual connection (given at INR 1740, including materials and labour) (Table 6-6). This estimate has been used to adjust the recurrent income and expenditure in Table 6-4. This estimation was not used for Shahpur village: as it has only been operational for one full year, this led to a high number of annual new connections, resulting in an estimated negative spend on operation and maintenance.

Table 6-6 Annual income and expenditure for new connections

Item	Singhpura	Shahpur	Ghataur	*Daumajra*
Average new connections/ year	14	33	10	10
Annual cost of new connections	INR 24,708	INR 57,420	INR 17,400	INR 17,400
Individual connection contribution by household	INR 2,060	INR 1,560	INR 1,560	INR 1,560
Total annual household contribution to new connections	INR 29,252	INR 51,480	INR 15,600	INR 15,600
Annual contribution to new connections from GPWSC reserves	-INR 4,544	INR 5,940	INR 1,800	INR 1,800

It can be seen that the connections charges are largely cost reflective: Singhpura GPWSC makes a small profit on new connections, whilst other villages run at a small deficit.

6.4 Capital maintenance reserves

In addition to running operating surpluses, all four villages have been able to build up substantial capital maintenance reserves – that is money which can be used to fund future capital maintenance of the water supply system. Table 6-7 gives details of all reserves held by each GPWSC in this study, along with the operating surplus for 2014. It also calculates the average annual surplus that would need to be generated over the lifespan of the scheme, to generate that level of reserves. Other villages in the scheme have been able to build reserves as high as INR 10,00,000.

Table 6-7 Capital maintenance reserves and operating surpluses

Village	Singhpura	Shahpur	Ghataur	*Daumajra*
Reserves (Dec 2014)	INR 217,297	INR 89,633	INR 86,011	INR 279,584
Operating Surplus (2014)	INR 90,070	INR 22,984	INR 92,652	INR 18,669
Average surplus per year	INR 43,459	INR 89,633	INR 28,670	INR 55,917

There is some discrepancy between the level of reserves and the operating surplus. Two villages (Singhpura and Ghataur) have invested in backup motors at a cost of INR 50,500 which partly explains why the reserves are lower than the operating surplus would indicate. Singhpura has also significantly increased the number of connections (from 159 to 230) which might mean that operating surpluses are higher now than earlier in the project – costs such as electricity and salaries are unlikely to change significantly, whereas income from tariffs will increase.

Daumajra has the highest reserves, but also the lowest operating surplus. It has however been operating since 2009 (the joint-longest with Singhpura) and has not spent any money on capital maintenance, although there are plans to invest in a back-up generator at a cost of INR 200,000 to overcome intermittent power supplies. The reserves were also boosted in April 2014 by the payment of INR 75,000 from the DWSS. This was in recognition of operating 24x7 supply successfully for at least one year, post handover. This award has also been received by Singhpura in a previous year, but Ghataur and Shahpur have not yet achieved it.

In all four villages there appears to be an understanding amongst residents that the reserves are intended to be built up for future expenditure, and there is no demand tariffs to be reduced in light of the savings. Indeed, Singhpura has progressively increased the tariff from INR 3/m^3 to 6/m^3, suggesting a strong willingness to pay.

It is widely assumed within community management that it is not possible for communities to cover the future costs of infrastructure replacement. However, this is not necessarily the case in the villages studied. An attempt has been made to model the ability of the villages to cover the cost of replacing short-life infrastructure (such as motors, with a lifespan of 10 years, estimated at 10% of total capital expenditure on hardware) and long-life infrastructure (the borehole and reservoir, over 25 years). This has been done using the annual operating surplus for 2014, so may be an over or under-estimate as per Table 6-77.

Table 6-8 Ability of villages to cover the cost of capital depreciation

	Singhpura	Shahpur	Ghataur	*Daumajra*
Annual shortlife depreciation	INR 33,200	INR 34,770	INR 36,970	INR 37,810
Annual longlife depeciation	INR 119,520	INR 125,172	INR 133,092	INR 136,116
Shortlife (M+E) cover	271.3%	66.1%	250.6%	49.4%
Longlife cover	47.6%	-	41.8%	-

As shown in Table 6-8, Singhpura and Ghataur both fully cover the cost of replacing shortlife components, whilst the remaining villages recover at least 50% of shortlife costs. Due to the high exiting reserves in *Daumajra* this is likely to be an unfair reflection of how well the GPWSC is performing. Beyond this, Singhpura and Ghautar are both capable of covering 48% and 42% respectively of full capital replacement costs, if they continue to make an operating surplus at the current level.

