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: limited on-going support in Himachal Pradesh

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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

The villages in this study of community water supply in Himachal Pradesh were provided with gravity fed drinking water systems under an Indo-German bilateral pilot project which worked in nine villages. There was significant software support from the state Irrigation and Public Health (IPH) department during the implementation phase, but there has been no ongoing support. Two of the villages continue to manage the systems effectively on a highly volunteerism basis, providing a high quality service to users, whilst the third village struggles to manage the maintenance of the system due to geographical issues. Service levels suffer as a result. Although the pilot project provided a template for wholesale community management of rural water supplies, the IPH has adopted a much more limited form of community management for wider implementation. Here only operation (not ownership or maintenance) of the final distribution system is handed over communities. Tariffs are collected by the IPH who pay the full costs of running the system.

Key points are:

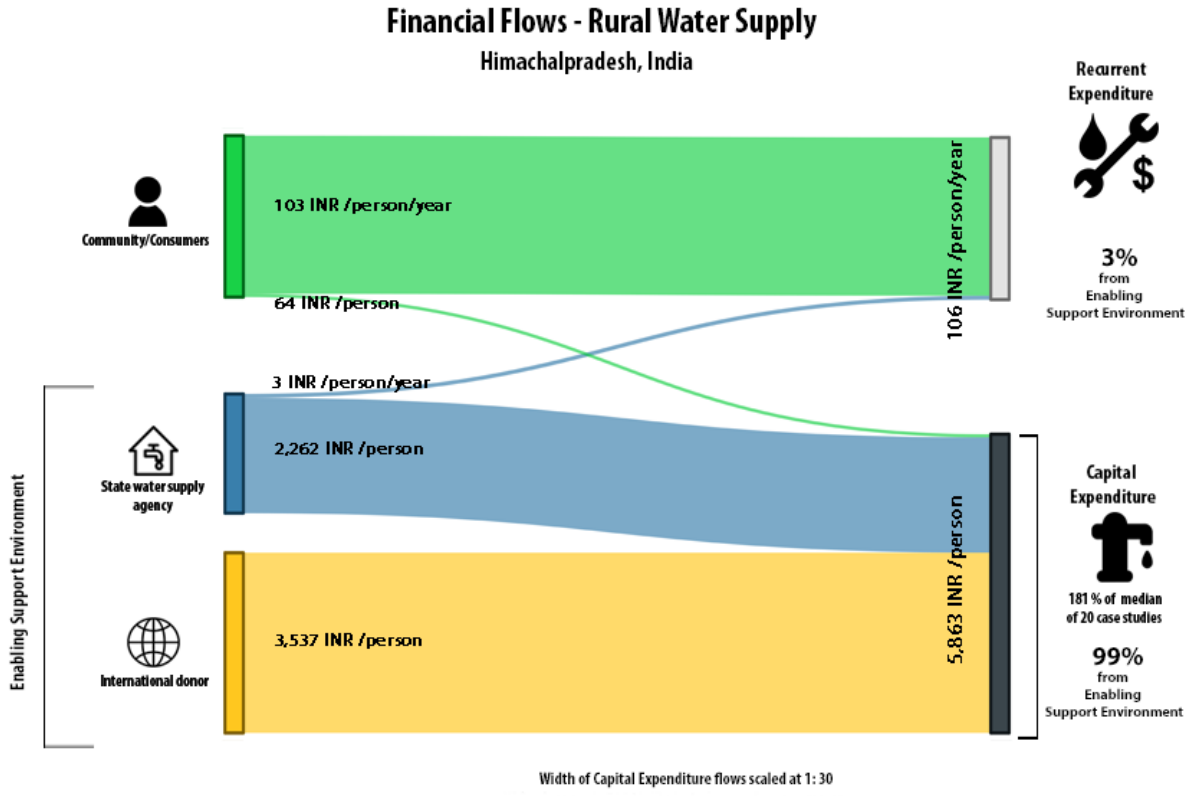
- **Communities can manage water supplies with limited support if the system is technologically simple, and there is substantial up-front support.** The two most successful villages have been able to continue running the system in a sustainable manner, but have also adapted management and operation structures to meet their needs. For example, in one village every household had to send one member to the monthly VWSC meeting, with a INR 10 fine for non-attendance.
- **Transforming public water bodies to support community management requires large scale programmes, small scale pilots can be ignored.** The IPH-GIZ project worked with nine villages, out of 53 thousand habitations across the state. Although a dedicated project unit was set up to manage the programme this did not have influence within the wider IPH, in part due to the small scale of the programme. As a result, the IPH did not adopt the model of community management developed in the pilot, implementing a much more limited form of community involvement.
- **Community management does not ensure equity.** In the two most successful villages there was unanimous agreement that new families should not be able to obtain a household connection (even with payment) as they had not contributed to the construction of the system. Traditionally community cohesion is seen as a strong internal plus for community management, but this an example of the adverse effects of this social structure.

