COMMUNITY MANAGEMENT OF RURAL WATER SUPPLY

Community Water *plus*

Xavier Institute of Social Service, Ranchi

Understanding the resource implications of the 'plus' in community management of rural water supply systems in India: Vikas' approach in Odisha

Gram Vikas, Bhubaneswar, Odisha

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July 2015

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

Executive summary

This study investigates support given to community service providers in Odisha by Gram Vikas, an internationally acclaimed NGO, and assesses the level of service achieved through this arrangement. Consumers in the best practice villages were found to receive high levels of service and to be very satisfied, confirming the effectiveness of service provision.

The study found that water committees manage the schemes effectively and that there is a high degree of community participation throughout the service delivery cycle. Service providers could further increase professionalisation through regular water quality testing and external auditing of accounts. Tariffs in best practice villages cover recurring costs, including electricity, and are set in cooperation with the community, respecting local preferences.

Gram Vikas was found to give intensive support and capacity building prior to scheme implementation, leading to rather independent service providers. After the initial handholding, support is mostly given on request, which seems to work effectively, because of the good communication channels and quick response by Gram Vikas. The institutional assessment showed very high scores for the enabling support organisation, especially on the leadership and community orientation indicator.

Costs for supporting service providers by Gram Vikas were estimated at INR 33 per person per year for direct support (though none such support received during the research study period in the selected villages) and INR 9 per person per year for indirect support. Initial capacity building and mobilisation was found to cost INR 81 per person, which is about 3% of the capital costs for infrastructure implementation. This is a comparatively high percentage and shows the emphasis put on work with communities before construction starts.

Three key aspects of this case study are given below:

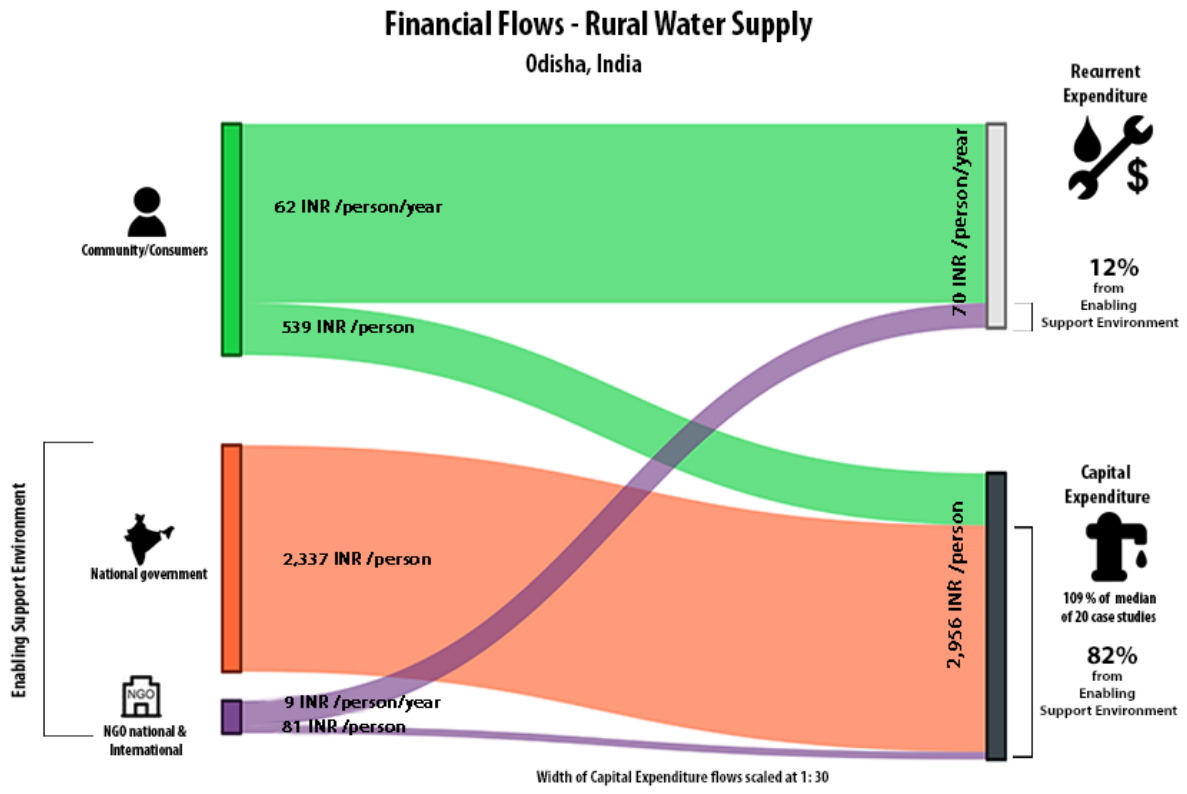
- Gram Vikas believes in high quality solutions that should be 'cost effective' rather than 'low-cost'. Toilets and separate bathrooms are constructed, as well as three taps in each house, one each for the kitchen, bathroom and toilet. The aim is to provide water for 24 hours a day in all villages. This in turn leads to a high willingness to pay and a sense of ownership and pride.
- There is a high commitment threshold for the programme. Every single household in the community has to agree to participate before it starts. Full coverage with toilets needs to be achieved before any work on water supply starts, with households contributing around 50% of the costs for toilet construction. Households contribute INR 1,000 to a capital reserve fund to pay for extensions and maintain 100% coverage with household connections
- Schemes are intentionally kept simple and operational manuals and designs are 'de-mystified', which means that explanations are given in a language that is easy to understand without technical knowledge.

Community Water *plus*

Odisha 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	539		-	INR	539	INR	32	INR	29	-		-		-		INR	62
Local self-government		-		-		-		-		-	-		-		-			-
		-		-		-		-		-	-		-		-			-
State government entity		-		-		-		-		-	-		-		-			-
State water supply agency		-		-		-		-		-	-		-		-			-
National Government	INR	2,337		-	INR	2,337		-		-	-		-		-			-
NGO national & international		-	INR	81	INR	81		-		-	-		INR	9	-		INR	9
International donor		-		-		-		-		-	-		-		-			-
TOTALS	INR	2,875	INR	81	INR	2,956	INR	32	INR	29	-		INR	9	-		INR	70
Median of 20 case studies					INR	3,231											INR	207
'Plus' %age		81%		100%		82%		0%		0%	-			100%	-			12%
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.

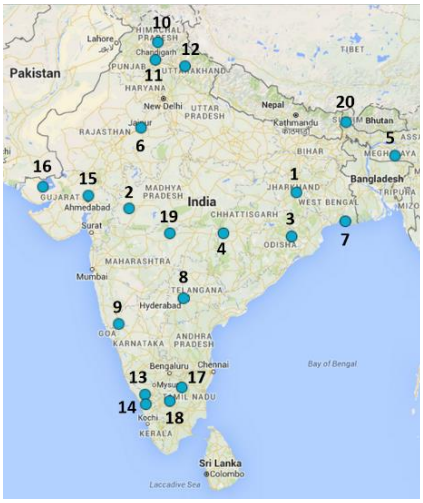


Acknowledgements

This case study research was led by Mr. Prakash C. Dash and Dr. Pramil K. Panda and was assisted by Mr. Ashok Kandhera and Mr. Suresh Sahu. Matthias Javorszky, Cranfield University, also supported this case study through a follow-up research visit and contributed to the data cleaning, analysis and write-up. Dr Snehalatha Mekala was the national research coordinator.

We wish to put on record our sincere gratitude to the officials and staff of Gram Vikas for their cooperation and support in undertaking this case study. We thank all VWSC members in the four study villages for extending their cooperation and contributing their valuable time during the interviews and focus group discussions. Finally, we also would like to appreciate all the sample households for providing information during the household survey.

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



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

The twenty case studies 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.

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List of acronyms

GV	Gram Vikas
RWSS	Department for Rural Water Supply and Sanitation
VWSC	Village Water and Sanitation Committee
ESE	Enabling Support Environment
CSP	Community Service Provider

1 Introduction

This report is a part of the Community Water plus series of case studies on community-managed rural water supply in India. It investigates the support provided by Gram Vikas, a non-governmental organisation (NGO), to Village Water and Sanitation Committees in Odisha that manage piped water supply systems for providing drinking water to villagers. This report describes this support arrangement in detail, and assesses the effects of the support in terms of service delivery. It also provides an estimation of the costs involved in this support.

1.1 Background to the topic and the Community WaterPlus 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 pipe water supply systems in different parts of Odisha. The Village Water and Sanitation Committees (VWSC) that manage these systems are supported by Gram Vikas, a non-governmental organisation with a head office in Bhubaneswar, the capital of the State. This report investigates both the support provided and the service providers' performance.

1.3 Structure of the Report

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

2 Concepts and methodology

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

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

Ultimately, we believe that for successful community management, proper support is needed to deliver water services that are: *effective* in terms of quantity, accessibility, quality and reliability; *equitable* in that all rural households can access services irrespective of gender or social status, indeed that there is a bias towards the poorest who most benefit from good public health provision; sustainable or *viable*, in that there are adequate resources available, from whoever, to ensure the continuation of the service; *efficient* such that the minimum resources are used to deliver the desire quality of outputs; and *replicable* such that approaches can work at scale across different localities, not being dependent upon particular situations or leaders.

2.1 Methodology

The focus of this research is thus to investigate successful cases of community-managed rural water supplies, and in that assess the type and size of support that has been deployed to make it successful. What can be considered successful can be understood at various levels: at the level of service that users receive, at the level of the service provider carrying out its tasks with a certain degree of community engagement, and at the level of partnership between the support entities and the service provider. The research will therefore assess the degrees of success across various elements, as summarised in Figure 1 below, and further elaborated below.

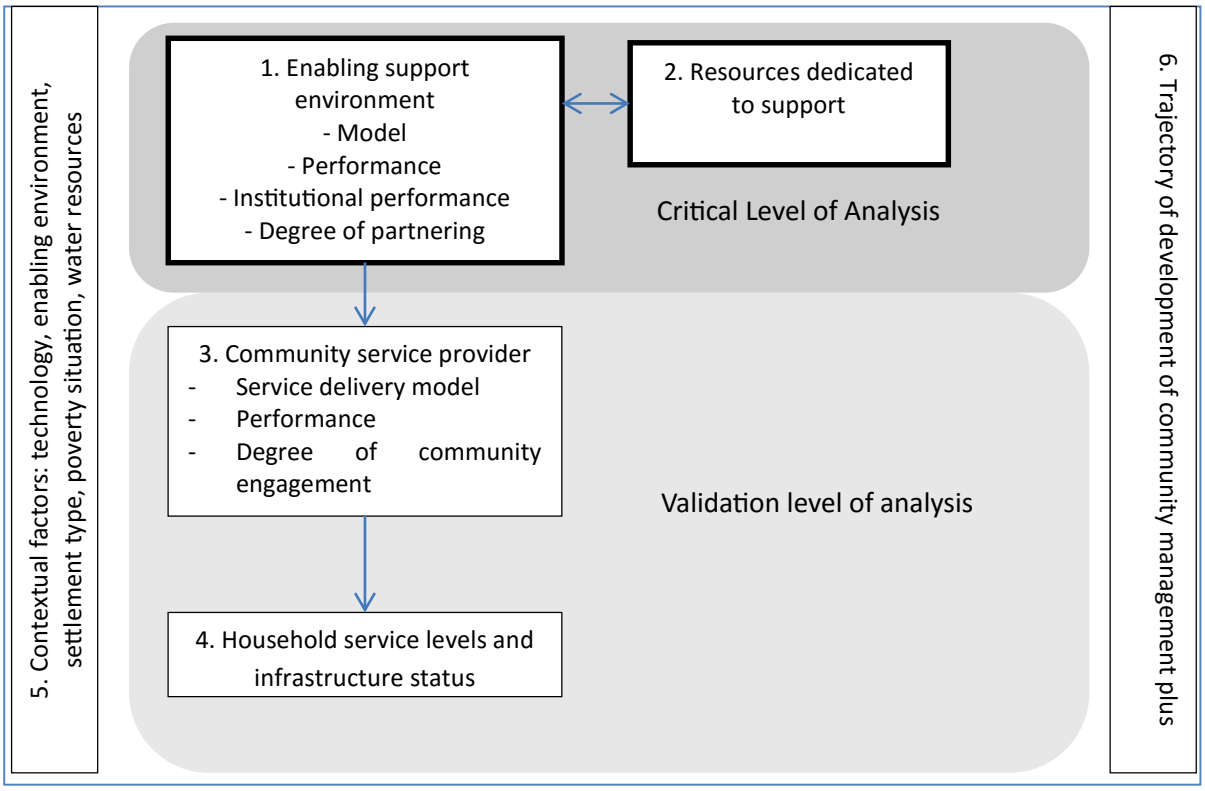

Figure 1: Elements of the research

2.1.1 Case study selection

In selecting twenty reportedly successful case studies, the research has scanned over 161 community-managed rural water supply programmes in India, covering a combined population of nearly 50 million people. Through a detailed process of selection using both secondary data and pilot visits, 20 programmes were chosen to become case studies.