Table 6-9 Summary Cost Table (INR)

Punjab 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 279	-	INR 279	INR 107	INR 267	-	-	INR 103	INR 478
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	INR 139	INR 43	INR 182	INR 1	-	-	INR 166	-	INR 167
National Government	-	-	-	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	INR 3,745	INR 130	INR 3,875	-	-	-	INR 32	INR 202	INR 234
TOTALS	INR 4,164	INR 173	INR 4,336	INR 108	INR 267	-	INR 198	INR 306	INR 879
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	93%	100%	94%	1%	0%	-	100%	66%	46%
Median of 20 case studies			95%						57%

Table 6-10 Summary Cost Table (PPP USD$)

Punjab 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	$ 15.92	-	$ 15.92	$ 6.12	$ 15.21	-	-	$ 5.89	$ 27.22
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	$ 7.93	$ 2.43	$ 10.37	$ 0.04	-	-	$ 9.47	-	$ 9.51
National Government	-	-	-	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	$ 213.47	$ 7.42	$ 220.88	-	-	-	$ 1.81	$ 11.53	$ 13.35
TOTALS	$ 237.32	$ 9.85	$ 247.17	$ 6.15	$ 15.21	-	$ 11.29	$ 17.42	$ 50.07
Median of 20 case studies			$ 184.16						$ 11.78
'Plus' %age	93%	100%	94%	1%	0%	-	100%	66%	46%
Median of 20 case studies			95%						57%

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).

7 Conclusions

This study examined the extent to which community managed water systems in Punjab, implemented under the PRWSS project were successful, and the type and cost of the support that enabled this success.

That the project has been successful is not in doubt: it has received wide coverage to that effect, and even a cursory glance at the villages involved reveals high service levels and effective administration. This is supported by household surveys which showed nearly all households receiving a very high service levels, with two (now three) out of four villages delivering uninterrupted 24x7 supplies.

The support for these villages has been (and is) provided by the Punjab Department for Water Supply and Sanitation – a government body which has long held responsibility for delivering rural water services. Traditionally this has been through direct provision, but as part of the PRWSS project there was a shift to the DWSS supporting communities to manage their own water supplies. This shift in focus and operations has been driven from the highest levels of the DWSS and done in a systematic way. For the PRWSS project, special cells were set up to facilitate the new way of working, and considerable investment is being made in institutional change as part of a new project. This change has been made easier by the adaptation of a Sector Wide Approach (SWAp). This is a clear statement that all rural water development will be carried out in this manner, regardless of where the funding comes from. This provides a clear direction of travel for the DWSS, allied to the scale needed to see wholesale institutional change.

The start of the project was marked by considerable IEC activity, but on-going support to communities takes the form of regular monitoring and mentoring by the Junior Engineer of the DWSS. This is at a level which allows support to be responsive to the needs of the GPWSCs, but also relies heavily on the initiative and commitment of the individual engineer. The cost of this on-going support is estimated at $9.47 per person per year, in addition to the initial cost of IEC at $9.85 per person.

The CSPs in this study perform at a very high level: there is excellent administration and record keeping, whilst all four villages fully cover operation and maintenance costs and, through the accumulation of reserves, would be able to make a significant contribution to the cost of infrastructure replacement and renewal. The high quality of infrastructure created at the start of the program (costing XX per capita), has contributed to both the ease of maintaining the system, and people's willingness to pay. With a high service from the beginning, there is a lower barrier to overcome in terms of convincing individuals that water should be paid for. Delivering supplies is made easier, but the reliability of the water source, and the widespread availability of 24x7 three phase power in Punjab – factors which are beyond the PRWSS project, and would be impossible for communities to address by themselves.

Whilst this is in part due to the support of the DWSS, social and cultural factors play a significant role. It has been observed that the most successful villages form a coherent social group, whilst it is a well-worn stereotype within India that Punjabis are prudent with money and pragmatic in their business dealings. It is impossible to quantify this, or suggest how it may be replicated, but it might suggest a limiting factor in how ambitious community managed water supplies can be.

It is useful to understand where this model sits on the continuum of community managed supplies (Figure 7-1). All the GPWSCs have clear and direct accountability to local people, whilst employing specific individuals to carry out tasks such as maintenance or bookkeeping. Whilst it cannot be

considered fully professionalised (the individuals in question are not necessarily specialists in their area, and are only individuals, with no professional support) it is clearly that delegation of activities has taken place. It is suggested, that the villages may follow a trajectory to increasing professionalization. The development of a sewerage system in Singhpura has already seen operation and maintenance contracted out to a private provider, and there is no reason this model could not be followed for water supplies.

