

Acknowledgements

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References used in the preparation of the report are included in the Bibliography.

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Foreword

Sustainability of small piped water supply systems in rural areas is critical in securing improved service delivery in the long term. As a result, the thrust of Government of India's National Rural Drinking Water Programme (NRDWP) is on source and system sustainability. System sustainability rests upon adequate Operations and Maintenance (O&M), comprising both technical and financial aspects.

In this respect, NRDWP's approach of devolving O&M functions to GPs, through the formation of Gram Panchayat/Village Water and Sanitation Committee (GP/VWSCs) has had mixed results: while successful in some instances, in some cases the limited expertise within Gram Panchayats has led to system deterioration. It is thus felt that while responsibility and funds for service delivery may continue to vest with the Gram Panchayat, the actual functions associated with the maintenance and delivery of services may benefit from technical and professional inputs. Such options for undertaking O&M of water supply schemes, through outsourcing to non-State providers are being considered in some states by Panchayati Raj Institutions and Public Health Engineering Departments.

This document, prepared in association with the Water and Sanitation Program (WSP), World Bank, seeks to capture cases illustrating some of these arrangements with non-State agencies. While such initiatives are as yet few, they point to the potential for improved system sustainability and service delivery that may be achieved, and may serve as role models for further replication.

Three options are described, including entering into an agreement with a community-based organisation, trust or society; and contracting with local operators. Given the wide variation in the context of villages in the country, a single arrangement may not be practicable, and a menu of models for O&M—including through GP/VWSCs, where effective—will facilitate the adoption of appropriate arrangements to suit specific requirements.

I wish to place on record our appreciation of the WSP for undertaking this study and bringing out this report.

New Delhi
15th February 2013

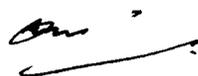

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Abbreviations

ARWSP	Accelerated Rural Water Supply Programme
BP	Block Panchayat
CBO	Community Based Organisation
DDWS	Department of Drinking Water Supply
DWSS	Department of Water Supply and Sanitation
FYP	Five Year Plan
GoI	Government of India
GP	Gram Panchayat (local government entity at village level)
GPWSSC	Gram Panchayat Water Supply and Sanitation Committee
km	kilometre
lpcd	litres per capita per day
m	metre
MDWS	Ministry of Drinking Water and Sanitation
MoU	Memorandum of Understanding
NRDWP	National Rural Drinking Water Programme
NSSO	National Sample Survey Office
O&M	operations and maintenance
OHSR	Overhead Storage Reservoir
PHED	Public Health Engineering Department
PRI	Panchayati Raj Institution
PWSS	Piped Water Supply Scheme
RGNDWM	Rajiv Gandhi National Drinking Water Mission
RWS	Rural Water Supply
RWSS	Rural Water Supply Scheme
SHG	self-help group
sq km	square kilometre
VWSC	Village Water and Sanitation Committee
ZP	Zila Panchayat

1 USD = INR 54 (February 2013)

Executive Summary

Taking an integrated approach to the country's rural water supply issues, Government of India's (GoI's) National Rural Drinking Water Programme (NRDWP) focusses on the key aspects of source and system sustainability. System sustainability is inextricably linked to both technical and financial aspects of operations of Rural Water Supply Schemes (RWSSs).

A key plank of NRDWP's approach—as well as that of the Sector Reform Project that preceded it—is the devolution of operations and maintenance (O&M) functions, particularly related to distribution at the village level, to Gram Panchayats (GPs), or local government entities, through the formation of Village Water and Sanitation Committees (VWSCs). However, the lack of substantive community engagement in planning and implementation of schemes as well as capacity constraints in GPs has limited the spread and implementation of this approach. As reported in a recent study for the Planning Commission (PC, 2010), only a fourth of GPs surveyed reported VWSCs and less than 1 percent of the respondents were aware of the VWSCs' existence.

The management of small piped water supply schemes (typically aimed at single villages) by communities or associations has many advantages but some limitations as well. While the issues of local capability may be addressed by training programmes, it is observed that the quality of community management frequently declines

over time (WSP Field Note, 2010). There is loss of interest, and committees often have trouble persuading households to continue to meet water charges. Moreover, limited resources are available at higher levels to continue supporting village-level entities. Piped water supply schemes, in particular, may be complex and, as they age, frequently require repairs beyond the technical capabilities of rural community groups.

With the NRDWP prioritising household-level water security and movement up the water ladder (that is, working towards adequate and safe water supply through house connections), massive investment, aimed at responding to both system and source sustainability issues, is proposed for rural drinking water supply in the coming years. The sector's human and financial needs, including those for O&M, are likely to increase significantly. This increase emerges amidst widely observed concerns in relation to O&M of even the existing infrastructure, as noted above. Unless these are addressed, it is likely that the significant investments proposed in the sector in the coming years would remain at risk.

It is in this context that a case emerges for exploring alternate options for O&M that ensure appropriate and timely preventive and corrective O&M through dedicated, qualified staff at reasonable cost. Such alternate options, particularly through non-state providers, are already being considered in some states by


Table: Indicative Appropriateness of Option to Context

Option/Model	Relevance to Context/Applicability
SHG	Small, isolated settlements (approximately 1,500–3,000 population); simple schemes
Registered trust, society, etc., dedicated to rural water supply services	Small and large villages (5,000–15,000 population), with good technical capacity within the community
O&M contract	Large villages or a cluster of small villages providing sufficient scale of operations (over 20,000 population)

local government institutions and Public Health Engineering Departments (PHEDs). This study documents three such options, focussing on small piped water supply schemes and the distribution end of the water supply value chain. Initiatives in this segment are still limited to only a handful of cases, and those documented here constitute initial attempts in this direction. In order of increasing involvement of the non-state provider, these options are:

- Empowering community-based entities such as self-help groups (SHGs) through Memoranda of Understanding (MoUs) for the provision of services;
- Instituting registered societies or trusts (formed among the resident population) dedicated to providing water supply services, and operating on a profit or not-for profit basis; and
- Engaging a service provider through a simple O&M contract.

The adoption of any one option is influenced by the particular context of the settlement and the water supply scheme, including the size of settlement; geographic context; economic profile; available capacity and the community's inclination to undertake services; age, condition and complexity of the RWSS; household willingness to meet water charges, etc. However, given the wide variation in the contexts of GPs in the country, it is proposed that a menu of options may increase the possibility of a good fit between context and arrangement for O&M. Clearly, one size cannot fit all. The table captures the indicative appropriateness of each option to various contexts (although this is by no means definitive).

Each of the above options is documented through a case study in the report, and learnings on engaging non-state providers for service delivery are captured in the concluding section. Key among these are:

- Operational sustainability is facilitated in a context in which there is a clear guidance/ policy for meeting costs through a combination of user charges and state grants. Information on consumption and costs are critical in establishing such a context;
- There is a need for capacity building of all stakeholders, including GPs, communities and providers, in order to build understanding and support for initiatives;
- Even for the management of small systems, contractual relationships must be formalised through clear agreements that define the roles and responsibilities of all stakeholders;
- Aligning incentives to objectives facilitates performance. Even in the simplest contracts, the achievement of clearly identified and stated objectives (such as increase in the number of house connections) is facilitated by providing clearly-stated incentives through the contract;
- Sustainability of any arrangement is inextricably linked to community involvement in the long term, through mechanisms such as downward accountability or periodic information sharing; and
- A supportive leadership and political will are required to address the resistance of vested interests that may attempt to stall initiatives.

Background

In India, the primary responsibility for rural drinking water supply rests with the state governments. At the national level, the Ministry of Drinking Water and Sanitation (MDWS),¹ Government of India (GoI), is the nodal ministry responsible for overall policy, planning, funding and coordination of rural drinking water and sanitation programmes and provides policy, technical and financial support to the efforts of the state governments.