The research aimed at covering programmes from a wide range of socio-economical, political and environmental conditions found in India and investigate the levels of (relative) success achieved. Odisha is one of the poorest states in India, with a state GDP per capita of USD (PPP) 2,998, and is the second-least developed states in India, according the human development index (Government of India, 2011). It was therefore selected as a case study to investigate the success possible under these challenging conditions and to show what 'best practice' looks like in this context.

In Odisha, the government body responsible for rural water supply is the Rural Development Department of the Government of Odisha, specifically its subdivision for Rural Water Supply and Sanitation (RWSS). Its aim is to provide potable and sustainable drinking water and sanitation facilities to all rural residents. The non-governmental organisation Gram Vikas (GV) helps in implementing piped water supply schemes in villages through community empowerment and capacity building. GV is widely acclaimed at national and international levels and often cited as a case study for grassroots development. Many letters of the government recognise GV's role in rural water supply in the State and especially its role in providing beneficiary communities with full coverage with toilet facilities. GV and its founder Joe Madiath have won numerous national and international awards, for example the World Habitat Award by UN Habitat in 2003, the Kyoto World Water Grand Prize in 2006 and the Ashoka Changemakers Innovation Award.

It was therefore decided to study three 'best practice' villages that were supported by GV and a control village that did not receive this support. Therefore, GV is seen as the ESE for best practice villages, RWSS as the ESE for the control village. In both set-ups, a Village Water and Sanitation Committee (VWSC) was formed to manage the scheme, which acts as the community service provider.

Four villages from across Odisha have been selected for inclusion in the study. Successful villages were identified using the following criteria: the water supply system should be run by the community, a substantial number of households should be covered by piped water supply and the service provider should collect user charges for household connections. Since GV is considered as the ESE for the best practice villages, all 27 districts of Odisha where it has implemented its drinking water and sanitation programme were considered as the area of study but it was decided to select 3 villages from 3 different categories of the districts as follows:

- Category 1: Districts where GV has worked in more than 100 villages (Total – 3)
- Category 2: Districts where GV has worked in 51 to 100 villages (Total – 5)
- Category 3: Districts where GV has worked in 11 to 50 villages (Total – 5)

Besides, only those villages where the programme has been implemented more than 5 years ago were selected. Based on the described criteria, the following best practice villages were selected: **Kanamana** from category 1 in Ganjam district, **Lambrupali** from category 2 in Bargarh district and **Lakhanpur** from category 3 in Jharsuguda district.

Finding a village with a functional water supply scheme under the RWSS setup was a challenge, as most villages do not fit the criteria described above. The control village, *Tinkbir* can be seen as one of the highest-performing villages under RWSS, and was selected for comparison against the best practice villages, as it has not received support from Gram Vikas. However, this village should not be

seen as representative of most other schemes under the government set-up, as their performance is mostly far lower.

2.1.2 Data collection and analysis

Information on the four units of analysis was gathered from both primary and secondary data, and through a field visit from 2 November to 17 September 2014. This was complimented through a follow-up visit from 12 June to 17 June 2015.

A number of key informant interviews, focus group discussions and informal interviews were conducted at the support organisations, the service providers and with households. In addition, 120 household surveys were conducted to assess service levels, 30 in each village.

The data were processed in 4 databases (one for each of the units of analysis). These databases contain scoring tables for amongst other 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 have been converted to 2014 prices. Inflation has been calculated using the construction price index for hardware costs and the consumer price index for other costs, as available from the Reserve Bank of India. Prices in this report have been reported in INR only but the US dollar basic conversion rate should be read at the 2014 average of $63.2 to INR 100.

3 Enabling Environment Level

This section focuses on the Enabling Support Environment (ESE), which is GV for the best practice villages and RWSS for the control village, at the direct support level. First, we give an overview of the organisations, the support they provide and an assessment of which actor is responsible for what throughout the service delivery cycle. This is followed by a closer assessment of the ESEs' performance and its partnering with the service providers it supports.

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

3.1.1 History of Gram Vikas

Gram Vikas (literally translated as 'village development') stated with a group of student volunteers of the Young Students Movement for Development (YSMD) from Chennai coming to Odisha after a cyclone hit the state in 1971 and left more than one million homeless. They soon moved away from disaster relief and started working with tribal communities and issues such as livelihoods, healthcare and rural indebtedness. In 1979, the group decided that they had little in common with the YSMD in Chennai and decided to form their own organisation, thus Gram Vikas was born. The organisation was heavily involved in the promotion of biogas in the 1980s and from 1983 to 1993 constructed 80% of all biogas plants in Odisha, emphasising community involvement and capacity building.

These decades of work established trust among communities and enabled Gram Vikas to expand its work to other aspects of people's lives. Water and sanitation related ailments were found to be amongst the main causes of ill health and low economic standards in rural Odisha. Therefore water and sanitation became the entry point for GV's new development programmes, first the Rural Health and Environment Programme running from 1992 to 2004 and the current 'integrated habitat development programme' called Movement and Action Network for Transformation in Rural Areas (MANTRA). In this programme, water and sanitation are used as an entry point to new settlements and not only acts as a vehicle to improved health but also as a way of fighting hierarchical caste and gender based exclusion. The initiation of Gram Vikas' interventions is contingent upon agreement and participation of 100% of the families in each village or habitation, ensuring that the benefits are shared equally among all, irrespective of sex, caste, creed or economic status. Once this agreement is reached, a bathing room and a toilet is constructed for every household with community contributions. People make bricks and collect rubble, sand and aggregates. Unskilled young boys and girls - whom Gram Vikas trains in masonry - construct toilets and bathing rooms. Only after every household is covered with these sanitation facilities, work on water supply starts. The communities bear about 60% of the capital costs of sanitation and up to 30% of the costs of establishing the piped water supply system. Besides contributing labour and materials, communities also make efforts to tap discretionary funds available with local elected representatives. Villagers identify sources to create an operations and maintenance fund, for example through improved pisciculture in erstwhile bathing ponds, community horticulture plantations and social forestry in the village common lands and regular household collections. In some villages, a percentage (0.25%-0.50%) of the harvest is contributed towards the common fund. This fund is used to meet their recurring expenses for electricity and salary of the pump operator to keep the water supply systems functional at all times

With the start of the Swajaldhara programme in 2002, by which the Government of India provides financing for community-managed water supply schemes, GV saw a chance of obtaining funds to scale up its operations across the state. GV became a facilitating agency for implementing Swajaldhara schemes, working with District Water and Sanitation Missions (DWSM) and Village Water and Sanitation Committees (VWSC) in the communities. The arrangement also allows for GV and the VWSC constructing schemes from their own funds and being reimbursed as funds become available, thereby speeding up the process. In the years from 2002 to 2008, GV successfully executed more than 200 Swajaldhara schemes in the State. In 2009, GV was awarded the status of a Project Implementing Agency (PIA) by the State Government. This means GV can be entrusted with work without tender and paid as per the schedule of rate, reducing bureaucracy and delays. Overall, GV cannot be seen as an agency working completely separately from the government, but as an organisation that helps deliver government programmes, as well as donor-funded projects, in a very effective manner through their own working mode. This close cooperation with both government and communities is possible because of the long experience of working in the area and the trust built by it.

3.1.2 Background of RWSS

Historically, the Public Health Engineering Organisation was responsible for providing water supplies to both urban and rural residents. In 1992, the organisation was split up and responsibility for rural water supplies was given to the Chief Engineer, Rural Water Supply and Sanitation Organisation (RWSS), acting under the administrative control of the Rural Development Department. RWSS implements central government programmes such as Swajaldara and the current National Rural Drinking Water Programme. Its aim is to provide sustainable, potable water supplies to all villages in the state, focusing on piped water supplies.

3.2 Enabling environment description

This section gives background information on the ESEs and their working mode. This is followed by a description of the support activities provided.

3.2.1 Gram Vikas

Gram Vikas, as a long-standing NGO has a clearly stated vision and mission, which are as follows:

Vision:
To build an equitable and sustainable society where people live in peace with dignity.

Mission:
To promote processes which are sustainable, socially inclusive and gender equitable to enable critical masses of poor and marginalized rural people or communities to achieve a dignified quality of life.

By GV's definition a dignified quality of life encompasses several factors, including community infrastructure, education, health services, livelihood and self-governing institutions. A critical mass is defined as groups of people who have developed democratic governance systems within their own communities and, building on this experience, develop strength to bargain with or influence their external environment. This shows that GV's mission goes far beyond just supplying water and sanitation infrastructure and aims at wide changes in society. However, water and sanitation is the first entry-point.

GV's work follows several key elements which are briefly explained below.

The all or none approach

All household heads (males and females) must agree to join the programme thereby ensuring participation by the whole community. Furthermore, water supply is used as an incentive to end open defecation. Water infrastructure is only built after every single household has constructed a toilet.

Financial sustainability

To ensure financial sustainability, each family is required to pay around 1000 INR into a 'corpus fund' (a restricted capital reserve fund), the interest of which is used for future expansion of the programme to new families so that 100% coverage of water supply and sanitation is maintained at all times. Future expansions in tank capacity or other major expenses are also met out of the interest from the corpus fund. The corpus fund itself, however, has to be maintained throughout as a capital reserve which maintains its principal. The community needs to cover at least 50% of CapEx for toilet and bathrooms and up to 30% of CapEx for water supply construction besides meeting the O&M costs.

Participatory self-management

The GV model aims at making communities self-sufficient to manage the schemes without depending on any external agency. To this end GV reduces its engagement after programme implementation. Even during the implementation phase, GV does not do all the work; its main role is that of a trainer. Later on it assumes the role of a facilitator, building the villagers' capacity to manage systems independently. Support is still provided years after implementation, but only on a request basis.

Cost effective, not low cost solutions

GV opposes the idea that rural communities require only low cost solutions. It believes that the history of short term low quality fixes to rural problems has dented villagers' self-esteem and led to infrastructure falling into disuse, as seen by for example by toilets used as storage sheds. GV therefore realised that a high quality toilet and three separate water taps, one each for kitchen, bathroom and toilet, are essential to ensure actual use. The idea is that cost-effective solutions are needed; low cost is an advantage but not a precondition.

Institutional set-up

The organogram of Gram Vikas is given in Figure 2. Each of the MANTRA junior managers are responsible for separate geographical areas and have junior engineers and supervisors working for them. Organisational and technical support is given by the other departments, which also provides a degree of oversight, although as one employee put it, "it is clear that the programme work is the core activity, and the support departments cannot override its practical needs".