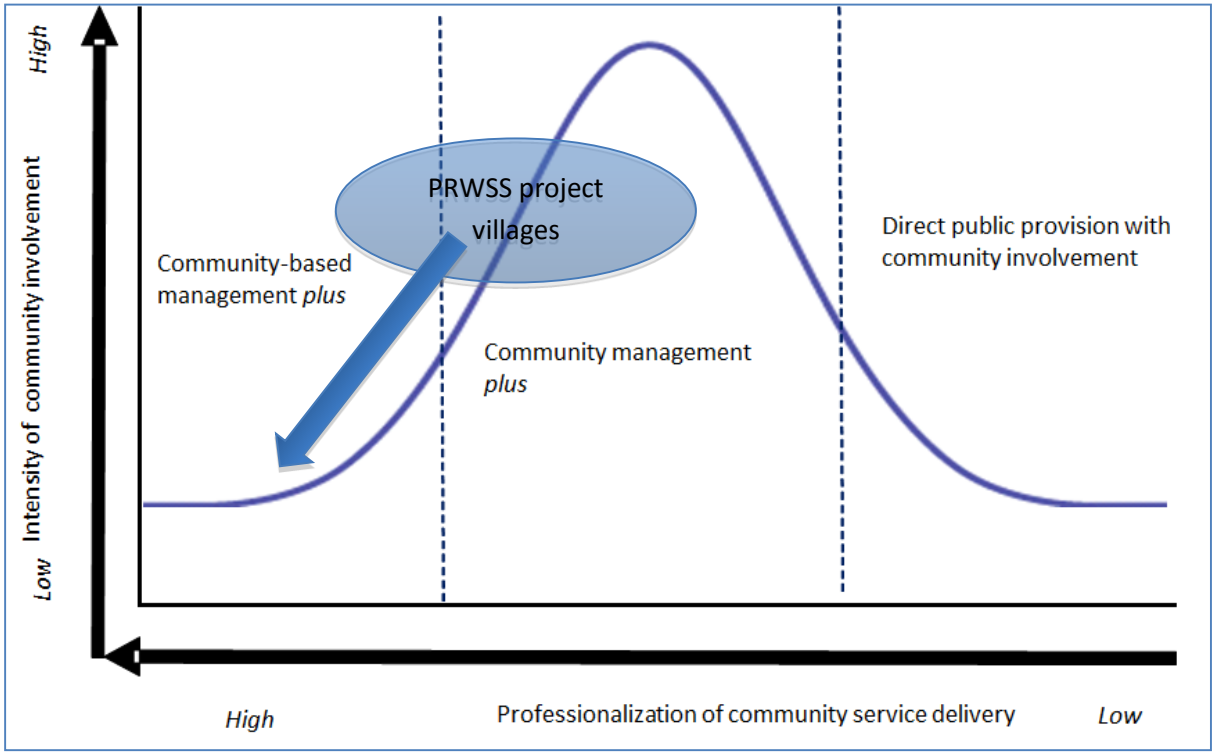


Figure 7-1Continuum of community service provider types

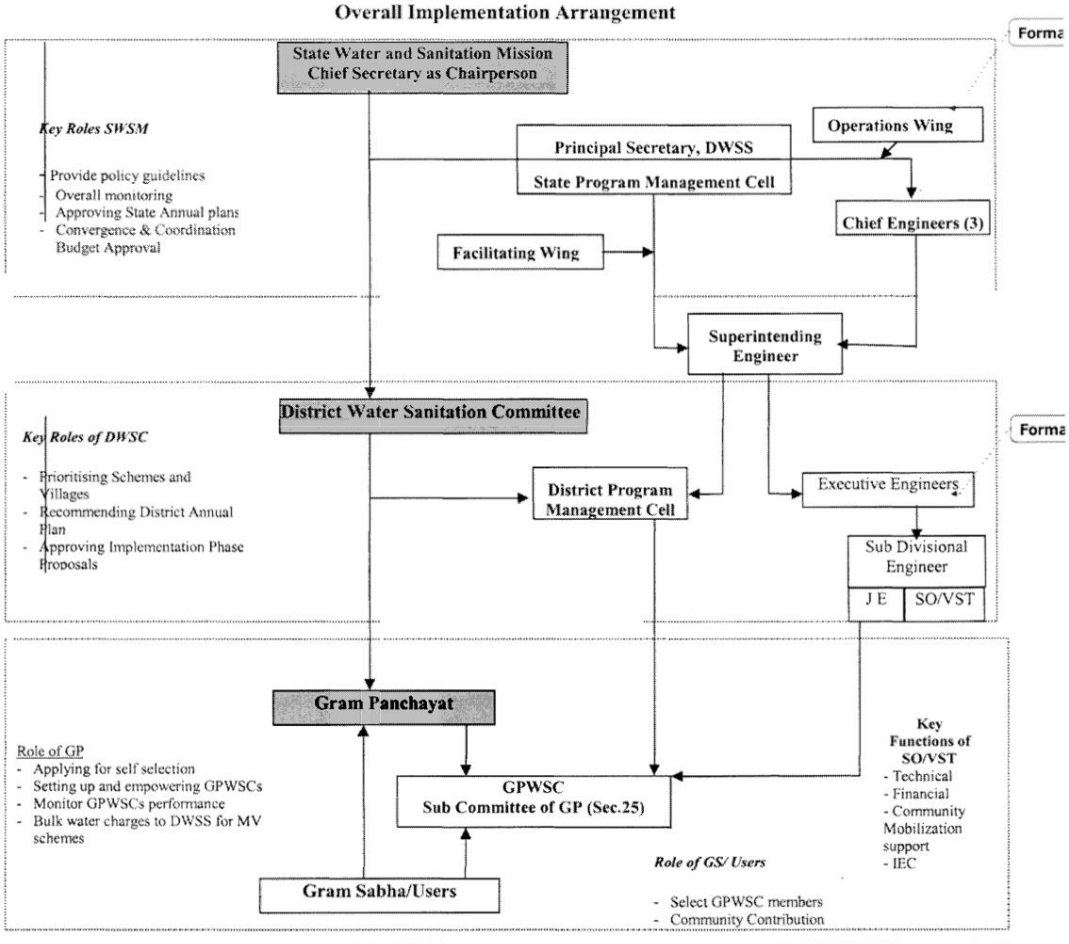
Although it does not come cheaply, and has relied on the institutional strength of the DWSS and cohesiveness of communities, the PRWSS project represents the best of what community management of water can achieve. A genuinely reflective and engaged water committee, which is able to deliver a high quality water service, financed by users themselves. This is not a model which would be suitable for