Himachal Pradesh Summary Cost Table - calculated as the average cost per person, that is averaging across the 3 '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 64	-	INR 64	INR 100	-	-	-	INR 4	INR 103
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	-	INR 2,262	INR 2,262	INR 3	-	-	-	-	INR 3
National Government	-	-	-	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	INR 2,166	INR 1,371	INR 3,537	-	-	-	-	-	-
TOTALS	INR 2,230	INR 3,633	INR 5,863	INR 102	-	-	-	INR 4	INR 106
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	97%	100%	99%	3%	-	-	-	0%	3%
Median of 20 case studies			95%						57%

Notes: Expenditure does not include costs of international staff and higher-level state staff for pilot projects with low number of villages; CapEx for initial systems in best practice villages not available and not accounted for

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



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

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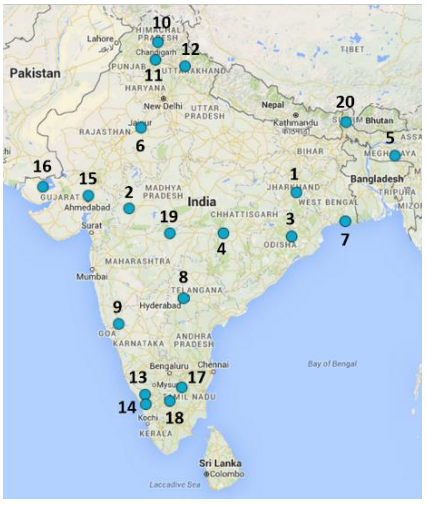

The twenty case studies

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

1 Introduction

1.1 Context: water supply in rural Himachal Pradesh

Himachal Pradesh is a mountainous Himalayan state with a highly dispersed population – nearly 90% of the population live in rural areas (Census of India, 2011). Water is plentiful, although delivering it to habitations can be challenging. Whilst many villages use spring-fed gravity supplies, larger habitations typically need to be provided with water from a 'lift scheme', pumping from a river source in a valley, which entails considerable engineering challenges and costs. During the mid-2000s the state government collaborated with the German agency, GIZ (known as GTZ during the project implementation phase), in a programme to strengthen local government Panchyat Raj Institutions (PRIs). As part of this a pilot project ('Water Availability for Self Help' or WASH) was established to implement community management of water supplies, designed to act as a 'torch bearer' for Swajaldhara implementation – an early nation-wide programme to deliver water through community management – and a template for future community managed water projects. Two of the villages studied have been recognised as successful and reported on previously, whilst the third, although not as successful, was part of the same project and located in the same district. All villages use natural springs to feed a gravity flow system, with household connections.

Table 1 2013-14 GDP of state studied

Himachal Pradesh	USD (PPP)
GDP per person	$ 5,265
Percentage of All Indian GDP	124%

1.2 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.

1.3 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?

1.4 Structure of the report

The following chapters present the analysis and findings of the data: this chapter describes the conceptual framework and methodology of the research. Contributions to the Enabling Support Environment are discussed in Chapter 2. The Community Service Providers' detailed description, their performance assessment, partnering levels and household service levels achieved are analysed and presented in Chapter 3. Chapter 4 presents the costs incurred for delivering the ongoing enabling support environment to achieve best practice. The conclusions from the study are presented in Chapter 5.

1.5 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 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 Waterplus 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

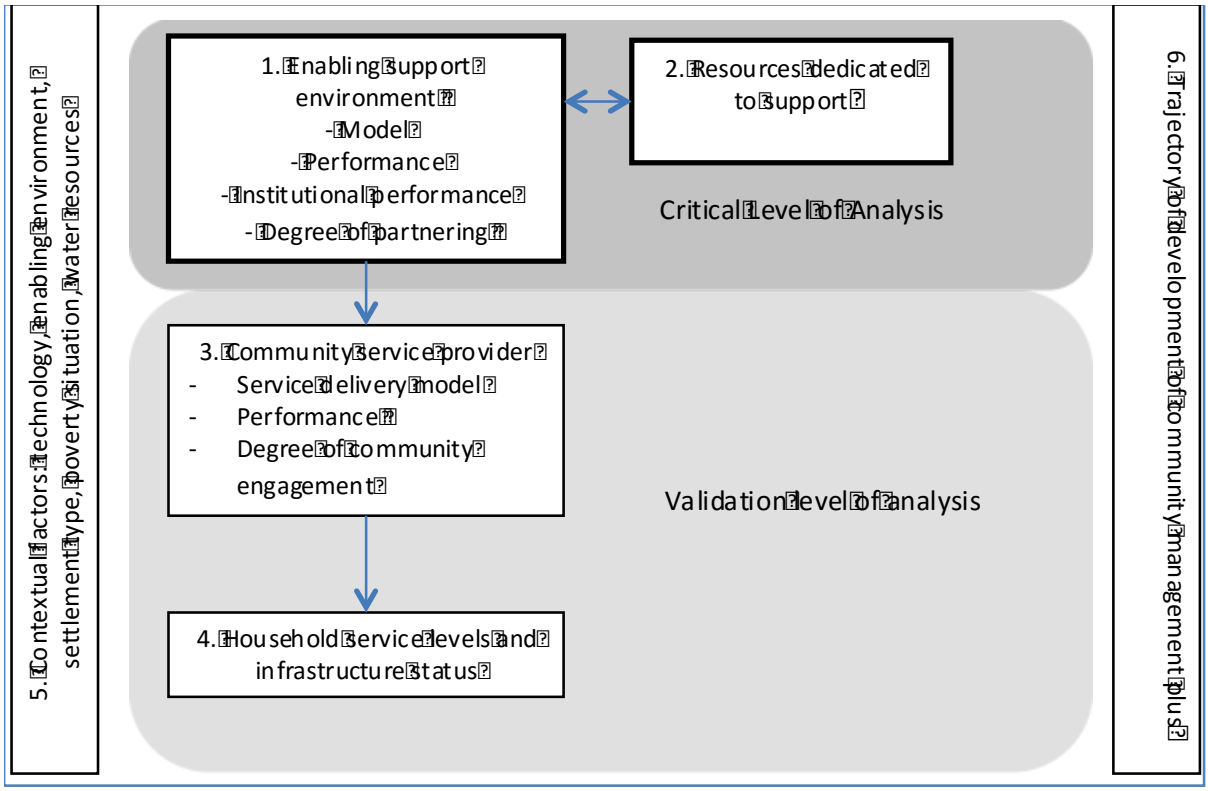

Figure 1 Relationship between the research elements

1.6 Case study selection, data collection and analysis

Fieldwork for the Himachal Pradesh case study was conducted in June 2015, with the enumerator research team accompanied by the authors who focused upon the key informant interviews. Various unpublished documentation was kindly made available by staff of GIZ. The State water supply

agency, Irrigation and Public Health Department (IPH) equally supported the research with particular insights into the functioning of water supply in the control village.