The focus of the central government's support to the states and institutional arrangements at the GoI level to facilitate this have evolved over time in response to emerging sector issues. Thus, while GoI's first major intervention in the sector, the Accelerated Rural Water Supply Programme (ARWSP), launched in 1972-73, focussed on supporting states in their efforts towards accelerating coverage, GoI has engaged on a wider range of issues over time. Issues around water quality, appropriate technology and human resource development received attention with the launch of the National Drinking Water Mission in 1986 (renamed the Rajiv Gandhi National Drinking Water Mission [RGNDWM] in 1991). In 1999, amidst growing recognition of the merits of a community-oriented, demand-driven approach in responding to emergent sustainability issues,

the (then) newly created Department of Drinking Water Supply (DDWS) piloted the Sector Reform Project which involved communities in the planning, implementation and management of Rural Water Supply Schemes (RWSSs) and was scaled up as Swajaldhara in December 2002. More recently (2009), the ARWSP has been recast as the National Rural Drinking Water Programme (NRDWP) to respond to the challenges related to source and system sustainability, coverage, quality, financing of operations and maintenance (O&M) and equity, identified as critical issues in the 11th Five Year Plan (FYP) (2007-12). (For a more detailed account of the evolution of sector policies, refer to Annex 1.)

Household-level water security is a central theme of the NRDWP and the programme recognises that such security is predicated on sustainability of water availability in terms of potability, adequacy, convenience, affordability and equity and the adoption of a decentralised implementation approach with substantive roles for Panchayati Raj Institutions (PRIs, or local government institutions) and communities. In this context, the NRDWP emphasises the need for rigorous bottom-up water security planning with inputs and guidance from relevant departments and agencies;² conjunctive use of ground and surface water sources, water

¹ Separate Ministry status was conferred on the Department of Drinking Water and Sanitation (DDWS), Ministry of Rural Development (MoRD), GoI, in 2011.

² The Drinking Water Security Plans are expected to draw appropriate input from departments such as Agriculture, Education, Environment & Forest, Health, Panchayati Raj, Water Resources and Women & Child Development. The Drinking Water Security National Pilot Programme to test the operationalisation of the water security planning approach before nation-wide scale-up is being provided strategic guidance at the national level through a Working Group with representation from the Central Ground Water Board, Indian Space Research Organisation, Central Arid Zone Research Institute, National Institute of Health & Family Welfare, Andhra Pradesh Farmer-managed Groundwater Systems Project, Tarun Bharat Sangh, Ministries of Agriculture, Environment, Power and Water Resources, Planning Commission, the World Bank, UNICEF and WaterAid.



conservation, rainwater harvesting, revival of traditional systems and recharge of water sources, to optimise use of all available resources; and provides states the flexibility to incorporate the principles of decentralised, demand-driven, area-specific strategies that take into account all aspects of sustainability (source, system, finance and management) of the rural drinking water supply infrastructure.

Even while aspects of resource management and sustainability have legitimately been emphasised in the NRDWP, the programme simultaneously recognises that the actual experience of water security at the household level will critically depend not only on water resource availability and sustainability but also on robust arrangements for O&M that make for sound technical and financial operations. The NRDWP therefore suggests the need for ensuring a complete buy-in and involvement of local entities in the planning, implementation and O&M of RWSSs. Towards this end, it has introduced an incentive for states that transfer water supply assets to PRIs and also provides a 10th of its allocations for O&M. Presently, O&M responsibilities for RWSSs typically rest between line departments, PRIs and Village Water and Sanitation Committees (VWSCs). The experience with this, given widely acknowledged concerns over scheme sustainability, has been, at best, mixed. In this context, there has emerged a case for examining alternative options for O&M of rural drinking water supply schemes (especially in the backdrop of recent attempts by concerned departments and PRIs in some states to involve

non-state entities in the O&M of rural drinking water supply schemes), and the opportunity such involvement may offer in terms of achieving improved operational and financial efficiencies.

This report presents the documentation and assessment of currently adopted options for the involvement by non-state agencies in the O&M of rural drinking water supply schemes in India. This is informed by a series of case studies in select locations in Maharashtra, Karnataka and Punjab with a view to assess and analyse the current situation, identify emerging issues and lessons, and inform further GoI decision-making in this regard.

A. Sector Overview

i. Institutional Arrangements

In India, the primary responsibility for rural drinking water supply rests with state governments. GoI provides policy, technical and financial support to their efforts. In line with the central role envisaged for the state governments, it is the state Public Health Engineering Departments (PHEDs or equivalent departments and agencies) that have traditionally planned, implemented, monitored and managed rural drinking water supply schemes. Following the 74th Constitution Amendment Act 1992, the state governments are envisaged to devolve greater sector responsibilities to PRIs at various levels, that is, the Zila Panchayats (ZPs) at the district level, the Block Panchayats (BPs) at the block level and the Gram Panchayats (GPs)—local government entities—at the village level. Currently:³

³ Given the large number of states in India and differences in their approach to, and pace of, devolution of powers to PRIs, the description here is broad.

- The MDWS provides policy, technical and financial support to state governments; facilitates sector coordination and human resource development; and monitors and evaluates the working of rural drinking water (and sanitation) programmes; and
- The state governments, through PHEDs, are responsible for policy development, providing technical and financial support, undertaking sector coordination functions and monitoring and evaluating public programmes. The PHED is supported by the State Water and Sanitation Mission, a registered society under the aegis of the PHED with representation from nodal officials of various concerned state government departments, and the Water and Sanitation Support Organisation, a multi-disciplinary unit under the State Water and Sanitation Mission, for strategising, facilitating and monitoring 'soft' aspects of the Rural Water Supply (RWS) sector across the state.

The critical functions of water resource planning, development and management are also undertaken at the state level through Water Resource Departments (WRDs, or equivalent departments and agencies). Economic regulation—setting, monitoring and enforcing of service standards and tariffs—in the water resource sector is also undertaken by the WRDs, though some states have been considering independent regulators in the recent past.

- Responsibilities for planning, implementation, monitoring and O&M of rural drinking water supply schemes, including tariff-setting for

consumers and collection of revenues, are envisaged to rest with PRIs, particularly the ZPs (generally for multi-village schemes) and GPs (for hand pumps, tube wells and single-village schemes), with PHED personnel at the district and village level providing technical (design and supervision) support to the PRIs. However, the varying pace and practice of devolution across states implies that, in practice, responsibilities for planning, implementation, monitoring and O&M of schemes rest between the PHEDs and the PRIs. There is emerging recognition, though, of the need for these responsibilities to be assumed by PRIs in time and PHEDs to be re-oriented as technical support providers to PRIs.

ii. Household-level Arrangements

An analysis of household-level water supply arrangements for rural households (Table 1) suggests progress on the water ladder, that is, movement towards improved arrangements. This is reflected in the declining dependence on unprotected sources over time even though household coverage with stand posts and house connections, the 'higher rungs' of the water ladder, remains slow and low—increasing only from about 20 percent to about 30 percent over 1993 to 2009.⁴

The movement on the water ladder has been propelled by significant central and state plan investment. From the first (1951-56) to the 10th FYP (2002-07), the RWS sector witnessed central and state plan investments of about Rs. 674 billion and the 11th FYP (2007-12) envisages central and state plan investment of about Rs. 880 billion (nearly three times that during the 10th FYP) (Planning Commission, 2010).

⁴National Sample Survey Office (NSSO), Ministry of Statistics & Programme Implementation, GoI, 2010; World Health Organization-UNICEF Joint Monitoring Programme, 2010.