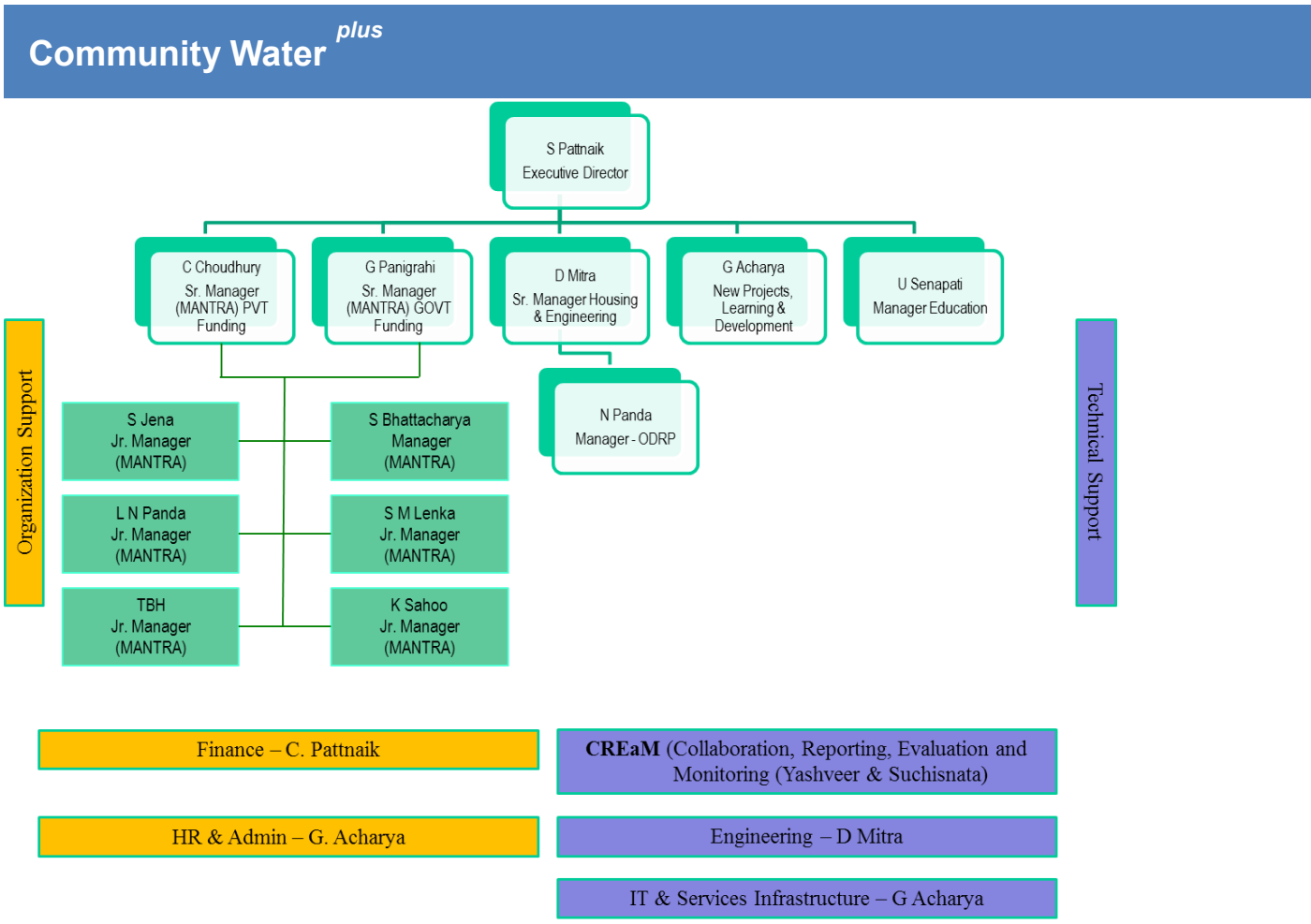

Figure 2: Organogram of Gram Vikas

In total, GV has 388 employees from diverse educational and professional backgrounds such as engineering, social work, business administration, management, rural development and social science. This diversity and balance between technical knowledge and more 'soft' skills is valued highly in the organisation.

GV provides a number of support activities, as shown in Table 1 below. Generally, GV operates in what can be called a 'front loaded' approach. Intense community mobilisation, capacity building and support before and during project implementation is given to enable the community to manage the system independently. There is a lot of support in the period immediately after implementation, but then gradually the communities are operating independently more and more, with GV only giving support on request when the need arises. This means that in some schemes the level of support received may seem low, as CSPs don't require support regularly. However, being able to access support is still very important, as GV responds to requests quickly and effectively.

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Table 1: Support provided by Gram Vikas

Type of activity	Is this type of activity undertaken by the ESE?	Modality of support	Frequency of support	Explanations and comments
Monitoring and control (auditing)	Yes	Both (On request and supply based)	1	First 1-2 years during and after construction very close monitoring and control, after that only functionality monitored
Water quality testing	Yes	Both (On request and supply based)	1	When source is developed and after construction testing. Regular testing for 2-3 years, after that only if there are complaints
Water resources management	No			In very few cases some activities regarding GW recharge, but not systematically
Technical assistance	Yes	On request		Assistance is given e.g. for bigger repairs, system expansion, new sources etc.
Conflict Management	Yes	On request		Rarely necessary (consensus in the system), but if there are conflicts, GV helps to resolve
Support in identifying investments needs	Yes	On request		GV provides support to communities in in identifying major investment needs such as additional water sources or reservoir extensions
(Re)training of service provider	Yes	Both (On request and supply based)	1	Intensive training at the beginning (training for leadership and management, but also technical skills such as masonry), afterwards only on request
Information and communication activities	Yes	Supply based		During implementation a lot of IEC, meetings, trainings, etc. Afterwards hardly any
Fund mobilization	Yes	Both (On request and supply based)		Funds from government, donors etc. for construction, but also from village sources such as pisciculture, horticulture or other sources. Also funds are mobilised for major expansions such as new wells, chlorinator devices

Table 2 depicts the activity and responsibility of various actors for tasks and activities relating to water supply in schemes under the GV setup.

Roles are defined as follows:

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

The table shows that funds for construction and initial training mostly come from government sources. Funds from government sources are also mobilised for capital maintenance and major extensions or renewals, such as augmenting schemes with a second water source. GV is responsible for planning and implementing the scheme, as well as for community mobilisation. The ongoing work with communities is done by GV as well, without financial support by the government. This can be seen as a risk for sustainability. As long as donor funds and overheads from new projects cover these costs, the model works. However, should this flow of funds stop, it is unclear how GV would finance the ongoing support; which is a problem all NGO-supported programmes face. The VWSC has a lot of responsibility in the ongoing operation and maintenance of the scheme. It should be noted that no external actor is responsible or involved in auditing. Accountability is provided directly by the VWSC to the community, which according to our interviews is sufficient due to the strong community participation. However, the lack of external oversight might lead to conflicts if there are disputes.

Table 2: Activity and responsibility matrix for Gram Vikas schemes

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

3.2.2 Department of Rural Water Supply and Sanitation

RWSS is responsible for implementing rural water supply schemes and supporting service providers in managing them. In 2007, the responsibility for operating and maintaining schemes at the village level has been transferred to the Gram Panchayats. To support them in operation, one RWSS Junior Engineer is seconded to each Block Development Office (BDO). However, the distinction between support provided by the RWSS engineer at BDO and by RWSS directly was not entirely clear in the studied village, therefore it was decided not to assess the BDO as a separate support entity, but to assess both as one ESE.

The organogram of RWSS is given in Figure 3. The control village, *Tinkbir*, belongs to the Debgarh district office, which supports 133 piped water schemes in total and has an annual budget of around 125,000,000 INR. No specific information on the vision, mission or staffing levels of RWSS was gathered as part of this research.

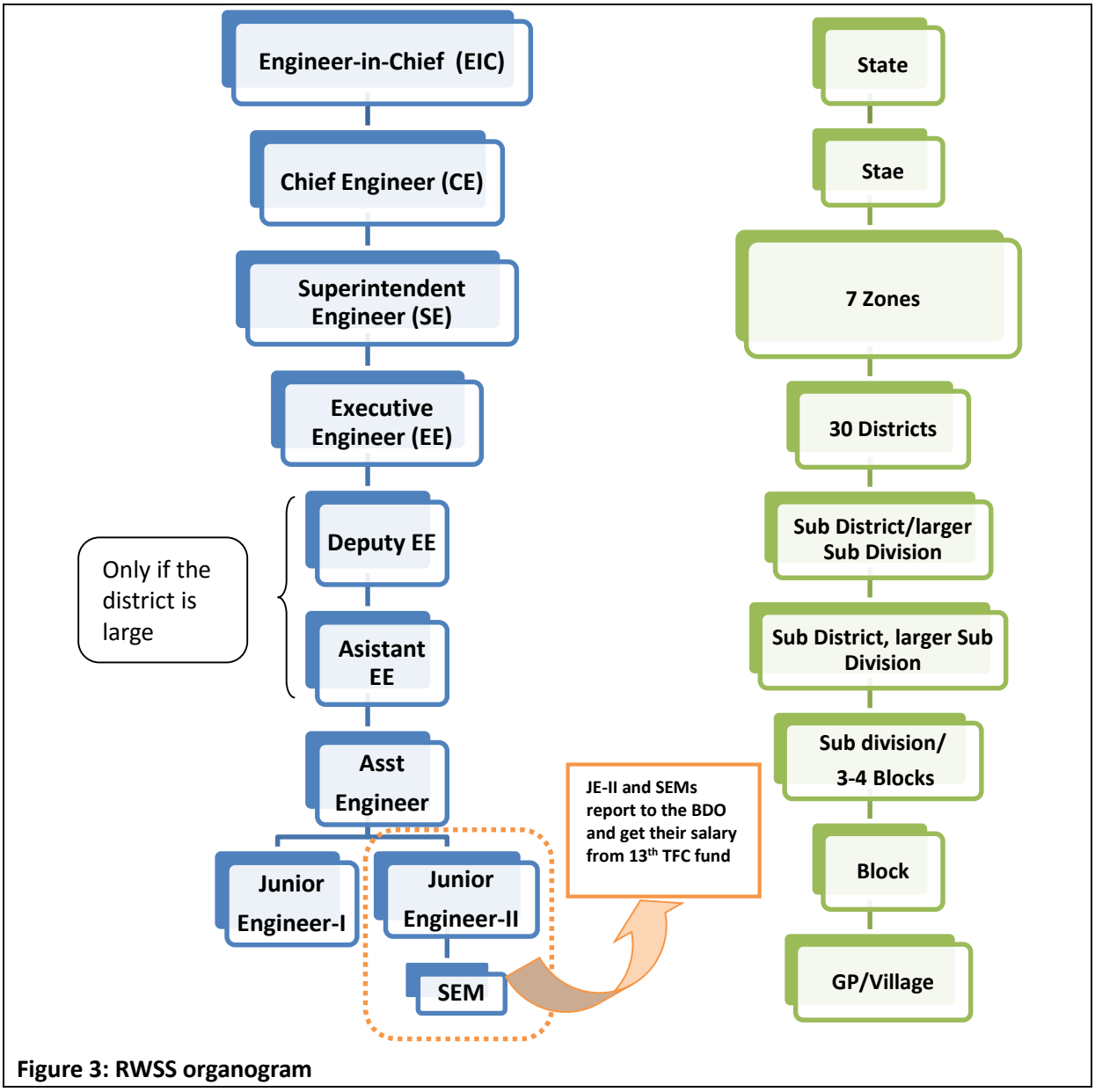

Figure 3: RWSS organogram

As shown in Table 3, a number of support activities are provided by RWSS. However, due to cooperation and communication issues they are not always conducted as they are supposed to. One example for this is information and communication activities. A comprehensive manual for VWSCs, detailing roles and responsibilities as well as templates for receipts and other materials, has been prepared and printed by the department. However, this manual has not been distributed to the Block Development Officers (BDO), who should distribute it to VWSCs. It was found that the BDO was not even aware of the existence of this manual. Gram Panchayats employ a self-employed mechanic (SEM) who is responsible for pump operation and minor repairs, and who should be trained by RWSS as well. However, no evidence of this training could be found in the studied village.

Community Water *plus*

Table 3: Support provided by RWSS

Type of activity	Is this type of activity undertaken by the ESE?	Modality of support	Frequency of support	Explanations and comments
Monitoring and control (auditing)	Partial	Supply based	1	Lack of coordination and lack of accountability of GPs and BDO, so activity does not happen as frequently as supposed to
Water quality testing	Partial	Supply based	2	Provision for pre-monsoon and post-monsoon. However, mostly done for tubewells and surface based schemes, borewells are usually not tested
Water resources management	No			
Technical assistance	Yes	On request		Support in initial stage, then for expansions, major repairs etc.
Conflict Management	No			Supposed to do, but not happening
Support in identifying investments needs	N/A			Schemes under NRWDP are completely government-supported, therefore community is not really involved in investments - no support
(Re)training of service provider	Partial	Supply based		Provision for training VWSC members and self-employed mechanic, however no evidence of it could be found
Information and communication activities	No			Very comprehensive handbook for VWSCs is available, but not distributed to BDOs or communities
Fund mobilization	Yes	Both (On request and supply based)		Funds for system construction, expansion, major maintenance and OpEx

Table 4 depicts the activity and responsibility of various actors for tasks and activities relating to water supply in the control village under the RWSS setup.

Roles are defined as follows:

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

Again, funds for construction and initial training mostly come from government sources. RWSS plays a major role in almost all activities. The VWSC is involved in many activities, although the level of partnering is significantly lower than in the GV scheme. During day-to-day operation the RWSS' role is quite active, as it pays the electricity bills and department engineers do routine maintenance. As in the best practice villages, no external actor is involved in auditing. This was not perceived to be an issue in the studied village, as the VWSC kept systematic accounts and opened them to users, but could lead to issues when this is not the case.