To assess the actual service levels received by end users the project normally conducts 30 household surveys in each of the villages studied. The number of surveys conducted was less in Himachal Pradesh due to the small size of many of the villages, with household numbers ranging from 31 to 55. Although various socio-economic data were collected, at the core of the surveys is analysis of five indicators of service level: quantity, accessibility, quality, reliability and continuity. These were either assessed directly (such as the number of hours water is available for) or indirectly through multiple parameters (to estimate the quantity of water used in lpcd). Each indicator was mapped to one of five service levels (high, improved, basic, sub-standard, no service) based on thresholds developed by the Community Water *plus* project. The service level of basic was based on the Indian norms for drinking water (where appropriate) and can be considered the minimum acceptable level of service.

Three best practice and one control village were chosen: Chahadi, Kothi, Paddar and *Pali.* It was intended that the control village should represent a village in the same area in which the community managed the water supply with no ESE. In practice, due to logistical constraints, the control villages represented different concepts, in Himachal Pradesh being a village which was served under an IPH scheme with limited community involvement.

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)).

In the costing section, all prices quoted are given in Indian Rupees (INR) and are given in historical prices unless explicitly adjusted for inflation.

2 Enabling Support Environment Level

This section provides information on the enabling support environment that exists in the villages studied. In the case study the support environment was provided through a collaboration between GIZ and the IPH, with support from local NGOs in the delivery of some parts of the project. Crucially, this support was only provided during the implementation phase of the schemes, so only activity carried out in this phase can be assessed in this research methodology. The impact of the lack of on-going support will be considered in a more general manner.

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

The IPH was originally created in 1994 after responsibility for water resources was transferred from the Public Works Department to a separate body. In addition to drinking water it has responsibility for sanitation, irrigation and flood protection. It is organised on a geographical basis, with engineering staff based across four zones with 13 'circles'. Because of this organisational structure, all engineering staff have to work on all aspects of the department's work, with no senior individuals focusing on a single issue, such as drinking water. Water supply accounts for less than 30% of the Department's budget of INR 702 crores, with the majority of this allocated to rural water (reflecting the demographics of the state).

Traditionally water supply in the state has been highly centralised, with the IPH taking full responsibility for the construction, maintenance and operation of water systems. In response to the decentralisation provisions of the 73rd Amendment, the Government of Himachal Pradesh devolved extensive powers to Panchayat Raj Institutions in 1994, and explicitly devolved maintenance of small drinking water scheme to Gram Panchayats in 1996. Despite this and further orders devolving ownership of handpumps (2001) as well as giving Gram Panchayats the power to supervise the work of IPH staff (2001), up until the mid 2000's the function of the IPH had seen little change. This was reportedly due in part to a lack of awareness amongst Gram Panchyats of their power and responsibilities, which must imply the absence of a cohesive programme within the IPH to implement these changes.

From 2005 to 2011, the German organisation GIZ took part in a significant programme with the Government of Himachal Pradesh to build the capacity of PRIs to deliver devolved public services (and the capacity of the state to support them) including water supply. The 'Water Availability through Self Help' project was one project within this programme and included the development of a pilot programme for community management of water which would see communities contribute to the costs of constructing the scheme and taking over responsibility for operating and maintaining the system. This was in-line with the (then current) Government of India 'Swajaldhara' programme, but went significantly further than the IPH model of community management.

These nine pilot villages were intended to establish a protocol for implementing full community management which could then be rolled out across the state. This has not happened, with the IPH instead following a much more limited form of community management. This programme of handing over only limited maintenance responsibility, and not ownership of financing responsibilities, to Panchyats began in 2006 and continues to the present day. This forms the basis for the control village in this study.

2.2 Enabling support environment description

The WASH project was a bilateral project between GIZ and the IPH with staff from both organisations contributing to the work. GIZ staff provided technical advice and project management, with IPH staff delivering the project and conducting detailed technical work. External bodies were also engaged including consultants to deliver some research activities and local NGOs to deliver Information, Education and Communication (IEC) activities.

Between 2005 July 2007 project management was provided by the consulting firm RODECO on behalf of GIZ. This phase included preparatory work including selection of pilot villages, internal training for IPH staff and programme design, but no actual programme implementation. As part of the WASH project a dedicated project cell (which worked full time on the project) was created within the IPH, this included the staff listed in Table 2.

Table 2 Activities carried out as part of the WASH project.

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	Supply based	GIZ and the IPH attended regular meetings to monitor physical and financial progress, but only during the capital investment phase
Water quality testing	No			
Water resources management	No			
Technical assistance	Yes	Via an intermediary	Supply based	Technical designs were prepared by the IPH staff.
Conflict Management	No			
Support in identifying investments needs	Yes	Both (directly to service provider and via an intermediary)		The project staff identified enhancements to existing networks/schemes/source during CapEx in collaboration with communities
(Re)training of service provider	Yes	Via an intermediary	Supply based	Significant training activity, but only during capital investment phase
Information and communication activities	Yes	Via an intermediary	Supply based	Multiple IEC activities during capitla investment phase.
Fund mobilization	Yes	Directly to service provider	Supply based	GIZ main funder of capital costs, covered when 10% deposited by village. Software costs covered by GIZ.
Other (selection of villages)	Yes	Both (directly to service provider and via an intermediary)	Both (On request and supply based)	IPH and partners selected suitable villages.