Table 1: Rural India: the Water Ladder

Year, Source	Percentage of Rural Households Dependent on Various Arrangements (%)				
	Unprotected	Wells	Hand Pumps/ Tube Wells	Stand Posts	Household Connections
1993, NSS	33	4	45	11	8
1996, NSS	25	3	49	13	9
1999, NFHS	25	3	47	16	10
2000, MICS	21	4	53	14	8
2001, CoI	22	4	49	16	8
2006, NFHS	16	3	56	14	11
2008, DLHS	20		52	16	12
2009, NSS	10	6	55		30

Source: World Health Organization-UNICEF Joint Monitoring Programme, 2010; National Sample Survey Office (NSSO), Ministry of Statistics & Programme, GoI 2010.

Note: CoI= Census of India; DLHS= District Level Health Survey; MICS= Multi-Indicator Cluster Survey; NFHS= National Family Health Survey.

iii. Sources, Types of Schemes and Associated Institutional Arrangements

There are two broad types of RWSSs: (a) those that draw on local sources; and (b) those that require water transfer. The former are more likely to depend on groundwater with associated household-level arrangements being hand pumps, tube wells, wells, stand posts and household connections (the latter two via piped water schemes). At least 80-85 percent of the Indian rural population depends on schemes that draw on local groundwater sources (DDWS, 2007; Lok Sabha Secretariat, 2009). Schemes that require water transfer are more likely to depend on surface water sources with associated household-level arrangements being stand posts and household connections. Less than 15-20 percent of the rural population depends on such schemes.

Institutional arrangements (Table 2) for schemes that draw on local sources are relatively

less complex. Responsibilities for planning, implementation, monitoring and O&M, including tariff-setting and revenue collection, of these schemes rest between the GPs and PHEDs; capital costs are borne by central and state governments.

In schemes that require water transfer, WRDs typically play the role of bulk suppliers and transmission agencies. They sell water to the PHEDs or ZPs (the bulk retailers), which in turn sell it to the GPs (the retailers). The GPs sell the water to the final consumers. Prices are determined by the sellers. Thus, the WRDs set prices for PHEDs or ZPs; the PHEDs or ZPs set the prices for GPs; and the GPs set the prices for consumers. O&M responsibilities for their portions of the storage and transmission (WRDs) and distribution network (PHEDs/ZPs and GPs) rest with the sellers. Capital costs for bulk water storage and transfer as well as RWSSs are borne by the central and state governments via the WRDs and PHEDs

Table 2: Institutional Arrangements for Rural Water Supply

Source	Groundwater	Surface Water
% of population served	80-85%	15-20 %
Household Arrangements	hand pumps, tube wells, stand posts/household connections	stand posts/household connections
Capital Expenditure	state and central governments	state and central governments
O&M	PHED and GP/ZP	WRD, PHED/ZP, GP

at the state level; and their counterpart ministries (Ministry of Water Resources and MDWS) at the GoI level.

iv. Challenges

However, despite the movement on the water ladder over time and significant past and on-going public investment, there are causes for concern. Thus:

- In 2009, about 10 percent of India's rural population was estimated to depend on unprotected sources (NSSO, 2010). It is likely that this figure is under-estimated given that estimates of India's rural population dependent on unprotected sources in 2000-08 ranged from 16 to 22 percent (World Health Organization-UNICEF Joint Monitoring Programme 2010). Even if the 2009 estimates are assumed to hold, an estimated 83 million individuals (the Census of India, 2011, reports India's rural population at about 833 million) may be dependent on unprotected sources;
- In 2010, about 22 percent of India's rural population was estimated to receive less than 40 litre per capita per day (lpcd) of water (DDWS, 2010). This could imply that about 183 million

rural Indians receive less than 40 lpcd of water currently. According to state-specific studies/assessments, the proportion of rural population not receiving adequate water supply may be higher;

- In 2009, about 14 percent of India's rural population was estimated to be experiencing water shortages at some point in time in a year (NSSO, 2010). This could imply that about 117 million rural Indians experience water shortages currently. Again, according to state-specific studies/assessments, the proportion of rural population experiencing water shortages may be higher; and
- Of India's 1.66 million rural habitations, about 434,000 (roughly 26 percent) do not have their entire population covered and about 130,000 (about 8 percent) report chemical water quality issues (DDWS, 2010).

Continued dependence on unprotected sources, inadequate supplies, seasonal shortages and quality issues, despite significant public investment, have commonly been traced to issues around source and system sustainability⁵ (DDWS,

⁵This is manifest in the fluctuating rural habitation coverage figures over time. The proportion of fully covered rural habitations in India has been reported at about 33 percent in 1997 (about 476,000 habitations), about 13 percent (about 189,000 habitations) in 2001, about 42 percent (about 637,000) in 2003 and about 26 percent (about 434,000 habitations) in 2010. Some of these changes may also be ascribable to the emergence of new rural habitations.

2010; Lok Sabha Secretariat, 2009; Planning Commission, 2010):

- Instances of water sources running dry or water quality being affected (source sustainability); and
- Schemes not performing to expectations on account of inadequate O&M (system sustainability).

Source Sustainability: Rural water supply in India depends mainly on groundwater and even though drinking water accounts for only 1 percent of groundwater use, stress on groundwater resources impacts schemes and supplies (Lok Sabha Secretariat, 2009). As reported by the DDWS to the Standing Committee on Rural Development (2009-10) for the 15th Lok Sabha, ‘despite increasing investments, the infrastructure created for drinking water gets negated as...the source has been depleted due to other sectors or...the service population has increased...(and) there is a general reluctance...(among)...states for pricing of water and regulation of its extraction’ (Lok Sabha Secretariat, 2009). It is against this backdrop that NRDWP emphasises conjunctive use of ground, surface and rain water and a mix of interventions around protection and augmentation of groundwater sources, revival of traditional sources, rainwater harvesting and regional schemes that may necessitate bulk transfer.⁶

System Sustainability: System sustainability has been impacted by inadequate O&M, traceable, in turn, to limited community engagement in the planning and implementation of schemes despite policy directions to the contrary, and limited willingness of PRIs to levy and collect user charges. Thus, according to various studies/assessments:

- Schemes have typically been planned and implemented without substantive community engagement. Though GP representatives may have an influence on the location of schemes,
- consultations on tariff-related issues occurred in only a fifth of the GPs surveyed
- only a fourth of the GPs report VWSCs
- less than 1 percent of the respondents are aware of the VWSCs’ existence (Planning Commission, 2010)

In such circumstances, where communities remain largely unaware of their own role and obligations towards O&M of rural water supply infrastructure owing to inadequate community engagement, a sense of community ownership vis-à-vis rural water infrastructure is rare; and O&M suffers on account of the dependence on others (concerned departments, PRIs, etc.). A five-state evaluation of RGNDWM⁷ suggests that inadequate O&M accounts for about half the non-functional hand pumps—30 percent of the total hand pumps in the states (Planning Commission, 2010); and

⁶ However, the movement towards surface water sources may have cost and time implications. Again, as reported by DDWS to the Standing Committee on Rural Development (2009-10) for the 15th Lok Sabha, ‘while developing surface water sources, since only a minor portion of this water resource is used for drinking, the sector is not able to justify huge transport of water from distant sources...(and)...has to wait for...(the)...development of the irrigation sector to access the water for its projects’ (Lok Sabha Secretariat, 2009). Major and medium irrigation projects in India, on the other hand, have been known for their time (and cost) over-runs. The estimated irrigation potential created during the 10th FYP (2002-07) and in the first three years of the 11th FYP (2007-12) was a little over half of what was targeted (Ministry of Water Resources, 2007; Planning Commission, 2010).

⁷ Evaluation Study on Rajiv Gandhi National Drinking Mission (RGNDWM), Programme Evaluation Organisation, Planning Commission (GoI), November 2010.