It has to be noted that the Gram Panchayat's (GP) role is very limited in the studied scheme. This is because in *Tinkbir*, the studied village, the VWSC is not part of the GP but an independent body. In other schemes under RWSS however the VWSC is a sub-committee of the GP, which would lead to a higher involvement of the GP.

Community Water *plus*

Table 4: Activity and responsibility matrix for the control village

Entities / Actors	Tasks / Activities																	
	Allocation of finance / Budgetary approval	Monitoring service levels & water quality	Project planning	Infrastructure design & implementation	Social intervention design and implementation	Operation and minor maintenance	Ongoing software support to community	Water resources management measures	Capital Maintenance and renewal	Major repair	Approval of user charges	User charge collection	Management of community involvement	Community capacity development & Training	Dispute resolution	Paying of water charges	Auditing	Evaluation/performance assessment
Central Government	PAY	INT		PAY	PAY			INT	PAY	PAY				PAY				INT
State Government entity)	RES + PAY	INT		PAY	PAY	PAY	PAY	INT	PAY	PAY				PAY				RES + PAY
RWSS/BDO	RES	RES + PAY	RES + PAY	RES + PAY	RES + PAY	RES	RES	RES	RES	RES	INT	INT	RES + PAY	RES + PAY	RES + PAY	INT		RES
Local government/ Gram Panchayat	INT		INV												INT			
Formal private enterprise (contractor)				RES														
Water committee	INT	INV	INV	INV	INV	RES			RES + PAY	RES + PAY	RES	RES + PAY	INV	INV	INV	RES	RES	INV
Other community organisations	INT		INT	INT														
Operator or mechanic				INV		RES	INV		INV	INV								
Households	INT	INT	INV	INT + PAY	INT	INT + PAY			INT + PAY	INT + PAY	INV	INT + PAY	INT	INT	INT	PAY	INV	INV

3.3 Enabling environment performance indicators

This section provides an assessment of the of the ESEs performance using different indicators, results of which are shown in Table 5. Scores are obtained using a QIS developed for this project and range from 0 to 100.

Table 5: ESE performance indicators

	Gram Vikas	RWSS
Formality of the mandate for support	100	100
Working methods	75	75
Information management	75	25
Communication between service support authority and service providers	100	25
Tracking client satisfaction	25	25

GV scores significantly higher on the information management and communication indicator. This is because compared to RWSS, they emphasise maintaining contact with the CSP and seeing their interventions as long-term programmes rather than projects that are finished after implementation. It has to be noted that the indicator for tracking client satisfaction seems low for GV, but this is due to the QIS calling for a systematic way of tracking clients' satisfaction for higher scores. GV does have a good understanding of its clients' satisfaction and their problems, but due to the close, informal contact between local supervisors and service providers, there are no systematic methods of tracking it, and according to GV, no need for it. However, satisfaction is high and steps are taken to address any concerns. Response times to requests are also significantly lower for GV, they aim to respond to request within 24 hours, while the RWSS policy states that requests should be handled within 7 days.

3.4 Enabling environment institutional assessment

The ESEs' institutional performance was assessed in more detail, using a number of questions for each parameter which are then averaged to a score from 1 to 4. From the results in Figure 4, it can be seen that both ESEs score highly on technical capacity, developing and maintaining staff and organisational autonomy. They both employ qualified staff and prepare technical solutions that are suitable to local conditions. Staff satisfaction is higher in GV, as people are very committed and have a strong sense of working together on the same mission. While RWSS is dominated by engineers, GV staff come from different backgrounds, leading to more diversity.

Similarly, on all other indicators, GV scores significantly higher. The difference is most marked in the indicators for leadership and community orientation. GV staff take great pride in their work and identify with the vision and goals of the organisation. They are very conscious of the organisation's history. Staff do not see water and sanitation as isolated issues or projects, but are committed to community empowerment and development and have this overall goal in mind. The RWSS staff on the other hand mostly see their work as something that has to be done, but don't greatly identify with it. In interviews with the BDO, employees mentioned that they saw the responsibility for water supply as a burden that adds to their already significant workload. Staff motivation is further damaged by people going on extended leaves and posts being vacant. As the RWSS is dominated by engineers, community interaction is not something that is emphasized. Staff tend to focus more on

the technical infrastructure than trying to get communities to participate or be involved in the project process.

Tables containing the detailed scores can be found in the Annex.

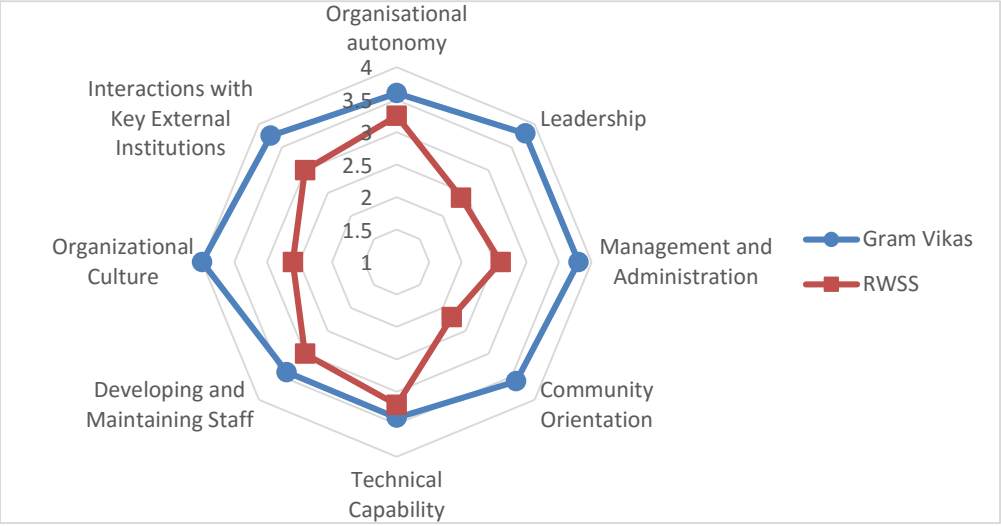

Figure 4: ESE institutional assessment

3.5 Enabling environment partnering assessment

An assessment was made on the types of partnering that are found between the ESE and CSP. This is done against six types of partnerships (Demirjian, 2002):

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

These types of partnering do not imply any hierarchy and a partnership may have elements of all these six types of partnering. Partnering is assessed in the four phase of service delivery and assigned a score from 1 to 4. In each phase, the partnership can show characteristics of all partnership types. Results are shown in Figure 5 and discussed below. The tables containing the original scoring can be found in the Annex.

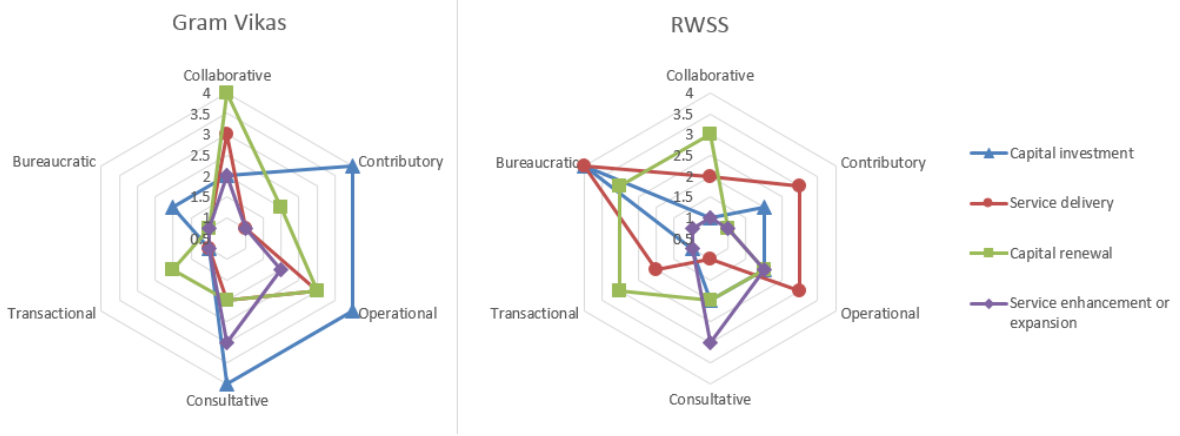

Figure 5: ESE partnering assessment

The two direct ESEs show very different forms of partnering. As discussed above, GV places great emphasis on mobilising the entire community and ensuring participation of every single household before construction of a water supply project starts. Therefore, the level of partnering in the capital investment is very high, with full scores on the more interactive types of partnering. However, the programme has some non-negotiable aspects, such as providing three taps in each household, which means the community cannot influence the overall project design, leading to the low score for collaborative partnering. The partnering for the service delivery phase seems low, which is a direct result of the intensive preparatory work by GV before construction. This leads to an empowered and competent VWSC, which does not require a lot of assistance in the operation of the scheme. GV does not need to provide any financial support towards O&M, as tariffs cover regular expenses. However, if problems arise, GV gives effective and timely support on a request basis. The situation in the service expansion phase is similar. Before the scheme is constructed, the corpus (capital reserve) fund is set up with contribution from every household. Interest from this fund pays for the extension of the system when new houses are built. GV gives technical support for these extensions when requested and keeps track of extensions, but does not need to give financial support for extensions. Capital renewals are decided upon in cooperation between the CSP and GV, and while GV does not cover the costs, it provides assistance in mobilising funds.

The partnering with RWSS is dominated by the bureaucratic approach, which means cooperation is governed by guidelines and rules. This should not be seen as something negative, as effective bureaucratic procedures are necessary for providing support to a large number of service providers. Communities can make limited changes to project design in the initial construction phase, but their role is rather limited. Schemes are designed by a RWSS engineer and implemented by a contractor. Under the Swajaldhara programme, communities were expected to contribute 10% of the capital costs, however this requirement has been abolished under the current program called NRDWP. The service delivery phase shows contributory and operational partnering, as the RWSS pays the electricity bills and provides manpower for regular maintenance. These roles are again defined by bureaucratic guidelines and rules.

4 Community Service Provider Level

The last section explained how the ESE operates and provides support to villages but in this section we examine experiences of support at the village level by investigating the community service providers that have been supported by the ESE. The section introduces the four villages and their service providers before moving to an assessment of their performance and partnering.

4.1 Context

As discussed above, four villages across Odisha were selected for this study. A map showing the village locations is given in Figure 6. The best practice villages are labelled 1 to 3, whilst number 4, *Tinkbir*, represents the control village.

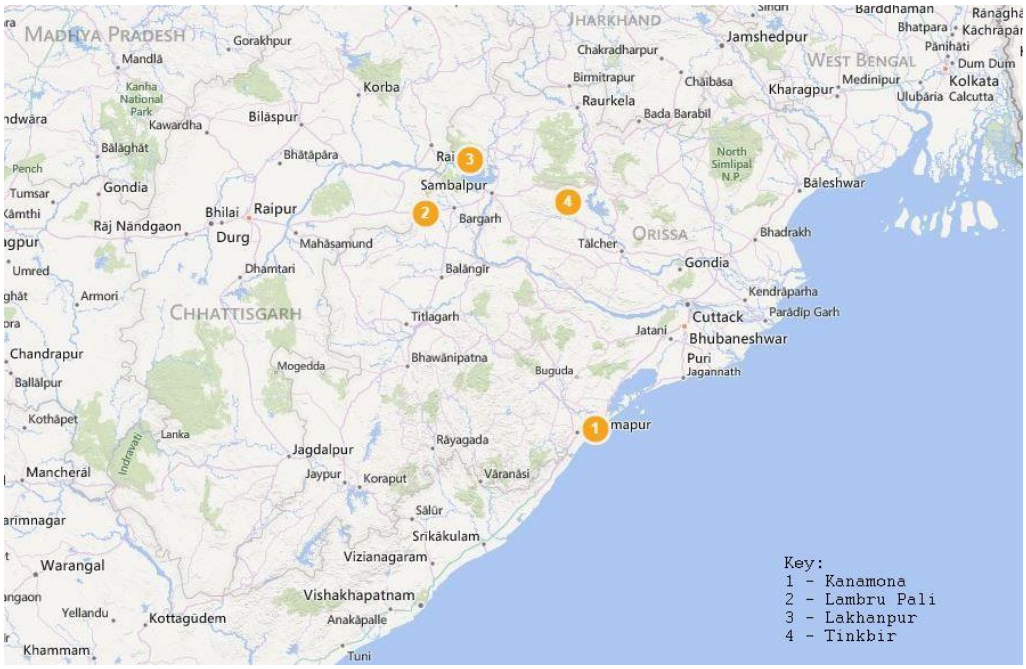

Figure 6: Location of the studied villages (source: bing.com/maps)

Table 6 gives an overview of the four villages. All villages are supplied by groundwater from boreholes. In all these villages water is pumped to overhead storage tanks and distributed from there. There are no public standposts in the best practice villages, since all the households have private connections. In *Tinkbir,* people get water from household connections, standposts as well as handpumps.