2.3 Enabling support environment performance indicators and institutional assessment.

As part of the research methodology an institutional assessment was conducted by scoring the observed activities and behaviour of the ESE against a series of statements in eight categories from Strongly Agree (4) to Strongly Disagree (1). These scores are presented as a spider diagram below (Fig 2). Based on available information it has not been possible to assess the performance of the various project partners separately. The following assessment is therefore of the support environment of the project as a whole, and can be seen as an assessment of GIZ and the IPH. It should be noted that the assessment framework was designed for long-term supporting organisations, not those which were only involved for a project of a defined period. Thus, many of the categories are not applicable to the assessment here and no score has been assigned.

Figure 2 Institutional assessment for GIZ-IPH WASH project

The WASH Project scores strongly in some areas - such as technical capability, where the engineering expertise of the IPH allowed well designed systems to be constructed, but performs poorly in many other areas. It may be argued that this reflects the performance of the WASH Project unfairly, as the role of the project was never to simply support Village Water and Sanitation Committees (VWSCs), but to pilot and promote a new approach to community management.

The poor score is in indeed due in part to the temporary nature of the programme: although there was considerable staff training (including exposure visits to Germany, for example) there is limited scope to provide a clear career path within a four year project.

In addition, it appears that there was inadequate co-ordination and communication between the partners. A participant evaluation conducted by GIZ highlighted that changes in objectives were not

clearly communicated, such as an increased emphasis on supporting sector reforms. It was also pointed out the GIZ and IPH staff occupied separate offices. Leadership is an area which is scored particularly weakly, although a judgement could only be made on two of the five statements. The weak score is partly due to the apparently differing visions of the IPH and GIZ management, but also reflects the decision of the IPH to not pursue this form of community management beyond the project end. This decision also contributes to the poor score in interactions with external institutions.

Anecdotal feedback from the communities on the WASH project was not strong. Although villagers were happy with the physical infrastructure, there were complaints that there was not always complete transparency in the process – particularly in the delay between villages depositing their contribution and construction work starting. In particular it was remarked in one village that recovering the community contribution (as was promised after collecting a tariff for 6 months following commencement of water supply) took considerable effort, and was only achieved after a visit in person to the IPH office. Although this view was supported in the GIZ evaluation, the evaluation also highlighted that communities were positive about the community participation and IEC aspects of the project. This was not identified during this study, possibly due to the significant period of time which has elapsed.

The score for community orientation is generally strong, but there are identified weaknesses in the ability of the project to respond and adjust to community feedback.

2.4 Enabling support environment partnering assessment

This section will help the reader understand the degree of partnering between the Enabling Support Entity (ESE) and the Community Service Provider (CSP).

Table 3 Enabling Support Environment Assessment GIZ – IPH

Indicator	Score	Explanation
Indicator 1.1. Formality of the mandate for support	100	GIZ-IPH project was authorised by state and had mandate to operate pilot schemes.
Indicator 1.2 Working methods	75	Project had clear tools for IEC etc, unclear if these were always systematic (cf difficulties in village obtaining re-payment of community contribution after collection tariff for 6 months
Indicator 1.3 Information management	50	Monitoring of costs during project was good. No ongoing monitoring at all.
Indicator 1.4 Communication between service support authority and service providers	75	Appears communication was good during implementation. Non-existant subsequently
Indicator 3.1 Client satisfaction	*No evidence available*	No evidence of this
1. Degree of professionalization in the ESE		**Definition**
1.1 Formality of the mandate for support	100	Existence of a formal mandate for support to service providers

1.2 Working methods	75	Number of standard tools and instruments for support applied in a structured manner
1.3 Information management	50	Existence and use of structured mechanisms for tracking information on performance of the service providers attended by the service support and monitoring authority
1.4 Communication between service support authority and service providers		Existence of structured mechanisms for communication with the service providers
3.1 Client satisfaction		Number of service providers indicating satisfaction with the support received / number of service providers supported

Table 4 - QIS Indicators for IPH (Waterguard)

Indicator	Score	Explanation
Indicator 1.1. Formality of the mandate for support	100	Clear mandate flows through NRDWP. Detailed MoU outlines support responsibilities
Indicator 1.2 Working methods	75	BRC hired through NGOs but no knowledge; conflicting testing reports from WSSO and fitter; Waterguards may pass on work to someone else (wife etc)
Indicator 1.3 Information management	25	Central IPH knows # of CSP, but no performance information. Even WQ - #samples but not results
Indicator 1.4 Communication between service support authority and service providers	75	BRC supports VWSC; Fitter supports WG WSSO runs standard campaigns
Indicator 3.1 Client satisfaction	0	no feedback mechanism. Complaint register but only O+M,
Indicator	**Score**	**Definition & Explanation**
1. Degree of professionalization in the ESE		
1.1 Formality of the mandate for support	100	Existence of a formal mandate for support to service providers
1.2 Working methods	75	Number of standard tools and instruments for support applied in a structured manner
1.3 Information management	25	Existence and use of structured mechanisms for tracking information on performance of the service providers attended by the service support and monitoring authority
1.4 Communication between service support authority and service providers	75	Existence of structured mechanisms for communication with the service providers
2. Performance of the ESE		
2.1 Variety of support services being provided	4	Number of types of support services being on offer - maintenance support, HR support, financial support to pay WG