■ Only 12 percent of the GPs collect user charges (DDWS, nd). Moreover, more than 90 percent of respondents consider the government responsible, and are unwilling to pay, for O&M of RWSSs (Planning Commission, 2010). In 2007, the annual O&M cost of RWSSs was estimated at about Rs. 65.7 billion and funds available were estimated to meet less than 20 percent of this requirement (DDWS, 2007). At around this time (2007), the NSSO estimated that India's rural households pay an average of Rs. 2 per month per capita on account of taxes and cesses⁸ – about 0.2 percent of the monthly per capita expenditure (NSSO, March 2010). Even if the entire amount paid by rural Indian households by way of taxes and cesses were to be used for O&M of RWSSs, it would meet only 30 percent of the total O&M costs.

B. Alternate Institutional Options for O&M

With the NRDWP prioritising household-level water security and movement up the water ladder (that is, working towards adequate and safe water supply through household connections), massive investment, aimed at responding to both system and source sustainability issues, is proposed for rural drinking water supply in the coming years. The sector's human and financial resource needs, including those for O&M, are likely to increase significantly with such investment. Increased O&M requirements emerge amidst widely observed concerns in relation to O&M of even the existing infrastructure, emanating from capacity

and financial constraints among PRIs and staff shortages and labour issues among PHEDs.⁹

These constraints have meant that O&M of existing infrastructure has suffered on account of lack of technical staff and expertise within PRIs; limited human resources available with PHEDs to either support PRIs or undertake O&M themselves; and reluctance among both PRIs and PHEDs to introduce and collect user charges. Importantly, it is the quality of services available to households that has been compromised and, unless human and financial resource constraints currently in evidence are addressed, it is likely that the significant investments proposed in the sector in the coming years would remain at risk.

A case then emerges for reflecting on alternate arrangements for O&M that ensure appropriate and timely preventive, operational and corrective O&M through dedicated, qualified staff at reasonable cost. It is in this context that alternate options for undertaking O&M of RWSSs, particularly through non-state providers, are being considered in some states by PRIs and PHEDs. It is expected that alternate arrangements would lead to operational and cost efficiencies with implications, *inter alia*, for: (a) scheme efficiency and longevity, which is critical for ensuring that efforts towards ensuring water security and source sustainability translate into an improved experience in terms of service quality at the household level; and (b) the O&M cost burden, which is important to reduce, given the challenges in levying and collecting user charges at the community level and the resultant demands on the central and state governments.

⁸Taxes and cesses include both 'water charges' and 'other consumer taxes and cesses'.

⁹PHEDs in several states have not witnessed staff hiring in the past years and have tended to engage contract/daily wage staff to respond to increased work requirements. However, staff shortages imply challenges in even supervision of contract/daily wage staff. Further, such staff has often sought regularisation of services in time.



Through this study, three such options for the management of rural water supply services through engagement with non-state providers of services have emerged. These options, organised in order of increasing involvement of the non-state agency in system development and management, are:

- Mandating and empowering community-based entities such as self-help groups (SHGs) for provision of services through Memoranda of Understanding (MoUs);
- Instituting registered societies/trusts (formed among the resident population), dedicated to providing water supply services and operating on a profit or not-for profit basis; and
- Engaging a service provider through a simple O&M contract.

The adoption of any one option is influenced by the particular context of the settlement and water supply scheme, including the size of the settlement; geographic context; economic profile; available capacity within community groups and their inclination to undertake services; age, condition and complexity of the RWSS; household willingness to pay for service; etc. This list is by no means exhaustive, and while Table 3 captures a few factors that impact relevance of any option to a context, these are indicative only and not prescriptive.

Moreover, it is possible for any one village to exercise a choice between several options, for example, a peri-urban village of 7,500 population, in which reasonable technical capacity is available and households are willing to pay for services, may opt for a Community Based Organisation (CBO) model (trust or society) or an operator-led management option. The choice must lie with the community for, as indicated in Table 3, community concurrence of any option is a critical enabling factor in successful implementation.

Conversely, it is also foreseen that any one option may be applicable across different contexts, for example, an O&M contract to a private entity seems viable at a certain scale.¹⁰ This may be satisfied by a single settlement or a cluster of smaller settlements. No one rule is applicable to all, and the availability of a menu of options increases the possibility of a good fit between context and arrangement for O&M.

Each option is documented through a case study (presented in Chapter 2) and conclusions on the characteristics of the options and their applicability as well as key learnings from across the options are captured in the concluding section. It is hoped that this study stimulates further reflection and discussion on the appropriateness of, and potential way forward with regard to non-state providers in the O&M of rural drinking water supply schemes.

¹⁰ Several sources indicate a population of at least 20,000 as a threshold criterion.

Table 3: Options for Engaging Non-state Providers in Management of Small Piped Water Supply Schemes

Option/Model	Relevant Cases Documented in the Publication	Relevance to Context/ Applicability	Enabling Factors
SHG	<p>Khambegaon (Case Studies)</p> <ul style="list-style-type: none"> • Single-village scheme (Coverage: population 1,314; area 56,672 hectares) 	Small, isolated settlements (approx. 1,500-3,000 population); simple schemes	<ul style="list-style-type: none"> • Capacity building inputs • Buy-in from all stakeholders/community • Clear agreement for services
CBO (registered trust, society, etc.)	<p>Chinchali (Case Studies)</p> <ul style="list-style-type: none"> • Single-village scheme (Coverage: population 26,000; area 80.47 square kilometre) • VWSC was registered as a society 	Small and large villages (5-15,000 population), good technical capacity within the community	<ul style="list-style-type: none"> • Clear agreement for services, with powers to fulfil mandate • Transparency, community monitoring
O&M contract	<p>Morinda, Punjab (Case Studies)</p> <ul style="list-style-type: none"> • Multi-village contract (22 schemes cover 51 villages) • Coverage: population approximately 35,000 	Large villages, or a cluster of small villages, providing sufficient scale of operations (over 20,000 population)	<ul style="list-style-type: none"> • Community concurrence • Clear agreement allocating roles and responsibilities • Hiring of local staff • Effective redeployment of department staff • Incentives for augmenting household connections • Metering • Community monitoring

Case Studies

A. Operations and Maintenance of Village Water Supply Systems through Women's Self-Help Groups: Khambegaon, Parbhani District, Maharashtra

Overview

In June 2007, under the World Bank-supported Jalswarajya Project in Maharashtra, Khambegaon village (population: 1,314) in Parbhani district entered into an agreement with a women's self-help group for O&M of the village water supply scheme. The main objective of the engagement was to ensure efficient collection of water taxes, since over 90 percent of households in the village were served through house connections. In addition to all O&M activities, including collection of water

taxes, the SHG was to meet payments for power consumed and maintain updated records of water accounts. Eighty percent of the revenue from water tax collections was to be retained by the SHG to meet operational expenses and 20 percent handed over to the GP, to be maintained in a fund to meet expenses related to system improvements.

Over a three-year engagement, the SHG hired a technician to operate the system and achieved 100 percent recovery of water tax demand, resulting in a small profit. However, its effectiveness was hampered by the lack of technical and financial capacity as members, being illiterate, were unable to maintain records. By 2010, the village Sarpanch (head), aided by the technician and the GP peon, had taken over system operations.

Figure 1: Location of Thane, Jalna and Parbhani Districts



The initiative was replicated in about 124 GPs under the Jalswarajya Project, with mixed results. Among the constraints to successful scaling up, the lack of clear contracts/agreements; insufficient buy-in from all stakeholders; weak capacity building inputs; and inadequate support are identified as the most critical.

i. Background

Maharashtra is the second most populated state in India with a population of 112.37 million.¹¹ Its rural population (54.77 percent) is spread across 33 rural districts and 98,842 habitations. Over 85 percent of RWSSs in the state are groundwater-based and face increasing problems of source depletion. Approximately 56 percent of households access drinking water through taps (community and/or individual connections)¹² but only 3 percent of house connections in the state are metered. Reform measures adopted by the Water Supply and Sanitation Department, Government of Maharashtra, to enhance sustainability of water supply schemes include source strengthening, provision of 100 percent house connections and a focus on single-village schemes.