expanding water access to villages for the first time: the underlying institutional strength is too much to expect. However, it should serve as an example of what the ultimate goal should be: not simply 'good enough' supplies but excellent supplies to which people can aspire and feel proud of.

8 Appendices

8.1 Appendix 1 – Organograms for PRWSS project

Annex:6
Attachment 6 A

Proposed Institutional Model
Overall Implementation Arrangement



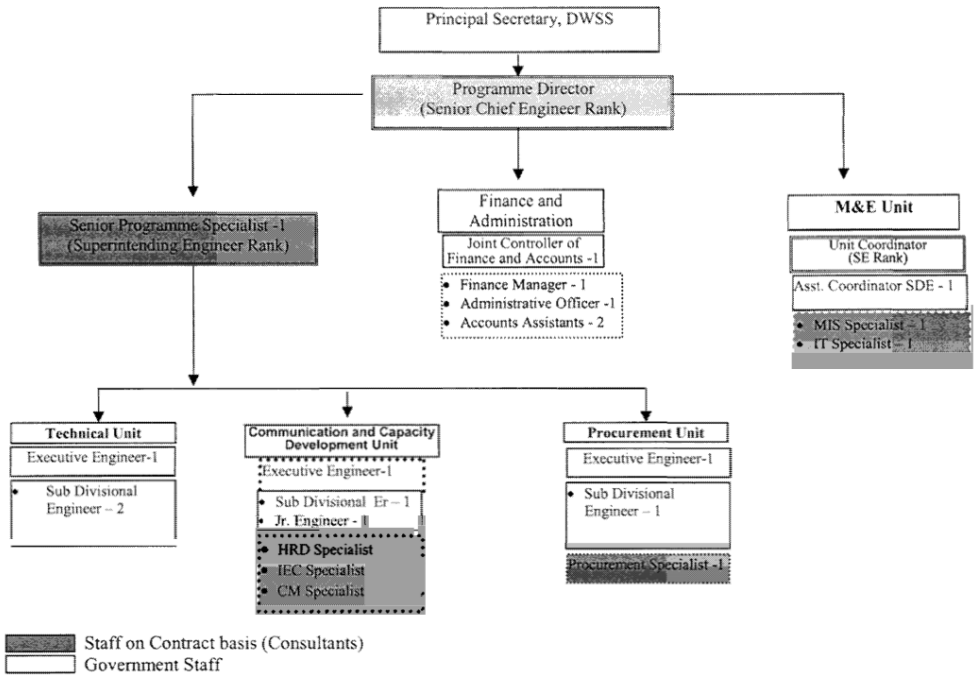
JE- Junior Engineer, **VST**- Village Support Team