2.2 Response time	3	Average time that passes between a request for support and the support being provided - fitter will come in a few hours if WG requests help
2.3 Effectiveness		
2.3.1 Number of service providers that received support in the last year	1767	Number of service providers that recevied support in the last year
2.3.3. Number of the service providers that received support in the last year / total number of service providers to be attended	1	Number of the service providers that received support in the last year / total number of service providers to be attended
2.4.1	120	Number of systems attended in the last year – for one block

3 Community Service Provider Level

The success of the schemes in Himachal Pradesh is variable: two of the three CSPs deliver a high service to all households, whilst the third (Paddar) delivers a largely sub-standard service due to repeated and lengthy breakdowns. As part of the IPH-GIZ project formal Village Water and Sanitation Committees (VWSCs) were established, but this model has only been sustained in one village (Chahadi). In Kothi village an informal committee has superseded this with representation from all households within the village, whilst in Paddar the committee has not met since shortly after project completion, and the system is now managed on an ad-hoc basis.

Only Chahadi village collects a regular tariff which has contributed to modest reserves. The remaining villages collect contributions from community members only when needed to make repairs. In no village are any staff employed to maintain the system, with varying levels of volunteerism being relied upon for the limited operation and maintenance required of the gravity flow systems. Whilst Chahadi and Kothi manage on this basis, Paddar faces significant problems. This stems from the very long transmission pipeline, which is prone to frequent breakages. The very remote location of the village (with a highly dispersed population) and lower perceived wealth may be contributing factors which hinder the formation of effective coping mechanisms.

Initial support to the villages was provided through a project cell within the IPH set up to manage the WASH project, staffed by five members of engineering staff with technical and administrative support. GIZ staff provided oversight and technical support whilst IEC activity (Information, Education and Communication) was delivered through contracts with local NGOs. Although the initial support was intensive, and represented a significant financial component of the overall project, there is no on-going support beyond the provision of chemicals for water treatment. It was intended that the IPH would provide on-going technical support, but this was not formalised and has not taken place.

Table 5 Overview of community management

	Chahadi	Kothi	Paddar	*Pali*
1.3 Selection of the Board of the service provider	50	25	0	75
1.4 Information sharing and accountability mechanisms	No data	50	0	0
2.2 Cash reserves	100	0	0	0
2.3 Book keeping	75	No data	0	0
3.1 Technical folder	50	No data	0	25
3.2 Registry of operational information	50	No data	0	0
3.4 Water metering	0	N/A	N/a	0
3.5 Waters security measures	50	0	0	0
3.6 Water quality management	0	25	25	25

Although the WASH project was intended as a pilot for future implementation of community management this model has not been adopted, with the IPH following a much more limited form of community management with only simple tasks being transferred to communities. This model was in operation in the control village for this study, *Pali,* where it was seen to deliver a high level of service. Here the community employs a system operator, ('Jal Rakshak') who is responsible for the limited

operation required and the most minor maintenance tasks. No ownership or financial responsibility is transferred to communities, with the salary of the Jal Rakshak being paid by the IPH.

Capital costs were met from IPH-GIZ project, with communities paying a fixed 10% contribution to hardware costs which was repayable if they collected a tariff for six months following scheme commissioning (two of the villages achieved this). The cost of IPH staff in implementing the scheme is considered as CapEx software for consistency with other studies in this 20 case research programme. The limited OpEx is met entirely from the community with the exception of chemicals for water treatment, whilst there is no ongoing support (**Error! Reference source not found.**).

4 Household Service Levels

To validate the success of the water services provided in the villages studied, household surveys were conducted to assess the water service provided on five indicators: quantity, accessibility, quality, continuity and reliability. It was not possible to obtain water quality tests for this case study.

As the villages studied were typically small (as small as 35 households) the sample size has not always met the 30 households stipulated in the research methodology.

Chahadi

In Chahadi 18 households were surveyed, of which 11 used the community managed supply. Those residents of Chahadi who use the VWSC managed gravity scheme enjoy an excellent service, which provides an essentially unlimited quantity of water which is perceived as high quality. All 24 households have household connections, and there are few reported breakdowns: the majority (nine) of respondents reported no breakdowns. This is plausible due to proximity of the service reservoir to the settlement – any breaks in the pipeline which can be fixed quickly will not lead to an interruption to the service. It was indicated by some respondents that in exceptionally dry summers, the VWSC may restrict the supply of water to two periods per day, but that this had not been the case for several years.

Table 6 Service levels for Chahadi (n=11)

Service Level	Quantity	Accessibility	Quality	Continuity	Reliability
High	100%	100%	100%	100%	100%
Improved	0%	0%	0%	0%	0%
Basic	0%	0%	0%	0%	0%
sub-standard	0%	0%	0%	0%	0%
no service	0%	0%	0%	0%	0%
n/a	0%	0%	0%	0%	0%

The seven household surveyed that do not access the VWSC system use a mixture of IPH managed standposts (five) and household connections. The standposts provide a 24x7 service, whilst

household connections are limited to 30 minutes per day. All users complain of poor pressure, which contributes to longer filling times for household storage or water pots.

Paddar

All of the households surveyed in Paddar accessed the community managed supply. Due to the dispersed nature of the settlement, it was not possible to ascertain reliably what the legal boundaries of the village were, with conflicting accounts as to whether households were part of the village or not. Many of the households in Paddar accessed shared connections: that is where an extended family may occupy several households clustered together, but sharing a single yard connection. This has been treated as a household connection as, although water is collected in pots for drinking and cooking, the majority of domestic use (bathing, laundry, washing) is done at the tap. Treating this as a standpost would underestimate the quantity of water used, when there is no functional difference between this arrangement and a single household with a single external tap.