Moreover, the state government, in its attempts to fully decentralise water supply services, has made GPs responsible for execution as well as O&M of single-village Piped Water Supply Schemes (PWSSs) costing up to Rs. 5 crore (approximately \$0.92 million). The GP is to undertake O&M of the water supply system through its VWSC.¹³ The VWSC is assisted by the village water person,¹⁴ employed by the GP; and the Gram Sevak, a government staff employed at the GP level to collect taxes.

In January 2003, the Government of Maharashtra took a policy decision to discontinue direct and indirect subsidies for O&M of RWSSs. GPs were made responsible for fixing appropriate water taxes that would cover the costs of routine O&M. However, despite such bold policy initiatives, VWSCs' capacities to manage water supply schemes continue to remain weak and the long-term sustainability of rural water supply systems has been a cause of concern. Several capacity-building measures have been carried out on a continuous basis but have not yielded significant outcomes in terms of improved services. About 10 percent of habitations record slippage in service levels annually on account of increasing demands that are not being met, source sustainability issues and poor O&M practices. GPs are grappling with problems of poor tax collections,¹⁵ inadequate maintenance and resultant poor service levels.

The Maharashtra Water Supply and Sanitation project—Jalswarajya—was implemented across 26 districts over the period 2005-11. To address the issue of poor O&M, the project suggested a menu of service providers that could potentially be engaged by GPs for undertaking implementation and/or O&M of the 2,298 RWSSs constructed or rehabilitated under the project. These included:

- Community-level service providers, including para professionals from the village, experienced in construction such as masons, plumbers, etc.;

¹¹ Census of India 2011.

¹² Project Concept Note, Jalswarajya-II.

¹³ Subject Committee of Gram Panchayat as per Bombay Gram Panchayat Act 1958.

¹⁴ Also called the GP peon. His salary is generally paid partly from the house and health taxes and partly from government grants received by the GP.

¹⁵ In majority of the schemes, water tax collection by GPs is less than 70 percent of demand.



- CBOs, including Mahila Mandals, Yuvak Mandals, SHGs and their federations; and
- Public (Maharashtra Jeevan Pradhikaran, ZPs) and private service providers.

Amongst these, the involvement of women's SHGs in the management of village water supply systems was promoted as part of the women's empowerment component included in the project. This was first attempted in Khambegaon village and was quickly picked up by the then Sarpanch of the GP, who was considered progressive and proactive. Subsequently, the model was replicated in 124 GPs across 22 districts. The rationale for seeking women's

involvement derived from the recognition of their role as primary stakeholders in water supply—and therefore their interest in ensuring sustainable operations. In addition, elected representatives (GP members) were facing difficulties in adopting tough measures required to ensure financial sustainability of water supply systems (disconnections, appropriate cost recovery tariffs, etc.). It was felt that transferring this role to an entity outside the elected body would facilitate implementation. Also, the Gram Sevaks, traditionally entrusted with the responsibility of water tax collection, were constrained in undertaking regular follow-up with households to ensure payments.



Khambegaon village, comprising 172 households and a total population of 1,314,¹⁶ is located in Purna block, Parbhani district, Maharashtra. The GP, comprising two villages (Khambegaon and Mahadpuri), is spread over 56,672 hectares.

ii. Scheme Details

The water supply scheme in Khambegaon was constructed under the Jalswarajya-I Project, at a cost of Rs. 29.79 lakh (\$55,164) of which the GP contributed a little over 10 percent. The scheme

was commissioned in May 2007, 18 months after start of construction.

The scheme draws water from a public well located approximately 1.5 kilometre (km) from the village, and includes an Overhead Service Reservoir (OHSR) and 750 metre (m) of distribution network divided into three zones to ensure supply at adequate pressure. Water is supplied twice a day from 6-7 am and 5:30-6:30 pm. Daily supply averages 60 lpcd. However, this may decrease to 30 lpcd in summer months due to frequent and long power cuts. Supply is staggered in the three zones with each zone getting approximately 15-20 minutes of water supply.

Individual household connections were promoted under Jalswarajya-I and 157 households (91 percent) in Khambegaon have house connections. A connection deposit of Rs. 100 was collected from each household, while material expenses were borne by the households. The number of household connections has increased from 135 to 157 since the scheme was commissioned in 2007. Installation of meters for all house connections was initiated in 2011 and, by June 2012, 100 house connections had been metered.¹⁷ The new system has significantly reduced the hardships of women who used to carry water from distant local sources.

iii. Process and Terms of Engagement

During preparation and implementation, Jalswarajya facilitated increased interactions between the GP, women's groups and villagers through meetings to promote community participation in the project.¹⁸ As a result, 13 SHGs

¹⁶ Census 2011.

¹⁷ The cost of installing meters was funded through a government grant. While 100 house connections have meters, these households are not yet paying the water bill based on the water consumed but continue to pay the flat tariff.

¹⁸ This eventually helped strengthening of Gram Sabhas in terms of improving their participation and transparency.

were formed in Khambegaon village and nurtured to promote women's economic activities in village development.

As most households in the village had house connections, regular collection of water tax was recognised as a major step towards ensuring sustainability of the water supply system. It was also felt that women's involvement in this function would ensure higher recovery of water taxes. The VWSC (with 12 members), which had been active during the construction phase, was perceived to have no further role in O&M. Consequently, on 1 May 2007, the Gram Sabha passed a resolution handing over billing and collection to Sailani Baba Bachat Gat,¹⁹ one of the SHGs²⁰ in the village, on the basis of its readiness to undertake the task and the high cost recovery promised by it. Subsequently, regular O&M of the water supply system was also handed over to the SHG. An agreement, incorporating the following terms and conditions, was signed by the GP with the SHG on 25 June 2007:

- Roles and responsibilities of SHG:
 - O&M of the water supply system, including pumping mains, OHSR and the distribution system
 - Purchase of chlorine and administration of dosages for water purification
 - Payment of electricity bills

- Collection of water tax and maintenance of updated records of collection
- Response to complaints related to system repairs
- Sharing of revenue:
 - 80 percent of the revenue collected from the water tax to be retained by the SHG and 20 percent given to the GP²¹
- Water tariff:
 - A monthly charge of Rs. 30/household for all households with house connections

Significantly, the then Gram Sevak—who was previously entrusted with collection of water taxes—did not approve the arrangement and did not sign the resolution.

It was understood that the SHG would employ a competent person to carry out valve operations and repairs in the system. The GP peon (or village water man), who was earlier involved in valve and pump operations in the old system, would continue to operate the pump at the source well but would not be involved in the operation of the distribution system.

To prepare them for their role, the SHG members were taken on exposure visits to Ralegan Siddhi,²² Hivre Bazar²³ and a few other villages in October 2005 using the Information, Education and

¹⁹ The SHG has 12 members, all of them illiterate.

²⁰ Only seven SHGs are functional at present.

²¹ The amount that is made available to the GP has been used for undertaking system improvements such as installation of valves in the distribution zones.

²² The village of social activist Anna Hazare, who demonstrated holistic development of the village through community participation.

²³ The village of Popatrao Pawar, who successfully demonstrated the concept of community-led water resources management.