Table 6: Key facts of the studied villages

	Kanamona	Lambru Pali	Lakhanpur	*Tinkbir*
Block	Chhatrapur	Sohella	Lakhanpur	Riamal
Population	1114	660	1022	3705
Total households	253	175	237	911
Percentage SC	63%	43%	10%	14%
Percentage ST	1%	10%	47%	5%
Coverage with household connections	100%	100%	100%	29%
Tariff per month	Rs50/HH	Rs.30/HH	Rs.40/HH*	Rs.40/HH
Year of infrastructure implementation	2009-10	2010-11	2012-13	2009-10

**In Lakhanpur, tariff is set as INR 10 per person, with a cap of INR 100. Family members above 5 years are considered. Average of four per household used here for comparison.*

In Kanamona, an earlier attempt of setting up a water supply scheme in 1996 failed because of insufficient community participation and issues regarding accountability. Around 10 years later, in 2007, Gram Vikas was approached again and this time all castes and social classes were involved in the planning and formation of the VWSC and ultimately the scheme was completed in 2010. At the time of the second visit, planning and construction of a second well to augment the system had begun. The scheme brought wider benefits to the community as well. Many women use the time formerly spent on collecting water from the communal pond to breaking cashew nuts, earning around INR 3,000 a month in additional income.

The community in Lambru Pali approached GV in late 2007 and was shown completed schemes in nearby villages, which motivated them to take part in the programme. The water supply scheme implementation started in 2010 and was completed in 2011.

In Lakhanpur, after the village president had seen a completed scheme in a neighbouring village, work with Gram Vikas started with a public meeting in 2011. Initial difficulties in convincing the community were overcome by mobilising the female household heads who in turn convinced the male members of the community. The scheme was completed in 2013. Water is pumped to the overhead storage tank for 13 hours daily, however this quantity is not sufficient to provide continuous water supply to the users; instead water is supplied for three hours in the morning and two hours at night. Planning to augment the system with a second deeper borewell are under way, in order to provide continuous supply.

In *Tinkbir*, the control village, the borehole was drilled in 2003, whilst the overhead storage tank was constructed in 2014. Before that, users were supplied from the borehole directly. Different parts of the village are supplied consecutively and users receive water for 90 minutes a day. Parts of the main pipe are damaged and leak, which leads to users at the tail ends complaining about inadequate pressure and receiving limited quantities of water. There are 41 public stand posts and a part of the population rely on private wells.

Gram Vikas schemes and marriage

An interesting phenomenon could be observed in the interviews with Gram Vikas employees and villagers. Because of the high level of service achieved in the Gram Vikas schemes, with three taps and mostly continuous water supply, as well as the fact that villages are open defecation free, living in a Gram Vikas village has become a kind of status symbol. There are anecdotes of women from villages with Gram Vikas schemes not wanting to marry someone from a village where Gram Vikas has not worked, because they are used to the benefits and convenience of a well-functioning water supply scheme.

Overview of households sampled for household analysis:

The following two tables present an overview of the randomly sampled households in all four villages. As can be seen from the Table 7, the religion in all villages is almost exclusively Hindu. The three best practice villages have a large proportion of scheduled castes and tribes, whilst the control village is dominated by backwards castes. The difference between the percentages presented here

and the census data is due to our sampling size of 30 in each village, while the census takes into account all households. The level of education varies between best practice and control villages. Best practice villages, and within those especially Kanamona, have a higher proportion of self-reported illiteracy and people below matriculation. Mean household sizes are higher in the best practice villages than in the control village.

Table 7: Social indicators

Social Indicators		Lambru Pali	Kanamona	Lakhanpur	*Tinkbir*
Religion	**Hindu**	100%	100%	100%	97%
	Muslim	0%	0%	0%	3%
Caste	**BC**	60%	47%	48%	86%
	OC	0%	3%	3%	0%
	SC	30%	27%	24%	10%
	ST	10%	23%	24%	3%
Education (male household head)	**Illiterate**	13%	43%	13%	7%
	1st to 5th class	39%	23%	27%	14%
	6th to 10th class	32%	27%	50%	55%
	Intermediate	13%	3%	10%	10%
	Degree and higher	3%	3%	0%	14%
	Below matriculation	84%	94%	90%	76%
Household size	**Mean**	5.16	5.13	5.27	4.41
	Median	5	4	5	4

The economic condition of the surveyed households is presented in Table 8. The distribution of house types is quite uneven. Whilst all surveyed houses in Kanamona were of high quality (pucca), the other two best practice villages are dominated by low quality (kuccha) housing. Apart from Lakhanpur, all villages have nearly universal land ownership. Agricultural work dominates in all villages, although there are a significant proportion of people working in other sectors in all villages except Lambru Pali. Reported household incomes are slightly lower in Kanamona. In all villages around 90% of households earn less than 250,000 INR per year.

Table 8: Economic indicators

		Lambru Pali	Kanamona	Lakhanpur	*Tinkbir*
House type	Kuchcha (low quality)	65%	0%	67%	21%
	Semi-Pucca (medium quality)	7%	0%	33%	35%
	Pucca (high quality)	29%	100%	0%	45%
Land ownership		100%	90%	66%	100%
Occupation of male household head	Agricultural	52%	52%	53%	61%
	Agricultural wage labour	36%	3%	17%	4%
	Gov/regulated/irregular non-farm employment	7%	10%	3%	0%
	Self-employment including business	3%	28%	20%	21%
	Homemaker	3%	7%	7%	14%
Reported annual household Income (INR)	<= 25000	7%	13%	7%	7%
	25000 – 50000	19%	27%	13%	24%
	100001 – 150000	48%	40%	47%	38%
	150001 – 200000	10%	7%	13%	14%
	200001 – 250000	3%	7%	10%	7%
	250001+	13%	7%	10%	10%
	Mean income	92,793	80,616	105,300	96,620
	Median income	70,000	65,000	81,000	66,000

4.1.1 Infrastructure snapshot

Table 9 gives an overview of the water supply infrastructure found in the villages. Two of the best practice villages, Kanamona and Lakhanpur, have automatic chlorinators that use cooking salt for water treatment. They also have remote pump switching devices, so that pump operators can turn the pump on and off using their mobile phone.

Table 9: Infrastructure snapshot

	Kanamona	Lambru Pali	Lakhanpur	*Tinkbir*
Borehole depth	260 ft	400 ft	360 ft	270 ft
Number of pumps	2	1	2	1
Pump capacity	5 HP+3 HP	5 HP	5 HP + 3 HP	5.6 HP
Chlorinator	Yes	No	Yes	No
Remote pump switch	Yes	No	Yes	No
Public standposts	No	No	No	Yes (41)
Handpumps	No data	5	2	No data

4.2 Community service provider descriptors

As shown in Table 10, all four systems are managed by formal water committees, and each of the committees employ one pump operator. The complete coverage with household connections in the best practice villages leads to an equitable system by default, which is one of Gram Vikas' main goals. In *Tinkbir* on the other hand, the coverage with household connections is significantly lower amongst marginalised groups, pointing to issues with equity.

In the best practice schemes, various approaches to setting tariffs have been developed by the VWSCs in cooperation with GV. In Kanamona, every household pays flat rate of 50 INR a month, whilst a charge of 2 INR per square foot in the ground floor and 2.5 INR in floors above is levied if water is used for construction purposes. Users also pay a 600 INR for festivities such as weddings. In Lakhanpur, users pay a charge of 10 INR per head, with a cap of 100 INR per household. These tariffs reflect local conditions and preferences and show the highly participative nature of managing the systems.

Table 10: CSP Descriptors

	Kanamona	Lambru Pali	Lakhanpur	*Tinkbir*
Type of organisation	Formal water committee	Formal water committee	Formal water committee	Formal water committee
Organizational capacity				
Staffing of CSP governing body	12	11	23	14
Staffing of the CSP	13	12	24	15
Coverage with household connections				
Number of households with household connections	144	129	208	260
Households served by the CSP	144	129	208	911
Coverage with household connections	100%	100%	100%	29%
Coverage with household connections among vulnerable groups				
Number of SC/ST households with household connections	52	69	80	12
SC/ST households served by the CSP	52	69	80	170
Coverage with household connections among vulnerable groups	100%	100%	100%	7%
Financial descriptors				
Tariff per household and month (INR)	50	30	INR 10 per person	40
Connection costs (INR)	1000	1000	1000	500

4.3 Community service provider indicators

This section assesses the performance of the service providers using a set of indicators developed by the research team. Using a QIS, each parameter is assigned a score from 0 to 100, results of which are shown in Table 11, whilst explanations for the scores are given below.

In the best practice schemes, GV assists the community in forming a water committee before starting the water supply scheme. At least half of committee members have to be female and the committee should represent all castes and social classes in the village equitably. The members are selected unanimously and are trained by GV on various aspects of managing the schemes, such as book-keeping, tariff collection and technical issues. In best practice villages the water committees were found to be very active. In Lambru Pali the initial water committee has been reconstituted and expanded, and 2-3 members each from the committee are responsible for specific tasks such as bill collection. The committee in Kanamona had to be reconstituted after the initial failed attempt as the previous committee was not representative of all socio-economic strata of the village. In the government set-up, the water committee is usually a sub-committee of the Gram Panchayat. However, in *Tinkbir*, the old subcommittee under the Gram Panchayat failed, and the active members formed a new committee which is independent from the Gram Panchayat and, according to our interviews, works more effectively. Generally committees in the best practice villages were found to be more vibrant, aware of issues in the villages and accountable to users than the committee in *Tinkbir*.

In all villages, the collected tariffs are deposited in a separate bank account in the name of the water committee. The committees in all villages were found to be keeping track of the transactions and producing annual accounts, although more systematically so in the best practice villages. None of the accounts are audited externally.

It was observed that in Lambrupali the total collected tariffs just meet the electricity bill and the balance in the committee's bank account was very low. However, due to strong social cohesion, minor and major repairs are done effectively through informal cooperation. Whenever minor repairs of the main pipeline are required, young people from the villages working as plumbers in a nearby urban centre come and do the repairs free of charge. When a major repair of the main inlet pipe to the submersible pump was urgently required two years ago, the community quickly contributed to cover the expenses for it. Although this informal cooperation and ad-hoc collection of funds for repairs seems to be very effective at the moment, the sustainability of this model could be questioned. If the young people working as plumbers move away or stop doing repairs for free, additional funds for minor maintenance would be needed, which would have to be covered by an increased tariff.

In the best practice villages, the service providers were found to maintain a sketch of the scheme with a map of main pipeline and the distributaries as well as operational manuals related to the schemes. Gram Vikas makes an effort to 'de-mystify' these scheme designs and technical manuals to make them understandable to villagers. For example the hydraulics in the distribution network are not explained with engineering language such as total head and friction loss, but in very simple terms, e.g. by explaining that water flows from higher to lower places. In *Tinkbir* the staff had an understanding of the supply network layout but no maps or any kind of written technical documentation could be found. Similarly in best practice villages, service providers maintained systematic operational records of the duration of supply, the electricity bills, dates of cleaning of the storage tanks etc. Although some records are also kept in *Tinkbir*, they were found not to be as systematic.

None of the service providers currently use water meters. At the time of research, the VWSC in Kanamona had already purchased water meters and planned on installing them. However, the matter had not yet been decided in the village meeting and the VWSC felt that users would need to be convinced further before accepting water meters and volumetric tariffs. Measures aiming specifically at water security, such as ground water recharging were not observed. However, in the best practice villages, committee members were found to have some understanding of source sustainability and made efforts to curb water wastage. In Lambru Pali and Kanamona, the committee discouraged users from storing water in big containers. Even though there is continuous water supply, users would store water and empty the containers at the time water is being pumped to the overhead tank, in order to refill them with water they perceive as 'fresher', thereby wasting water. This issue was not observed in Lakhanpur because water is only supplied for 5 hours a day. However, there were still efforts to stop water wastage, mostly in order to reduce electricity bills. In *Tinkbir*, no awareness of these issues or measures to conserve water could be observed. No regular water quality testing is being done by VWSC members, because water from deep borewells is seen as safe anyway. Water quality is tested in the first two or three years by GV and annually by RWSS engineers.