Table 7 Service levels for Paddar (n=18)

Service Level	Quantity	Accessibility	Quality	Continuity	Reliability
High	100%	100%	94%	100%	0%
Improved	0%	0%	0%	0%	22%
Basic	0%	0%	0%	0%	0%
sub-standard	0%	0%	6%	0%	72%
no service	0%	0%	0%	0%	6%
n/a	0%	0%	0%	0%	0%

Although the service levels appear excellent, this presents a somewhat misleading picture: the poor reliability dominates users experience and perception of the service provided. Although the reported number of breakdowns is highly susceptible to perception of individual respondents, all bar four reported a number which was sub-standard or no service. The average number of reported breakdowns was 14, with seven respondents reporting 20 or more breakdowns in one year. It is reported that each breakdown typically takes 2-3 days to be fixed.

This poor reliability is largely a function of the long supply line from the spring box (over 7km distant), but also reflects the lack of any on-going routine maintenance by the community.

Kothi

All the households surveyed in Kothi used the community managed supply. There was some difficulty in conducting the survey due to many of the households spending the majority of the day working in fields, some distance from the settlement. As in Chahadi this is an excellent service, with no households reporting any of the indicators as being less than high. The 17 per cent of households with a reliability of “n/a” is due to incomplete data on the number of breakdowns in one year.

Table 8 Service levels for Kothi (n=24)

Service Level	Quantity	Accessibility	Quality	Continuity	Reliability
High	100%	100%	100%	100%	83%

Improved	0%	0%	0%	0%	0%
Basic	0%	0%	0%	0%	0%
sub-standard	0%	0%	0%	0%	0%
no service	0%	0%	0%	0%	0%
n/a	0%	0%	0%	0%	17%

Although no data was collected on households using other sources, they are reported as using an older IPH household connection system. The level of service provided by this system is not known.

Pali

All households surveyed in *Pali* used the IPH system – a reflection of coverage in the village. The majority have access to a household connection with only two households using public standposts. The service is generally very high, with only those households accessing water from standposts accessing less than a basic quantity of water. The majority of households receive a 24x7 supply, although some only receive supply for three hours each day. It is not clear if this is due to the location of the households in the village, or a reflection of the survey being conducted during the summer period.

Table 9 Service levels for *Pali* (n=30)

Service Level	Quantity	Accessibility	Quality	Continuity	Reliability
High	90%	93%	100%	77%	93%
Improved	0%	0%	0%	23%	3%
Basic	3%	0%	0%	0%	0%
sub-standard	3%	0%	0%	0%	0%
no service	0%	0%	0%	0%	0%
n/a	3%	7%	0%	0%	3%

Reliability is generally high: differences in interviewing technique led to inconsistent answers in the number of breakdowns (an average of less than one for half the households, and of over nice for the remaining 15), but response times were consistently low – with an average of less than four hours. Some respondents commented that they were unaware of breakdowns because household storage ensured continuity of supply.

4.1 Community and household views

Respondents to the household survey were asked what their satisfaction with the service they used was. As seen in **Error! Not a valid bookmark self-reference.**10, in Chahadi, Kothi and *Pali* the majority of respondents are very happy with the service received. In Chahadi and Kothi, all respondents who use the community managed supply are very satisfied with the service. In Chahadi, households which use a IPH source were all less than very satisfied – citing poor pressure and the lack of universal household connections as the reasons for this.

Table 10 User satisfaction levels in the villages surveyed

	Very satisfied		Somewhat satisfied		Not Satisfied	
Village	Summer	Non-Summer	Summer	Non-Summer	Summer	Non-Summer

Chahadi	11	11	6	6	1	1
Paddar	7	7	10	10	1	1
Kothi	24	24	0	0	0	0
Pali	29	29	1	1	0	0

In Paddar household satisfaction rates are much lower, with poor reliability being the biggest factor behind this. The fact that some respondents reported being very satisfied with the service despite the poor reliability may reflect the value attached to having access to a household connection, despite the limitations of the service. Several respondents replied that the scheme should be handed over the IPH to help improve maintenance. It was unclear if the respondents were aware that IPH connections are paid for, and if they were able or willing to meet the tariff.

In addition to the household surveys, village meetings were held in each village to facilitate a discussion on the water service. Although not a structured focus group this provided opportunity for wide-ranging feedback. Due to the small size of the villages these often included VWSC members and non-members, but efforts were made to ensure feedback from a broad cross section of the community.

In Chahadi and Kothi there was widespread support for the system and the manner in which it was operated and maintained. Although the villages had followed different models in terms of running the systems, this had been achieved through widespread consensus in both cases. For example, in Kothi there was a INR 10 fine for any family not attending the VWSC meeting, but this was accepted by everyone. In Chahadi there was some dissatisfaction with the role of GIZ, in particular that it had taken considerable time to reclaim the money owed to village for collecting a tariff.

One common factor in these villages was the outright refusal of the communities to countenance additional connections for new settlers. There was a strong feeling that only those families (and their descendants) who contributed to the construction of the system had any right to use it. Suggesting otherwise brought a vehement response in both villages.

In Paddar it was not possible to conduct a single meeting due to the disparate nature of the settlement. However, in various discussions with villagers it became apparent that there was deep dissatisfaction with the system. People did not feel capable of maintaining the system, with a sense of being overwhelmed by the responsibility. There were numerous calls for the IPH to take over the system (perhaps prompted by the research team being accompanied by IPH staff). It was also felt that there was no point in charging a tariff as the amount collected would not be sufficient to employ anybody to maintain the system.