Communication funds available under the project. The SHG also received training on water quality monitoring and surveillance in 2007. However, there is no evidence that the SHG, or the water person engaged by it, received any training on technical and financial aspects of managing the water supply system. Thus, with limited technical knowledge on repairs, the SHG relied on the advice and intervention of the Sarpanch.

iv. Current Status in Khambegaon

There is anecdotal evidence to support the understanding that the SHG continued to be involved in O&M (through its water man) and water tax collection till 2010.²⁴ However, the arrangement was subsequently discontinued. Discussions with the Sarpanch and other GP members revealed that while the SHG had made a very valuable contribution by motivating

households to pay water taxes regularly, it was unable to manage financial records and accounts as its members were illiterate, and had not received any training related to this function.²⁵ Also, since the village is small and the scheme relatively new, the water man alone was able to respond to complaints and undertake repairs required. Thus, after the initial drive for water tax collections, the SHG's involvement was not leading to further value addition. At present, the Sarpanch, with the help of the person engaged by the SHG and the GP peon, undertakes the O&M of the scheme. He maintains accounts for water tax collections and monitors the O&M of the system on an informal basis through regular interactions with all stakeholders (water man, GP peon and households). Households report that water supply is reliable, except during the summer months on account of frequent power cuts.

²⁴ Till 2010, the water bills were issued in the name of the SHG. However, following an objection to this by some households the receipts were issued by the GP.

²⁵ No records were maintained by the SHG.

Table 4: Receipts and Expenditure for Khambegaon Water Supply Scheme

Details	Financial Year 2008-09	Jan-Dec 2011
Total no. of households	140	172
No. of house connections	135	157
Water tax demand (Rs.)	48,600	53,100
Receipts		
Water tax (Rs.)	48,600	53,100
Expenditure		
Salary of village water person (Rs.)	9,000	24,000
Electricity bill (Rs.)	5,000	5,000
Purchase of bleaching powder (Rs.)	2,880	1,400*
Minor repairs/other expenses (Rs.)	6,000	4,500
20% amount to the GP (Rs.)	9,720	10,620
Total expenditure (Rs.)	32,600	45,520
Total profit (SHG)	16,000	7,580

*50 percent cost is subsidised by the government in the form of reimbursement to the GP.

Source: Sarpanch, Khambegaon Village.

v. Water Tax Recovery

The involvement of the SHG in water tax collection has been the primary factor in motivating households to pay water taxes regularly. In addition, an advance water tax of Rs. 180 or \$3.3 (for six months @ Rs. 30 per month) had been collected at the time of granting connections as security against non-payment of water bills. Initially, the SHG had conducted meetings and door-to-door interactions to sensitise households on the importance of paying taxes for the sustainability of the water supply system. During this initial collection drive, the SHG was able to collect 90 percent of the water tax demand. In 2008-09, the recovery was 100 percent. However, in 2010-11, when the Sarpanch (through the village water man) collected water taxes, recovery was lower at 94 percent.

As presented in Table 4, water tax collections through both the SHG and GP have been resulting in a surplus after meeting all stated O&M costs. (However, it was not assessed that O&M expenditure was adequate to system requirements for sustainable operations.)

vi. Government of Maharashtra's Policy Initiative on Involvement of SHGs

About one year after the agreement in Khambegaon had been signed, the state government issued a resolution (GR dated 7 June 2008) to promote similar initiatives across the state for O&M of single-village as well as multi-village schemes. The policy suggests that GPs can enter an agreement with interested SHGs. The SHGs will collect water taxes, 80 percent of which may be retained by the SHG to meet O&M expenses such

as the salary of the village water person, electricity bills, minor repairs, cost of bleaching powder, etc. The balance 20 percent is to be deposited in the GP's Water Supply Fund. In case of major repairs (not defined in the resolution), the GP is to make additional funds available to the SHG.

While the model has had little uptake outside of the project villages, it was replicated in 124 GPs across the 22 districts covered by the Jalswarajya Project.

vii. Initiatives with SHGs in Other GPs

A few initiatives in other project districts were also assessed, to broaden the understanding of the role and status of SHGs in water supply services. The other GPs visited include Kambare and Uchat in Thane district and Surangali and Hiwarabali in

Jalna district. In Hiwarabali, the GP decided that the VWSC would undertake the O&M of the new water supply system, including water tax collection. Hence, the details of Hiwarabali are not included here. An overview of water supply systems in all other GPs is presented in Table 5 and roles and responsibilities shared at the GP level are summarised in Table 6.

Thus, in two of the villages studied, namely, Khambegaon and Kambare, the SHG was involved both in O&M and collection of water taxes at inception. In both villages, the SHGs were undertaking functions related to O&M through technical resource persons employed by them. In the other two villages (Uchat and Surangali), the SHG's role was limited to water tax collection.

Table 5: Functions of Water Supply Management across GPs*

Village	O&M				Water Tax Billing and Collection	
	Pump Operations	Valve Operations	Repairs	Water Disinfection	Billing	Collection
Khambegaon	GP peon	SHG-hired technician	SHG-hired technician	SHG-hired technician	SHG	SHG
Kambare	SHG-hired technician	SHG-hired technician	Plumber (hired)	Volunteer from PHD	GP	SHG
Uchat	GP peon	GP peon	Plumber (hired)	GP peon	GP	GP/SHG (partially)
Surangali	GP water man	GP water man	GP water man	GP water man	GP	SHG

*Based on the role of the SHGs agreed at the time of their engagement in respective villages.

Table 6: Key Characteristics of SHGs Involvement in Rural Water Supply in Villages Assessed

Village (District)	Number of Households (Population)	Number and % of House Connections	Year of Commissioning	GP Resolution Involving SHGs (Date)	Functions Performed by the SHG at the Time of Engagement	Period of Engagement of SHG	Water Tax Collection: Sharing	SHGs' Current Functions
Kham-begaon (Parbhani)	172 (1,314)	157 (91%)	2007	1 May 2007 plus contract signed with SHG on 25 June 2007	Water tax billing	2007-10	75:25 changed to 80:20	Not involved now
					Water tax collection			
					Engagement of technician for minor repairs and water disinfection			
					Payment of electricity bills			
Kambare (Thane)	107 (506)	73 (68%)	2009	6 December 2010	Water tax collection	Dec 2010 to date	Voluntary service	Same functions continue today including major repairs
					Engagement of technician for minor repairs			
					Payment of electricity bills			
Uchat (Thane)	135 (546)	130 (96%)	2009	No resolution	Water tax collection (partial)	2009 to date	Voluntary service	Same function continues today
Surangali (Jalna)	490 (2,600)	116 (23%)	2008	No resolution	Water tax collection	3 months	80:20	Not involved now

Note: All schemes draw water from open wells and include pumps (typically 5 HP); elevated storage reservoirs (20-40,000 litre); and a piped distribution network.



viii. Impact and Observations

As is evident from the review of initiatives in these four villages, the key impact of engaging SHGs in the O&M of water supply schemes has been to ensure household commitment to meeting water tax. Villages in which the involvement of SHGs has been well-supported by both the GP and households, and has continued for a significant period—such as in Khambegaon for nearly three years or in Kambare since December 2010—water tax collection is reported to be about 95 percent. Significantly, in both villages, O&M was clubbed with water tax collection, linking services to payment. This may have played a role in the high rates of collection reported. In terms of actual O&M services, however, the SHGs relied on hired technicians, and played a largely supervisory role.

The review also highlights the following factors as enablers in ensuring that arrangements with SHGs for O&M services in RWSSs are effective:

(a) **Buy-in from key stakeholders:** In

Khambegaon and Kambare, where SHGs had the support of the GP—as evidenced through resolutions—and the community, they were able to provide meaningful services over a significant period. On the other hand, in Surangali, the engagement lacked acceptance from both the GP and households, and the SHG withdrew within three months of its engagement.

Cultural factors may have played a role in the acceptance accorded to SHGs. Since the service provided in Kambare and Uchat (Konkan region) was voluntary, it may have gained greater acceptance among households,

whereas the collection sharing approach followed in Surangali and Khambegaon (Marathwada region) was viewed as commercial and objected to (especially in Surangali). Thus, it would seem that the acceptability of community-based entities assuming a commercial role may be limited. As a result, while they may constitute a good interface with the community, they also face a challenge in converting this into a sustainable commercial engagement.