Table 11: CSP performance indicators

Indicator	Kanamona	Lambrupali	Lakhanpur	*Tinkbir*
Selection of the board of the service provider	50	50	50	50
Information sharing and accountability mechanisms	100	100	100	50
Cash reserves	75	75	75	75
Book keeping	75	75	75	50
Technical folder	75	75	75	25
Registry of operational information	100	100	100	75
Water metering	0*	0	0	0
Water security measures	50	50	50	0
Water quality management	25	25	25	25

**In Kanamana, water meters have been purchased and installation is planned*

4.4 Community service provider participation assessment

This section provides an overview of the extent of community participation in service delivery. Participation is understood functionally as 'an active process whereby beneficiaries influence the direction and execution of development projects rather than merely receive a share of project benefits' (Paul, 1987). Using a participation ladder adapted from Arnstein (1968) and Adnan et al. (1992) and specifically designed for this project, the degree of community participation in community service provision is assessed at each stage of the service delivery cycle on a scale from consultation through functional to interactive. Results are given in Table 12 and explained in detail below. In general the community is involved to a much higher degree in best practice villages throughout the service delivery, which shows the effect support by Gram Vikas has in ensuring community mobilisation and participation.

Participation in the initial implementation phase was found to be on the functional level in best practice villages. Since GV follows quite a standardised approach, the communities are very involved during implementation but have limited scope in the modification of the overall scheme design, as there are several non-negotiable rules. Toilets need to be constructed before the water supply

scheme is started, and every household gets three taps, one for the kitchen, bathroom and toilet. All households are required to provide a labour contribution called '*shramdaan*' during the construction of the overhead storage tank. This reduces expenses and helps in developing a sense of ownership of the scheme. In *Tinkbir*, the assessment shows participation by consultation in the initial construction phase. The community requests a scheme from RWSS, which is then designed by RWSS engineers and constructed by a contractor. The community is informed and asked to agree with the design, but does not have scope for demanding an alternative.

In the service delivery phase, the best practice villages are assessed as having interaction participation. The VWSC in consultation with the community decides on aspects regarding the operation of the scheme, such as duration of supply, setting of tariffs, alteration of quantity of supply for special occasions etc. In *Tinkbir* functional participation was witnessed. Although the community can influence the operation to some extent through monthly meetings, such as alternating the time of water supply in the hamlets, they do not play a big role in decisions on the scheme management.

For asset renewal, the best practice villages were characterised by interaction participation, as the community in cooperation with the VWC and GV makes appropriate decisions. One example of this is the community deciding on and contributing quickly to the major repair in an inlet pipe for the submersible pump in Lambru Pali. In *Tinkbir* the community mostly depend on the RWSS for asset renewal and thus is marked by passive participation.

For service enhancement or expansion, in best practice villages interaction participation was observed. The VWSC closely involves the community in decision making regarding enhancement or expansion. In contrast to this in the control village, the community was found to be dependent on RWSS for any sorts of enhancement or expansion, which leads to passive participation.

Table 12: Participation assessment

Stage of delivery cycle	Kanamana	Lambrupali	Lakhanpur	*Tinkbir*
Capital Investment (implementation)	Functional participation	Functional participation	Functional participation	Participation by consultation
Service delivery	Interaction participation	Interaction participation	Interaction participation	Functional participation
Asset Renewal	Interaction participation	Interaction participation	Interaction participation	Passive participation
Service enhancement or expansion	Interaction participation	Interaction participation	Interaction participation	Passive participation

4.5 Community service provider costs

This section presents the various costs borne by the CSP from its own funds raised through the water tariff collected from the users. It covers data on recurrent costs, whilst the community contribution to initial construction is covered in the ESE costing section below.

Table 13 shows the recurrent cost borne by the CSP. All schemes only have one paid staff member, although their roles are slightly different across the villages. In Kanamona and Lakhanpur, the pump operator is also responsible for tariff collection, which is reflected in the higher salary, whilst in Lambru Pali users pay their bills at the VWSC directly and therefore no staff for tariff collection is needed. In *Tinkbir*, the pump operator is a skilled mechanic, which leads to a higher salary. In the

best practice villages, the overhead storage tanks are cleaned once a month using bleaching powder bought by the VWSC. In Kanamona and Lakhanpur, salt is bought for the chlorinator as well. The service providers supported by Gram Vikas meet the operating expenses out of their own funds, including electricity charges for pumping water to the overhead towers. The Gram Vikas schemes have similar total costs per person, whilst the cost per person is markedly lower in the control village. This is because in this village RWSS pays the electricity charges and the service provider only paid the costs of maintaining the pipelines and repairing the motor last year. No chlorination or water tank cleaning with bleaching powder takes place in *Tinkbir*, therefore no chemicals are bought. These factors lead to significantly lower costs per person, in terms of community contribution, for *Tinkbir*. However, if the electricity costs paid by RWSS are included, the total annual cost per person is INR 53, which is similar to the GV schemes.

Table 13: Recurrent costs covered by CSP

	Kanamona	Lambru Pali	Lakhanpur	*Tinkbir*
Salaries	25,200	12,000	36,000	60,000
Electricity	26,400	25,200	30,000	0
Chemicals	4,000	1,000	4,500	0
Spares and materials	3,000	1,500	1,000	24,000
Minor maintenance	1,000	1,000	500	5,000
Total recurrent annual cost to CSP (INR)	59,600	40,700	72,000	89,000

5 Household Service levels

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

5.1 Coverage

The sampled households in both control and best practice villages have very high percentages of household connections, as shown in Table 14. The GV schemes aim for 100% coverage with household connections, which is almost be achieved in the sample. The single households who did not have a household connection opted out of the scheme because they had private wells or a handpump just in front of their house, or no space for taps in their house. In *Tinkbir*, the coverage with household connections throughout the entire village is much lower, at 29%. However it was deemed more meaningful to compare GV-supported household connections with household connections in the control village, which is why more households with private connections were sampled in *Tinkbir*.

Table 14: Coverage

Type of source	Lambru Pali	Kanamona	Lakhanpur	*Tinkbir*
Household connection	96.8%	96.7%	90.0%	86.2%
Handpump, open well	3.2%	3.3%	10.0%	13.8%

5.2 Service levels

The analysis of household service levels shows that the schemes supported by Gram Vikas are delivering significantly better service than the scheme run by RWSS, as shown in Table 15 and Table 16. Users in best practice villages receive significantly higher service levels in terms of quantity, continuity and reliability. In one best practice village, Lakhanpur, a modification to the service level calculation was necessary to represent the reality of service received. In this village, water is available for three hours in the morning and two hours at night and customers use water for domestic activities during that time. Therefore consumers only need little storage, the volume of which is the basis for calculating quantity for intermittent supply. It can however be assumed that users receive more than the 40 litres specified in the Indian Norms, therefore these users were manually assigned 'basic' scores on the quantity parameter.

The higher scores on reliability show that the Gram Vikas-supported schemes are able to run its distribution with less breakdowns and react to faults more quickly than the control scheme. The RWSS scheme only supplies water for 30 minutes to two hours a day, leading to lower scores on continuity. Interestingly, all respondents considered their water quality 'good', in both best practice and control villages. Detailed tables showing service levels for each village are given in Annex 2.

Table 15: Service levels for best practice villages (n=91)

	Best Practice				
	Quantity	**Accessibility**	**Quality**	**Continuity**	**Reliability**
High	65%	97%	100%	99%	96%
Improved	0%	0%	0%	0%	3%
Basic	30%	0%	0%	1%	0%
Sub-standard	0%	1%	0%	0%	1%
No service	5%	2%	0%	0%	0%

Table 16: Service levels for control village (n=29)

	Control				
	Quantity	**Accessibility**	**Quality**	**Continuity**	**Reliability**
High	21%	90%	100%	0%	86%
Improved	10%	0%	0%	4%	3%
Basic	17%	7%	0%	88%	0%
Sub-standard	14%	3%	0%	8%	10%
No service	38%	0%	0%	0%	0%

5.3 Equity

In this section deals with the equity dimension is explored, specifically in regards to caste and socio-economic status. In regards to access to household connections, no discrimination could be found in the surveyed sample; the respondents using point sources belong to both BC and ST/SC. Lakhanpur and the control village were analysed in respect to quantity, as they showed large spreads in service levels for this parameter. As can be seen in Table 17, in Lakhanpur only one out of 14 SC and ST households receives acceptable service in respect to quantity, which could points to issues with equity in this regard. In the control village, no clear correlation between caste and quantity could be found.

Table 17: Caste and quantity Lakhanpur (n=29)

Quantity	Caste				
	BC	**OC**	**SC**	**ST**	**Total**
Improved	1	0	0	0	1
Basic	3	0	0	1	4
Sub-standard	6	1	4	3	14
No service	4	0	3	3	10
Total	**14**	**1**	**7**	**7**	**29**

Finally, the sample was analysed for correlations between socio-economic indicators and service levels. No correlation between total household income, land ownership and quantity or accessibility could be found. In *Tinkbir*, a correlation between household income and reliability could be found ($p=0.016$). In this village the households experiencing the highest number of breakdowns and the longest response time have some of the lowest incomes in the village.

5.4 User satisfaction

The survey also quantified the degree of satisfaction users express. As shown in Table 18, users are highly satisfied with the water supply received, in both best practice and control villages. Lakhanpur

shows the lowest overall satisfaction, which is caused by the intermittent water supply and the low quantities following from it. However, the percentage of dissatisfied users is still very low (7%), which suggests that people cope with the limited quantities and the other aspects of the service are working so well that the overall experience is still positive.

Table 18: Satisfaction with water supply

	Lambru Pali	Kanamona	Lakhanpur	*Tinkbir*
Very satisfied	97%	97%	80%	86%
Somewhat satisfied	0%	0%	13%	7%
Not satisfied	3%	3%	7%	7%

6 Enabling support environment costing

This section presents the costs associated with the ESE in supporting rural water supply to the CSP. It provides data, where available, on both Capital Expenditure (CapEx) on software and hardware. It also provides details on the CapEx contributed at the village level. Following this it presents the recurrent support costs incurred at the ESE level as well as estimates for direct and indirect support costs. These costs help in identifying the 'plus' component that supports the sustainable functioning of community-managed rural water supply systems in Odisha. All costs are given in INR unless otherwise specified. Costs incurred in the past are adjusted to 2014 prices using the annual average consumer price index calculated by the Reserve bank of India or the average construction price index for capex hardware derived from CIDC data. Software costs are based on 2014 prices and the number of man days and salaries gathered in key informant interviews at the ESE level.

6.1 Capital Costs

Table 19 shows capital expenditure. Investments in fixed assets and initial construction is listed under the CapEx Hardware category. As per Swajaldara guidelines, the community contributed 10% of construction costs, whilst the remaining 90% come from State and national governments and are channelled through the ESE. It should be recognised that because of the strong community involvement, there were further contributions in the best practice villages, such as voluntary labour contributions or providing food for the workers. However, these additional contributions were not quantified in the official records and monetary costs of them could not be obtained. The contribution to the restricted use corpus fund is included in the community contribution, although it is not spent immediately. This fund is necessary to keep the systems running at full performance and to ensure 100% coverage and is a one-time expense, which makes it a form of CapEx. This leads to a significantly higher community contribution in the best practice villages. Overall CapEx hardware per person is significantly lower in the control scheme, which may be explained by the fact that part of the population is not connected to the piped water system but supplied by public standposts and that as a larger village economies of scale are realisable.