Table 11 Service levels for three best practice villages in Himachal Pradesh

	Quantity	Accessibility	Quality	Continuity	Reliability	Overall
high	**100%**	**100%**	**98%**	**100%**	**58%**	**66%**
improved	**0%**	**0%**	**0%**	**0%**	**8%**	**8%**
basic	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
sub-standard	**0%**	**0%**	**2%**	**0%**	**25%**	**25%**
no service	**0%**	**0%**	**0%**	**0%**	**2%**	**2%**

n/a	0%	0%	0%	0%	8%	0%

In *Pali*, the meeting supported the responses to the household surveys with regards to the perception of the service. This meeting was dominated by women (in contributions more than in number) who felt strongly that the service was important to allow them to pursue other economic activity. There was no evidence of a desire to gain greater control of the water supply, partly due to a feeling that as the system was working well, there was no need for change, but also because it was felt strongly that water supply was the responsibility of the state. One person commented that it would be 'impossible' to operate without the role of the IPH, as the IPH contributed materials for the system, plus skilled labour.

5 Costing

This section examines the capital and recurrent costs for the water supply systems in best practice and control villages. For the GIZ project, much of the costing data has been gathered from a GIZ cost analysis and compared with data gathered directly from communities. As this was a pilot project, the project management costs were a significant component of the total costs, and included expenditure (such as exposure visits for IPH staff to Germany) which did not directly contribute to implementing the water supply schemes. To maintain comparability with other Community Water plus case studies these costs have been stripped out.

5.1 Capital costs

Table 12 Capital costs for water supply systems in all villages

Village	Chahadi	Kothi	Paddar	*Pali*
population (2011 census)	363	218	283	233
Date of construction	2008	2008	2008	1992
CapEx HW	INR 372,351	INR 313,156	INR 766,556	INR 496,000
Community Contribution	INR 37,235	INR 32,500	INR 76,504	INR 0
CapEx SW (workshops etc)	INR 206,205	INR 206,205	INR 206,205	INR 4,000
CapEx SW (staff costs)	INR 1,405,523	INR 1,405,523	INR 1,405,523	
Total SW	INR 1,611,728	INR 1,611,728	INR 1,611,728	INR 4,000
Enhancement/Expansion	Enhancement	N	N	N
Year	2013	-	-	-
Activity	New source for additional dwellings	-	-	-
Cost	INR 15,000	-	-	-
Source	INR 12,000 from beneficiaries and balance from reserves	-	-	-

In the best practice villages, direct capital costs were met by GIZ: this included the construction cost of the systems and the cost of contracting local NGOs to run workshops and other training provision to communities. This does not include the costs of employing any international staff or consultants.

The gravity fed systems built through the GIZ project built upon and expanded existed systems, utilising and refurbishing existing structures including spring boxes and transmission pipelines. It was not possible to estimate what proportion of the systems were constructed by the GIZ project, and no data existed on the cost of pre-existing infrastructure. The construction cost presented above

includes only the expenditure of the GIZ project, even though it must be recognised that this is an underestimate of the total cost of construction.

Direct software costs included contracting local NGOs to run IEC and training activities as detailed below. All funding for this came via GIZ.

Although not accounted for in the GIZ cost analysis, a significant component of the support was the staffing support of the IPH – this included five engineering staff for the duration of the project. In keeping with the GIZ cost analysis, the cost of these staff has been included only for the period 1st June 2007 to 31st December, 2008 as this is when the majority of implementation takes place. This excludes earlier work on planning and village selection, but also means it is possible to assume with a degree of certainty that all the staff time of the IPH was directed towards scheme implementation, rather than wider objectives.

The only best practice village which had any record of capital maintenance expenditure was Chahadi which constructed an additional source to serve growing families and new dwellings. This was met from a mixture of direct contributions by beneficiaries and general reserves. For the remaining villages no records of capital maintenance were available. For the best practice villages this is reasonable given the scheme age, but for *Pali* it would be expected that some capital maintenance has been needed over its 23 year life.

Chahadi has identified several items of future capital maintenance expenditure: a new service reservoir at a higher elevation, to better serve some households which currently receive a supply directly from the transmission pipeline (estimated at INR 10,000), and a new, larger transmission pipeline (INR 2,00,000). Although some of the cost of this could be met from existing reserves, the village is seeking external funding (possible via the IPH) before committing its own funds.

5.2 Recurrent costs & revenue – Opex: hardware & software

Accurate recurrent costs for the best practice villages were difficult to obtain due to the informal nature of the operation, extensive use of volunteer labour, and the technologically simple nature of the systems. Even where there were frequent breakdowns (such as Paddar) it appeared that the maintenance work required significant volunteer labour, but more limited materials (e.g. repairing damaged pipeline or blocked spring boxes). The only material need of the system is bleaching powder, which is provided free of charge on an annual basis by the IPH (although the community has to arrange transportation). Up to date financial records were available in Chahadi village, but it was not possible to meet the treasurer in Kothi, and Paddar did not appear to have any records. What data is available has been collated in Table 13.

Only Chahadi collected a regular tariff, continuing the INR 10 / month stipulated at the outset of the project, or a total of INR 240 / month. This appeared to mostly contribute to reserves, which stood at INR 75,000 as of June 2015, with very limited expenditure on recurrent costs.

Kothi and Paddar both collect contributions from the community only when needed to make repairs. Although data was collected on the estimated number of breakdowns, and the amount of any contribution for repairs through the household surveys, it has not been possible to calculate a reliable estimate of the income from this source: multiplying the average reported contribution by

the reported number of breakdowns in a year gives an unrealistically high estimate (INR 1,200 and 5,600 respectively) when compared to the known income in Chahadi. Any attempt to reach a more reasonable estimate, such as assuming on a certain percentage of breakdowns require payment, would require arbitrary assumptions with no supporting evidence.