However, this hypothesis requires further validation. What is certain is that the SHGs' effectiveness is contingent upon the acceptance of all households in the village, and the GP plays an important role here. Moreover, a clear mandate (point (c) below) also plays a facilitative role.

- (b) **Adequate capacity-building inputs for the SHGs:** In all cases, the only inputs provided to the SHGs comprised exposure visits to other villages in Maharashtra where communities had been involved in village development. No specific training was provided on technical or financial aspects. This lapse was further compounded by the lack of education among a majority of SHG members. Given that the water supply systems were new and fairly simple, the SHGs managed technical aspects of O&M (where mandated) through local technicians or plumbers. The absence of technical competence, however, posed limitations, as demonstrated in Khambegaon, where the Sarpanch soon dominated the O&M functions. In addition, all SHGs found it challenging to maintain even simple records

related to water tax collections, resulting in poor record-keeping during the period of their involvement.

- (c) **Clear mandate or agreement between the GP and SHG:** While the GP resolutions in Khambegaon and Kambare constituted an agreement between the GP and the SHG for O&M of the water supply system, it focussed largely on tasks to be undertaken by the SHG. The role of other stakeholders (GP peon, GP) and accountabilities were not delineated. GPs have tended to remain silent partners, with a passive approach towards the mandate given to the SHGs. Moreover, the terms of the agreement, particularly concerning revenue sharing, are not made widely known among all households as, for example, in Surangali, where households suspected that the SHG was making money from the agreement, and refused to pay the water tax to them.
- (d) **Sustained support to the initiative after the project period:** The Jalswarajya-I project came to an end in 2010-11 and staff (gender specialists) and non-governmental organisations who were supporting the SHG initiative were withdrawn after barely two to three years of engagement in the villages. This was just as the initiative was picking up, and support was most needed. The lack of an exit strategy created a vacuum, since the initiative had failed to build institutional linkages to support the SHGs further. In combination with the lack of capacity-building inputs, this precluded the initiative from taking root in a sustainable manner.

B. Empowering Community-based Entities through Memoranda of Understanding: Chinchali Village, Belgaum District, Karnataka

Overview

On completion of the PWSS in Chinchali village (population: 26,000), North Karnataka, O&M responsibilities were handed over to the GP, and subsequently transferred to the VWSC. Recognising the limitations of its effectiveness, particularly in recovering water charges, the VWSC registered as an independent society in 2008, and signed an MoU for water supply services with the GP. The MoU clearly lays down the mandate of the society with regard to O&M, including billing and collections, financing extensions of the distribution network, and water quality testing, while assets vest with the GP, which approves new connections and determines tariffs. The society retains all income from user charges for the purpose of meeting operational expenditure.

By April 2011, the society was recovering 90 percent of revenue demand, and had accumulated savings of over Rs. 126,000 (\$2,333). Institutional positioning of the O&M function, in combination with greater transparency, has played a central role in the success of the arrangement.

i. Background

Over 61.43 percent of Karnataka's total population of 61.1 million²⁶ resides in rural areas of the state. While the state has achieved significant success in providing a basic minimum service level for drinking water supply (40 lpcd) to most of its rural population, it faces several challenges in ensuring operational and financial sustainability in the water supply sector.

²⁶ Provisional Population Tables, Census, 2011.

Figure 2: Location of Chinchali Village


In October 2000, the Government of Karnataka adopted a sector reform strategy that focusses on a demand-responsive approach, cost recovery and further phased devolution of rural water supply service delivery responsibility to GPs and VWSCs.²⁷ At present, the O&M of all Mini Water Supply Schemes, PWSSs and Hand Pump Schemes has been transferred to GPs/VWSCs.²⁸

In order to ensure financial sustainability of RWSSs, the state government issued a directive in November 2002 for state-wide revision of tariff (Rs. 25 per month for house connections and Rs. 10 per month for public stand posts), and has issued guidelines on collection of water tariff from users. As a part of its efforts to strengthen O&M of RWSSs, the state government also provides an annual maintenance grant for O&M of RWSSs to GPs (@ Rs. 3,500 for Mini Water Supply Schemes, Rs. 8,000 for PWSS and Rs. 600 each for hand pumps).

The Chinchali water supply scheme is a single-village scheme supplying piped water to the village of Chinchali located in Raibagh taluka, Belgaum district, Karnataka. The village is spread over an area of 8,047 hectares and has a population of approximately 26,000²⁹ (about 4,300 households).³⁰

Prior to 1994, village households were compelled to carry water from River Krishna located approximately 3 km away. This changed with the development of the first PWSS under the World Bank-assisted Integrated Rural Water Supply and Environmental Sanitation Project in 1994. Constructed at a cost of Rs. 7.3 million, the scheme was subsequently augmented in 2001-02 under the second World Bank-assisted Jalnirmal project.

²⁷ This sought to deepen implementation of the Karnataka Panchayati Raj Act 1993, which stipulates O&M of RWSSs as one of the statutory responsibilities of GPs.

²⁸ Source: Karnataka Rural Water Supply & Sanitation Agency.

²⁹ As per Census 2001, the village had a population of 15,949.

³⁰ Assuming an average household size of six.

ii. Scheme Details and Process of Engagement

The scheme sources water from River Krishna through a jack well, and provides for treatment through a slow sand filtration process. Treated water is pumped to seven OHSRs and supplied every day for an hour between 7 am and 8 am. As on April 2011, the system supplied approximately 900 house connections³¹ and 25 public stand posts in the village. Households that do not have house connections either use public stand posts or share private connections.

The Chinchali piped water supply system is operated and maintained by an independent society. Post implementation of the Jalnirmal project, the O&M of the water supply scheme was handed over to the GP. However, the GP was neither able to recover tariffs nor control illegal connections. In 2003, O&M responsibility was transferred to the VWSC which had been established under the Jalnirmal project.³² While the VWSC was able to put in place an efficient and transparent management system, it met with stiff resistance from some households—particularly affluent and politically influential households—which were reluctant to pay for water. The VWSC felt constrained in issuing notices to defaulters or undertaking disconnections. In view of this, it was decided to create a separate legal entity, distinct from the elected body (GP) to handle O&M of water supply. As a result, in 2008-09, the VWSC was registered as an independent society under the Karnataka Society Act, and renamed the Krishna

Drinking Water Supply and Rural Development Society. The society entered into an MoU with the GP for O&M of the village water supply scheme. It is constituted of the same 14 village leaders who were previously members of the VWSC. Society members are not remunerated for their services.

To obtain a house connection, households submit an application to the society along with an upfront connection charge of Rs. 60, and a refundable deposit of Rs. 500. All applications are reviewed by the GP, which grants approvals following a review of the scheme's capacity. Subsequent to the GP's approval, the society's authorised plumbers install the connections while households bear material costs. The amount collected as upfront connection charge is deposited in a fixed deposit by the society.

The current water tariff is Rs. 60 (\$1.1) per month for house connections³³ and Rs. 10 (\$0.18) per month for public stand post users.³⁴ While tariffs may be reviewed by the GP every year on the basis of a budget forecast prepared by the society, no tariff revisions have been made in the last five years.³⁵

iii. Key Terms of Engagement

The MoU between the GP and the Krishna Drinking Water Supply and Rural Development Society clearly outlines the roles, responsibilities and powers of both parties.

³¹ There were only 394 house connections in 2001, which increased to 810 in 2007; 92 new connections were installed during the period 2008-11.

³² Under the project, the VWSC was entrusted with the responsibility of community mobilisation.

³³ As compared to the state-wide prescribed rate of Rs. 25/household connection/month.