CapEx software includes the cost of work with the communities prior to and during construction and implementation. This includes for example community mobilisation, attending meetings and training of the CSP, as well as costs for information materials like posters or training manuals. Because the best practice schemes were implemented several years ago, no accurate information about costs for mobilisation in each of the villages could be obtained. Therefore, information from key informant interviews was used to assess the average expenditure on CapEx software in Gram Vikas schemes, which was estimated at **INR 82,600** per scheme. As this is only an approximation, it was not deemed appropriate to divide it by the respective village sizes, as this would imply smaller villages receiving a higher level of support. Instead, it was divided by the average size of the best practice villages to arrive at the estimated CapEx software cost of **INR 81 per person.**

Gram Vikas gives communities significantly more software support, especially for community mobilisation, which leads to a much higher per person expenditure. The ratio of average hardware to software support in the GV schemes is around 30:1, compared to a ratio of 150:1 in the control village. This shows the emphasis GV places on ensuring community mobilisation and building the necessary capacity before starting a water supply scheme. Furthermore, the pre-construction

support by Gram Vikas is given over a long time, one year or more. This is necessary to ensure participation of every household but incurs a significant non-monetary cost, as the same number of staff days are stretched out over a longer period of time. Because GV implements a large number of schemes simultaneously, the organisation can provide support over such a long period of time in an economical way, as one employee can work on multiple schemes. A smaller NGO that only implements a few schemes could probably not afford stretching its support over such a long time.

Table 19: Capital Expenditure

	Kanamona	Lambru Pali	Lakhanpur	*Tinkbir*
CapEx hardware covered by ESE	2,413,683	1,350,511	2,827,321	4,433,902
Community contribution to CapEx	400,600	267,470	510,560	466,417
CapEx software	82,600*	82,600*	82,600*	34,736
Total CapEx Costs	**2,896,883**	**1,700,581**	**3,420,481**	**4,935,055**

** calculated as an average for the Gram Vikas schemes, therefore it was not divided by the respective village size*

6.2 Recurrent costs

Table 20 shows the recurring costs incurred by the ESE. Direct is the ongoing support that ensures CSP staff has the capacities and resources to manage the water supply system, as well as expenses for monitoring the performance of schemes. Estimating the direct support by Gram Vikas was a challenge, because most support is given by request and the studied villages did not require any support in the last year. At the time of research, there was a local supervisor staying in Kanamona. This supervisor is responsible for implementing new schemes in neighbouring villages, but also gave some support to the VWSC in Kanamona if requested. However, in the other villages, and indeed in most villages supported by GV, there is no such local supervisor. Therefore an estimation of average support costs was made from information gathered through key informant interviews and using the overall Gram Vikas accounts. It includes programme monitoring expenses, as well as 15% of the overall expenditure for rural water schemes as costs for 'stand-by' support, that is support given on request. This way, direct support costs on average across the GV schemes were estimated to be INR 33 per person per year. However, as the schemes being researched did not receive any such support during the period under investigation the research protocol required these amounts not to be included in the overall cost summary.

Gram Vikas does not give financial support for operation and maintenance, whereas RWSS pays the full electricity bill in the control village and gives support for maintenance such as repairing the motor pump. Whilst direct support costs are much lower in *Tinkbir*, the service provider requires this direct subsidy to run the scheme. This leads to a higher total per capita cost. This higher recurrent cost can be read in conjunction with the much lower capital expenditure on software in *Tinkbir*. Gram Vikas provides intensive support before implementation, which leads to VWSCs that are able to function independently and only require support on request. The committee in *Tinkbir* needs the direct subsidy as it does not have the capacity to cover the costs for electricity and other maintenance.

Indirect support costs are costs for high-level coordination and policy formulation. They were estimated as an average for Gram Vikas schemes at **INR 9 per person and year**. No data on indirect support costs for the control village could be obtained.

Table 20: Recurring costs at ESE level

	Kanamona	Lambru Pali	Lakhanpur	*Tinkbir*
Direct support costs	31,127*	31,127*	31,127*	44,436
Support for O&M	0	0	0	118,000
Support for O&M (INR)	0	0	0	32
Indirect support costs (INR)	9*	9*	9*	no data

** only estimated as average per capita costs for best practice schemes*

6.3 Capital maintenance

No information on capital maintenance expenditure (CapManEx) could be obtained in any of the villages, as no major repairs had taken place in recent years.

6.4 Overview of costs

Table 21 and **Error! Reference source not found.** give an overview of the costs, as well as funding sources for implementation and support. Figures are given as an average for the three best practice villages. The cost sharing is quite clear. The central government pays for initial implementation, with some community contribution. Operation and maintenance is paid by the community and Gram Vikas is responsible for providing ongoing support. We recognise that there are other indirect subsidies such as electricity tariffs that don't cover the generation costs, which could not be included due to the scope of this study. However, there is no direct subsidy from the electricity department. Service providers pay the public utility rate of INR 5.2 per unit, which is significantly higher than the rate of INR 1.2 per unit for irrigation and also higher than the rate for domestic electricity, which is charged according to an increasing block tariff from INR 2.2 to INR 5.2 per unit.

Table 21: Overview of total costs (INR)

	Community	Gram Vikas	GoI
Initial costs			
CapEx hardware	392,877	0	2,212,172
CapEx software	0	0	82,600
Recurring costs, per year			
Labour	24,400	0	0
Electricity	27,200	0	0
Maintenance and materials	5,833	0	0
Direct support	0	31,127	0
Indirect support	0	10,252	0

Table 22: Summary Cost Table (INR

Odisha 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 539	-	INR 539	INR 32	INR 29	-	-	-	INR 62
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	-	-	-	-	-	-	-	-	-
National Government	INR 2,337	-	INR 2,337	-	-	-	-	-	-
NGO national & international	-	INR 81	INR 81	-	-	-	INR 9	-	INR 9
International donor	-	-	-	-	-	-	-	-	-
TOTALS	INR 2,875	INR 81	INR 2,956	INR 32	INR 29	-	INR 9	-	INR 70
Median of 20 case studies			INR 3,231						INR 207
'Plus' %age	81%	100%	82%	0%	0%	-	100%	-	12%
Median of 20 case studies			95%						57%

Table 23: Summary Cost Table (PPP USD$)

Odisha 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	$ 30.72	-	$ 30.72	$ 1.85	$ 1.66	-	-	-	$ 3.51
Local self-government	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
State government entity	-	-	-	-	-	-	-	-	-
State water supply agency	-	-	-	-	-	-	-	-	-
National Government	$ 133.19	-	$ 133.19	-	-	-	-	-	-
NGO national & international	-	$ 4.62	$ 4.62	-	-	-	$ 0.49	-	$ 0.49
International donor	-	-	-	-	-	-	-	-	-
TOTALS	$ 163.90	$ 4.62	$ 168.52	$ 1.85	$ 1.66	-	$ 0.49	-	$ 4.00
Median of 20 case studies			$ 184.16						$ 11.78
'Plus' %age	81%	100%	82%	0%	0%	-	100%	-	12%
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 analysed the extent of support Gram Vikas gives to community service providers in Odisha and how this impacted their performance.

Gram Vikas is an NGO that has long history of working with communities in Odisha, especially in tribally-dominated and poor villages. It has a holistic goal of empowering poor and marginalised groups and improving their lives. Water and sanitation is seen as an entry point into communities and therefore is a major part of Gram Vikas' work. Gram Vikas has a very particular way of working with villages, in that it requires every single household in the village to actively participate in the intervention. However, the general applicability of this model could be questioned. Gram Vikas can choose to only work with villages that agree to these conditions, or motivate and mobilise communities until they do. A government department that has a mandate to cover a certain number of villages every year might not be able to demand this level of community participation.

Gram Vikas was found to be effectively organised and staffed and having a clear vision and mission, which is taken up by the employees. Intensive support is given to communities before implementation. A water committee is formed and members trained in technical, as well as administrative and financial matters. After this intensive training and support in the implementation phase, Gram Vikas provides a full range of support, although mostly on a request basis. Because water committees are functioning well, they often do not need support for longer periods of time. However, the fact that they can access support when needed, and that Gram Vikas quickly and effectively responds to requests, is a crucial part of the support environment. This approach of mostly on-demand support seems to be working very well, however, providing systematic retraining to committees after several years of operation could be a way to further ensure sustainability. Partnering between Gram Vikas and service providers was assessed as mostly operational and collaborative, which shows the close and good cooperation.

In best practice village, participation between the service providers and the community was found to be on the functional level in the initial investment phase and interactive in the rest of the service delivery cycle. This represents a significantly higher degree of community participation than the control village and shows the effect support by Gram Vikas has on ensuring community involvement in service delivery.

The type of service provision, according to the model developed by Smits et al. (2015), can be classified as community management *plus*, as shown in Figure 7. The community is highly involved and the water committee manages the system quite independently, although it gets some support from Gram Vikas. User charge collection is enough to cover recurring costs, so no direct financial subsidy is needed. The intensity of community involvement, as well as the professionalisation is lower in *Tibkbir*, the control village, which places it on the border to direct public provisioning with community involvement. This especially because user charges does not cover operating expenditure and RWSS, a government entity, pays the full electricity bills.

To validate the effectiveness of service provision, service levels were assessed using household surveys in all four villages. Best practice villages score significantly higher on all parameters, with the biggest differences in quantity and continuity. In villages supported by Gram Vikas, 95% of users

receive acceptable quantities, compared to 48% in the control village. Due to the complete coverage with household connections, the schemes in best practice villages are equitable in access to connections by default, whilst coverage amongst marginalised groups is significantly lower in *Tinkbir*.

Direct support costs for Gram Vikas schemes in general were estimated at INR 33 (not benefited from during research period in this case), indirect support costs at INR 9 per person and year. These support costs are significantly higher than the INR 12 per person per year spent on direct support by RWSS, the support organisation for the control village. However, the control village needs subsidy for ongoing operation and maintenance, mostly electricity, at INR 32 per person and year. Initial costs for capacity building and community mobilisation were estimated at INR 81 per person for Gram Vikas, which is about ten times more than the INR 9 spent in the control village. The ratio of capital expenditure on software to hardware is around 1:30 in the Gram Vikas schemes, compared to 1:150 in the government setup. This shows the great emphasis Gram Vikas puts on mobilising communities and ensuring participation before the project starts. This leads to more independent and effective service providers and might be the reason why no financial subsidy for ongoing operation is needed.

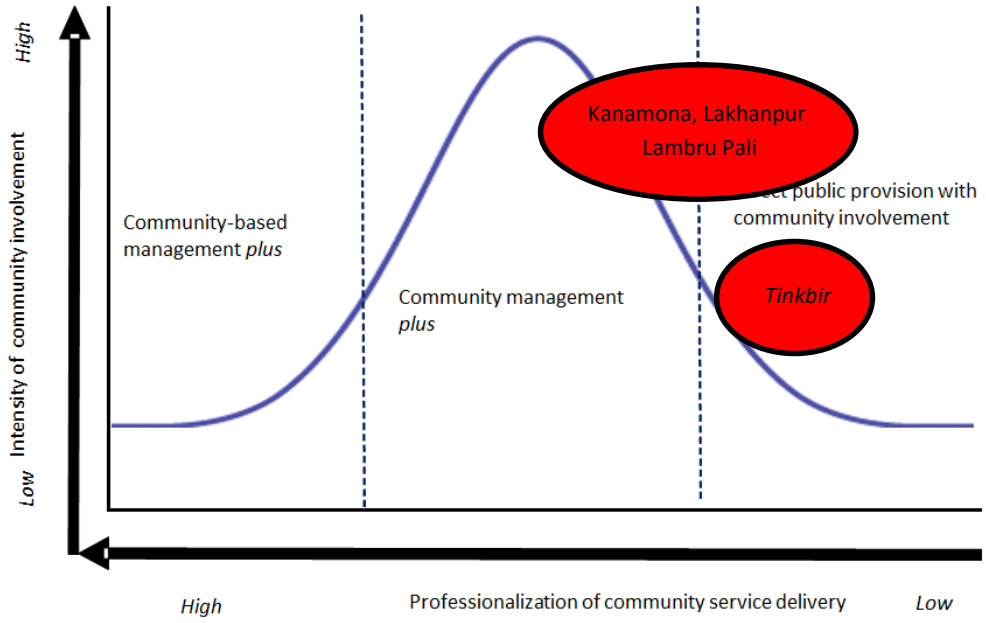

Figure 7: Typology of management for the four service providers

Overall, these findings suggest that the current model followed by Gram Vikas in implementing and supporting community-managed rural water supplies leads to very effective service provision and equitable schemes. Even though Odisha is one of the least developed states in India, the level of service achieved is very high, with the goal of full coverage and 24-hour supply reached in two of the studied villages. This excellent service leads to a high willingness to pay, as well as a sense of ownership and pride. However, the model of a high threshold for participation, with several non-negotiable conditions before implementation, might not be replicable for a government agency that has a mandate of extending coverage quickly and cannot choose not to implement a scheme in a village where the conditions are not met.