Table 13 Summary of recurrent costs for best practice villages

Item	Chahadi	Kothi	Paddar
Tariff/hh/month	INR 10	-	-
Estimated Tariff Collected (monthly)	INR 240	-	-
Average reported contribution to repair costs (one time)	-	INR 20	INR 80
Reserves (as of June 2015)	INR 75,000	n/a	-
Provision of chemicals by IPH (annual)	INR 750	INR 750	INR 750

Other than the provision of bleaching powder, there is no on-going support for the CSPs: whether, financial, training, monitoring or provision of services.

The control village, *Pali,* provides an interesting comparison: although the IPH collects a regular tariff, INR 26/household/month, it also meets all the costs of running the system which significantly exceed the tariff collected. This comprises mostly staffing costs (including the Jal Rakshak, maintenance staff and the Block Resource Cooordinator), with no information available on materials expenditure. An overview of recurrent costs is provided in Table 14.

Table 14 Direct recurrent costs for *Pali* village.

Item	*Pali*
Tariff	INR 26/hh/month
Estimated total tariff collected	INR 1,768
Electricity	-
Jal Rakshak	INR 1,350
Chemicals	INR 62
Maintenance	-
Reserves	n/a
Maintenance staffing support	INR 9,042
Total monthly costs	INR 10,454
IPH contribution	INR 8,686

The largest cost is the salaries of maintenance staff: this has been calculated from the salaries of those staff directly involved in maintenance (fitters and work supervisors) and the number of villages they are responsible for. As the Jal Rakshak has limited maintenance responsibilities, nearly all repairs require the attendance of IPH staff.

The community development support is provided from the Block Resource co-ordinator, who is employed by the WSSO, through a local NGO. One BRC covers 120 villages, at a cost per village of INR 78.

The Summary Cost Tables, below, focus only on the costs of the three 'successful' INGO supported community managed villages though it would appear that in this case the control village with its clear community management *plus* approach was is actually more successful, both in water supply and in sustainability.

Table 15 Summary Cost Table (INR)

Himachal Pradesh Summary Cost Table - calculated as the average cost per person, that is averaging across the 3 '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 64	-	INR 64	INR 100	-	-	-	INR 4	INR 103
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	-	INR 2,262	INR 2,262	INR 3	-	-	-	-	INR 3
National Government	-	-	-	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	INR 2,166	INR 1,371	INR 3,537	-	-	-	-	-	-
TOTALS	INR 2,230	INR 3,633	INR 5,863	INR 102	-	-	-	INR 4	INR 106
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	97%	100%	99%	3%	-	-	-	0%	3%
Median of 20 case studies			95%						57%

Notes: Expenditure does not include costs of international staff and higher-level state staff for pilot projects with low number of villages; CapEx for initial systems in best practice villages not available and not accounted for

Table 16 Summary Cost Table (PPP USD$)

Himachal Pradesh Summary Cost Table - calculated as the average cost per person, that is averaging across the 3 '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	$ 3.66	-	$ 3.66	$ 5.69	-	-	-	$ 0.21	$ 5.90
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	-	$ 128.93	$ 128.93	$ 0.15	-	-	-	-	$ 0.15
National Government	-	-	-	-	-	-	-	-	-
NGO national & international	-	-	-	-	-	-	-	-	-
International donor	$ 123.45	$ 78.13	$ 201.58	-	-	-	-	-	-
TOTALS	$ 127.11	$ 207.06	$ 334.18	$ 5.84	-	-	-	$ 0.21	$ 6.05
Median of 20 case studies			$ 184.16						$ 11.78
'Plus' %age	97%	100%	99%	3%	-	-	-	0%	3%
Median of 20 case studies			95%						57%

Notes: Expenditure does not include costs of international staff and higher-level state staff for pilot projects with low number of villages; CapEx for initial systems in best practice villages not available and not accounted for

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

6 Conclusions

In Himachal Pradesh there is little on-going support to the INGO initially-supported 'community managed' water supply, but systems are relatively successful due to the simple technology which requires limited maintenance and has negligible running costs. Cohesive communities enable this voluntarist approach to managing and operating the water systems.

Where there is little or no on-going support community management can still be successful, but this success is fragile. It can be described as existing in a state of unstable equilibrium: the service will continue to be delivered at a reasonable level until the point when it is subject to external influence (e.g. the poor yield of a borehole, or frequent damage to the system as a result of landslides, tree-falling or bears. If this external factor is beyond the coping capacity of the community, then the service level is likely to decrease and is unlikely to improve without external support. This then becomes a new, lower, state of equilibrium. This mode of, limited, success is heavily dependent on voluntary inputs by the community, and is most likely to succeed only in small, cohesive communities.

References

Census of India (2011) Himachal Pradesh Population Census data 2011. Available at: http://www.census2011.co.in/census/state/himachal+pradesh.html (Accessed: 28 August 2015).

Department of Drinking Water Supply (2003) Swajaldhara Guidelines, Government of India, New Delhi

GIZ, 2009, PRI Project Annual Report,

Lockwood H. and S. Smits. 2011. *Supporting Rural Water Supply: Moving towards a Service Delivery Approach*. Rugby, UK: Practical Action Publishing

Smits, S., Franceys, R., Mekala, S. and Hutchings P., 2015 "Understanding the resource implications of the 'plus' in community management of rural water supply systems in India: concepts and research methodology",. Community Water Plus working paper. Cranfield University and IRC: The Netherlands