Key Roles Facilitation Wing		Key Roles Operations Wing	
Entity	**Roles**	**Entity**	**Roles**
SPMC	- Over all Program Planning & Mgt. - Fund Flow Management - Capacity Building, IEC - Achieving Development Objectives - Quality Control, M & E, Reporting	Chief Engineer	- Head Regional Operations
		Superintending Engineer	- Lead District level Program Management, - Head District Operations
DPMC	- District level Program Planning & Mgt - Achieving Dev. Objective. - Fund Flow Management - Capacity Building, IEC - Quality Control, M & E	Executive Engineer	- Divisional level Operations - Planning, Construction and O&M of MV schemes common facilities - Integrated Engineering & software support to GPWSC for SV schemes, intra village facilities
GPWSC	- Implementation, O&M - Tender approval - Cost sharing by users	SDEs/JE	- Same as that of EE but in their own area

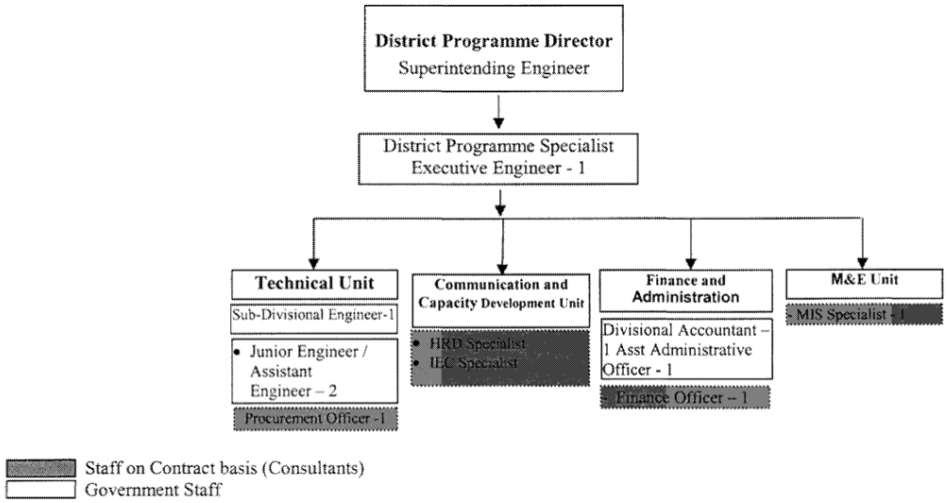
49

Annex:6
Attachment 6 A

Detailed Organizational Structure of SPMC



Detailed Organizational Structure of DPMC



50

8.2 Appendix 2 – Detailed activity-responsibility matrix

	Central Government	State Government entity	Gram Panchayat	NGOs	Water committee	Operator or mechanic	Households
Allocation of finance / Budgetary approval	INT	RES					
Monitoring service levels & water quality	INT	RES + PAY			RES	INV	
Project planning		RES + PAY			INV		
Infrastructure design & implementation		RES + PAY			INV		
Social intervention design and implementation		INV + PAY	INT	INV	INV		INV
Operation and minor maintenance		INT			RES + PAY	RES	
Ongoing software support to community		RES + PAY			INV		
Water resources management measures		RES			INT		INT
Capital Maintenance and renewal		INT			RES + PAY		
Major repair		INV			RES + PAY	INV	
Approval of user charges		INV			RES		
User charge collection					RES + PAY	INV	PAY
Management of community involvement					RES		INT
Community capacity development & Training		RES			INT		INV
Dispute resolution		INV	INV		RES		INT
Paying of water charges					INV	INV	RES + PAY
Institutional & human resources development		INV			INV	INT	
Auditing		INV			RES		
Evaluation/performance assessment		INT					

Community Water *plus*