References

Arnstein, S.R. 1969. A Ladder of Citizen Participation. *Journal of the American Planning Association* 35 (4): 216–224

Boulenouar, J., Schweitzer, R. and H. Lockwood. 2013. *Mapping sustainability assessment tools to support sustainable water and sanitation service delivery*. Wivenhoe, UK: Aguaconsult

Davis J. and Iyer P., 2002.Taking Sustainable Rural Water Supply Services to Scale.A Discussion Paper. Washington, D.C.: Bank Netherlands Water Partnership – Water and Sanitation Program.

Demirjian, A. 2002.*Partnering in Support of International Development Initiatives: The INTOSAI Case Study*. Consulting and Audit Canada

Fonseca, C., Franceys, R. & Perry, C. 2010.*Guidelines for User Fees and Cost Recoveryfor Rural, Non-Networked, Water and Sanitation Delivery*, African Development Bank, Tunis

Fonseca, C., Franceys, R., Batchelor, C., McIntyre, P., Klutse, A., Komives, K., Moriarty, P., Naafs, A., Nyarko, K., Pezon, C., Potter, A., Reddy, R. and Snehalatha, M., 2011. *Life Cycle Costs Approach; Costing sustainable services. Briefing Note 1a (second edition)*. The Hague, the Netherlands: IRC International Water and Sanitation Centre

Fonseca, C.; Smits, S.; Nyarko, K.; Naafs, A. and Franceys, R. 2013.*Financing capital maintenance of rural water supply systems: Current practices and future options*.WASHCost Working Paper No. 9. The Hague, the Netherlands: IRC International Water and Sanitation Centre.

Franceys, R. 2001. *Promoting international scientific and technological co-operation in sustainable water and sanitation for people*. In: OECD. 2001. International Science and Tecnology Co-Operation: Towards Sustainable Development. Proceedings of the OECD Seoul Conference.

Franceys, R. and Gerlach, E. 2008.*Regulating water and sanitation for the poor: Economic regulation for public and private partnerships*.London, United KingdomK: Earthscan.

Government of India (2011) *India Human Development Report 2011: Towards Social Inclusio*n. Oxford University Press, New Delhi. Available from: http://www.iamrindia.gov.in/ihdr_book.pdf (Accessed: 8 July 2015).

James, A.J., 2011. India: *Lessons for Rural Water Supply; Assessing progress towards sustainable service delivery*. The Hague: IRC International Water and Sanitation Centre and Delhi: iMaCS.

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

Moriarty, P. Smits, S., Butterworth J. and R. Franceys. 2013. Trends in rural water supply: towards a service delivery approach. *Water Alternatives* 6(3): 329-349

Moriarty, P., Batchelor, C., Fonseca, C., Klutse, A., Naafs, A., Nyarko, A., Pezon, K., Potter, A., Reddy, R. and Snehalata, M., 2011.*Ladders and levels for assessing and costing water service delivery*. WASHCost working paper No. 2. The Hague, The Netherlands: IRC International Water and Sanitation Centre.

Nickson, A. and R. Franceys. 2003. *Tapping the Market; The Challenge of Institutional Reform in the Urban Water Sector*. Palgrave MacMillan: UK

Smits, S. and K. Baby. 2013. *Islands of success; Towards water, sanitation and hygiene services for*

Smits, S., Franceys, R., Mekala, S. & Hutchings, P. (2015) *Understanding the Resource Implications of the 'Plus' in Community Management of Rural Water Supply Systems in India: Concepts and Research Methodology (Working Paper).* Cranfield University/IRC.

Smits, S., Verhoeven, J., Moriarty, P., Fonseca, C. and H. Lockwood. 2011. Arrangements and costs of support to rural water service providers. WASHCost Working Paper 5. The Hague, The Netherlands: IRC International Water and Sanitation Centre

Smits, S.; Rojas, J. and Tamayo, P. 2013. The impact of support to community-based rural water service providers: Evidence from Colombia.*Water Alternatives* 6(3): 384-404

WASHPlus. 2013. *WASH Sustainability Index Tool*. Online tool, at: http://www.washplus.org/rotary-usaid

Appendices

Appendix 1: Scoring tables for Gram Vikas

Institutional Assessment

Statement	Agreement
Organisational autonomy	
Sets own organisational policies and goals and changes them as necessary to provide guidance and direction in achieving the objectives of the institution	Strongly Agree (4)
Determines level of funding required to meet organisational goals and secures sufficient funds from appropriate sources	Strongly Agree (4)
Conducts such studies as may be necessary and carries out long-term planning to meet the expected demands on the institution; approves and acts on such studies and plans, including appropriate levels of investment to meet future demand	Agree (3)
Determines own organisational structure including roles and responsibilities of major divisions	Strongly Agree (4)
Employs levels of employee compensation, including salaries and benefits, sufficient to attract and retain capable staff	Agree (3)
Average Score	3.6
Leadership	
Provides clear sense of mission; articulates mission; involves people with the mission so they get a sense of ownership of mission; gets people excited about the mission, believing in it.	Strongly Agree (4)
Identifies clear performance standards and is strict but fair; gives positive and negative feedback where due; disciplines where necessary based on performance.	Strongly Agree (4)
Maintains sense of balance between future vision and everyday operational matters.	Agree (3)
Demonstrates personal integrity (i.e., does not claim false overtime, take money, or cut corners for personal gain); instils sense of integrity in others.	Strongly Agree (4)
Continuously guides technical staff on need to ensure that levels of technology used by the institution are those which are most suitable in terms of simplicity of operation and maintenance; monitors activities in this regard.	Strongly Agree (4)
Average Score	3.8
Management and Administration	
Managers have a clear sense of their own and others' roles and responsibilities. They communicate roles and expectations clearly to others and involve them in the process of defining their roles and responsibilities.	Strongly Agree (4)
People are held accountable for getting work done.	Strongly Agree (4)
Administrative systems for the following functions have been developed and are regularly used. (Note: rate each system for effectiveness.)	
a. Accounting and Budgeting	Strongly Agree (4)
b. Personnel	Strongly Agree (4)
c. Management Information	Agree (3)
Average score	3.8
Community Orientation	
Staff at every level demonstrate that they are oriented toward serving the	Strongly Agree (4)

community / community service provider, and ensure engagement with different groups within community, including the most marginalized; when observed, their decisions and actions are clearly driven by what is best for the community.	
There are identifiable mechanisms for communities / community service providers to interact with key areas of the institution over important matters (e.g., call-down for technical assistance, bill disputes, service problems), that are also accessible to the most marginalized groups within the community.	Agree (3)
There is clear evidence that the institution responds to complaints, emergencies, and suggestions which community members / community service providers make.	Strongly Agree (4)
There are identifiable, ongoing, and effective measures to educate communities / community service providers about institutional services and requirements.	Agree (3)
The institution makes efforts to invite and evoke an effective level of community / community service providers participation (e.g., mechanisms for communities to bring concerns/complaints to the institutions).	Strongly Agree (4)
Average score	3.6
Technical Capability	
Consistently makes sound technical decisions and effectively serves management by conducting technical studies and planning as requested.	Agree (3)
Ensures effective control of the quality of the end product and all other technical operations.	Strongly Agree (4)
Uses or adapts technology which is suitable for the specific needs of the institution and avoids temptation to use more exciting-but not appropriate-technologies learned by staff who were trained in other settings.	Strongly Agree (4)
Maintains levels of in-house technical skills adequate for routine technical responsibilities and sub-contracts to outside specialists those tasks which are either beyond the institution's own capabilities or necessary to meet peak needs.	Agree (3)
Conducts practical research and experiments to improve existing uses of technology for local conditions and needs.	Agree (3)
Average score	3.4
Developing and Maintaining Staff	
A clear process for determining skill needs exists and is the basis for designing training programmes.	Strongly Agree (4)
A system exists for developing competent managers and supervisors.	Strongly Agree (4)
The institution provides adequate incentives to maintain staff (i.e. salary levels, employee, benefits)	Agree (3)
A clear system exists for hiring qualified personnel and firing or disciplining personnel when necessary.	Agree (3)
A career path is open to social/community development staff and technical staff and management staff.	Agree (3)
Average score	3.4
Organizational Culture	
An observable team spirit exists among the staff.	Strongly Agree (4)
People express a sense of ownership and pride about working that is communicated by such statements as "this is a good place to work."	Strongly Agree (4)

Employees are able to articulate the history and legends of the organization in positive ways.	Strongly Agree (4)
Continuity in the organizational culture is maintained (even with staff turnover at high or low organizational levels).	Strongly Agree (4)
Staff place a value on maintaining the organisations physical infrastructure (offices, treatment plants, grounds) of the organization. Facilities look clean, well maintained, and attractive.	Strongly Agree (4)
Average score	4
Interactions with Key External Institutions	
Top management stays well informed about external policy, financial, and regulatory issues and actions.	Strongly Agree (4)
Management maintains direct contact with the key individuals in all important external entities.	Strongly Agree (4)
Specific strategies are formulated to influence policies, legislation, and other activities to obtain necessary approvals and resources.	Strongly Agree (4)
Programmes are developed to influence the public in support of institutional goals.	Agree (3)
To the extent to which it is not already responsible/involved in services, local government/Panchayati Raj is kept full informed and involved in the process of support and monitoring	N/A
Average score	3.75

Partnering assessment

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

	maintenance	
C. Operational	ESE and CSP work together contributing labour and/or resources to support administration, management, operation and maintenance	Agree (3)
D. Consultative	The ESE and CSP have a systematic and transparent system for sharing information regarding administration, management, and operation and maintenance	Strongly Disagree (1)
E. Transactional	The ESE and CSP fulfill different elements of the administration, management, and operation and maintenance functions as per negoitated arrangements	Disagree (2)
F. Bureaucratic	Bureaucratic standards dictate the system for administration, management, and operation and maintenance	Strongly Agree (4)
Asset Renewal	**Statement**	**Agreement**
A. Collaborative	ESE and CSP share responsibility for decision making regarding asset renewal	Agree (3)
B. Contributory	ESE and CSP save and pool financial resources to meet the costs of asset renewal	Strongly Disagree (1)
C. Operational	ESE and service provider contribute labour and/or resources for asset renewal	Disagree (2)
D. Consultative	ESE and CSP systematically share information regarding service levels and technology status enabling proper planning for asset renewal	Disagree (2)
E. Transactional	Asset renewal is dependent on ngeoitations between ESE and CSP following a request from the CSP	Agree (3)
F. Bureaucratic	Asset renewal is dependent on generic programme timelines (i.e. every X years)	Agree (3)
Service Enhancement or Expansion	**Statement**	**Agreement**
A. Collaborative	ESE and CSP share responsibility for decisions regarding service enhancement or expansion	Strongly Disagree (1)
B. Contributory	ESE and CSP save and pool financial resources to meet the costs of service enhancement or expansion	Strongly Disagree (1)
C. Operational	ESE and CSP contribute labour and/or resources for service enhancement or expansion	Disagree (2)
D. Consultative	Information regarding service levels, technology status and population is systematically shared, enabling proper planning for service enhancement or expansion	Agree (3)
E. Transactional	Service enhancement or expansion is dependent on negotiations between ESE and CSP following a request from the CSP	Agree (3)
F. Bureaucratic	Planned asset replacement, expansion or renewal is dependent on generic programme timelines (e.g. every X years and/or with every X% of population increase)	Strongly Disagree (1)

Appendix 2: Service level tables

	Lambru Pali (n=31)					Kanamona (n=30)				
	Quantity	Accessibility	Quality	Continuity	Reliability	Quantity	Accessibility	Quality	Continuity	Reliability
high	97%	97%	100%	100%	90%	97%	100%	100%	100%	100%
improved	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%
basic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
sub-standard	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%
no service	3%	0%	0%	0%	0%	3%	0%	0%	0%	0%

	Lakhanpur (n=30)					Control village: Tinkbir (n=29)				
	Quantity	Accessibility	Quality	Continuity	Reliability	Quantity	Accessibility	Quality	Continuity	Reliability
high	0%	93%	100%	96%	97%	21%	90%	100%	0%	86%
improved	0%	0%	0%	0%	3%	10%	0%	0%	4%	3%
basic	90%	0%	0%	4%	0%	17%	7%	0%	88%	0%
sub-standard	0%	0%	0%	0%	0%	14%	3%	0%	8%	10%
no service	10%	7%	0%	0%	0%	38%	0%	0%	0%	0%