³⁴ The MoU recommends that households using public stand posts be allowed to fill only two water pots per day.

³⁵ It has not been felt necessary to review tariffs so far (interview with officer in the District Support Unit, Belgaum, World Bank-supported Jalnirmal project, July 2011).

The GP is the owner of the assets while the society is responsible for operations, repairs, maintenance, expansion, and billing and collections.

The society is required to prepare an O&M budget by March every year and submit it for approval of the GP. The society may also propose revisions in water tariff, if deemed necessary. Additionally, it is required to submit details of income and expenditure to the GP every month, and to the community (in the form of printed leaflets) once a year.

The society retains all income from user charges for the purpose of meeting monthly expenditure including salaries, electricity bill, consumables and repair charges. All money collected as upfront connection charges is maintained as fixed deposits, to be used only as bank guarantees for raising loans for further extensions of the scheme.

iv. Impact and Observations

Financial performance: Since 2008, when the society took over the O&M of the scheme, its income (including government grants, which

range from 9 to 14 percent) has exceeded total expenditure, resulting in accumulated savings of Rs. 1,26,507 (\$2,333) as on 1 April 2011 (Figure 3 and Table 8).

User charges from house connections and stand posts account for approximately 86 percent of the annual income. Government grants account for less than 14 percent of total income and 15 percent of expenditure, across the three financial years. In addition, the total collections from upfront connection charges, kept in fixed deposits and used for major repairs/extensions, amounted to Rs. 51,750 (\$958) in 2009. The society raises 100 percent of the bills and collection efficiency, at 90 percent of demand, is quite high.

Institutional positioning of the O&M function:

Discussions with the community reveal that while the VWSC was competent in managing the water supply system, it faced difficulties in fulfilling its mandate appropriately due to frequent interference. The establishment of the society, adequately empowered to undertake functions vested with it, has greatly facilitated O&M of the system.

Table 7: Roles and Responsibilities of the GP and the Society

Roles and Responsibilities	
Gram Panchayat	Society (Operator)
Owner of all water supply assets	O&M of the RWSS, including water treatment plant and storage reservoirs
Approvals for new connections	Undertaking all minor repairs within 24 hours ³⁶
Fixing and revising tariff	Billing and collection
	Financing extension of the distribution line to facilitate new house connections
	Water quality testing on a regular basis

³⁶ No penalty is specified for failure to meet this. In case of major repairs, the GP is to provide assistance.

Figure 3: Income and Expenditure: Krishna Drinking Water Supply and Rural Development Society

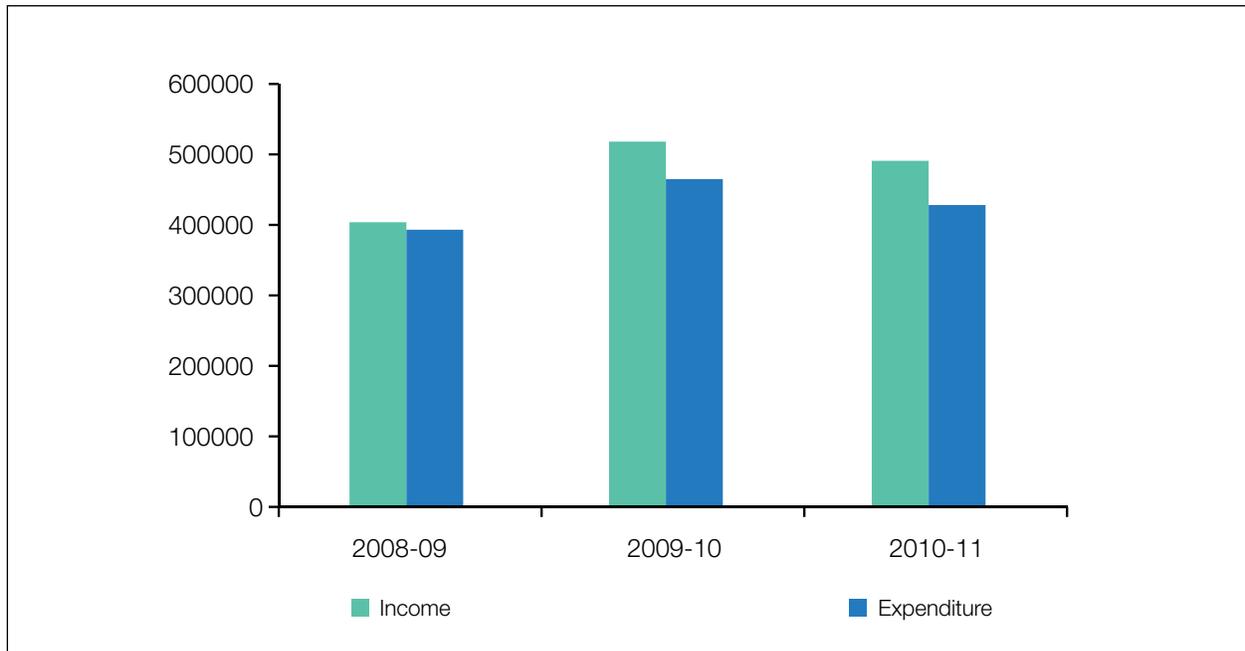




Table 8: Income and Expenditure of the Krishna Drinking Water Supply and Rural Development Society (2008-09, 2009-10, April-December 2010)

S. No	Head	2008-09		2009-10		2010-11	
		Amount	%	Amount	%	Amount	%
A	Income						
1	User charges						
(a)	Household connections	3,49,890	86.97	4,31,010	83.42	4,20,448	85.90
(b)	Stand posts	15,010	3.73	14,700	2.85		
2	Interest income	300	0.07	0	0.00	7,707	1.57
3	Grants	37,132	9.23	70,934	13.73	61,298	12.52
	Income Total	4,02,332	100	5,16,644	100	4,89,453	100
B	Expenditure						
1	Salaries and administration	88,500	22.59	1,12,272	24.22	1,23,530	28.95
2	Electricity	1,94,538	49.66	2,37,079	51.15	2,49,439	58.45
3	Repairs	1,03,018	26.30	89,621	19.34	49,265	11.54
4	Consumables	5,650	1.44	24,495	5.29	4,515	1.06
	Expenditure Total	3,91,706	100	4,63,467	100	4,26,749	100
	Savings/surplus	10,626		53,177		62,704	
	Total Savings					1,26,507	
	Grants as % of income	9.23		13.73		12.52	
	Grants as % of expenditure	9.48		15.31		14.36	
	Operating ratio (Expenditure/Income)	0.97		0.90		0.87	

Source: Krishna Drinking Water and Rural Development Society, Chinchali village.

Note: No assessment was made of whether O&M expenditure was adequate to system requirements for sustainable operations.

“ನೀರು ಅತ್ಯಮೂಲ್ಯ ಈಗ ಪೋಲು ಮಾಡಬೇಡಿ ನಂತರ ಬೇಡಬೇಡಿ”

• ದಿನಾಂಕ : 01-04-2009 ರಿಂದ 31-03-2010 ರ ವರೆಗಿನ ಜಮಾ-ಖರ್ಚು •								
ಕ್ರ.ಸಂ.	ವಿವರ	ಜಮಾ	ಕ್ರ.ಸಂ.	ವಿವರ	ಖರ್ಚು	ಕ್ರ.ಸಂ.	ವಿವರ	ಶಿಲ್ಕು ಹಣ
1.	ಪ್ರಾರಂಭದ ಶುಲ್ಕ	71326-00	1.	ವಿದ್ಯುತ್ ಬಿಲ್ಲ	237079-00	1.	ಗ್ರಾಮೀಣ ಬ್ಯಾಂಕ್	96499-00
2.	ದಿವಾಜೀಟಿನಿಂದ ಬಂದ ಹಣ (86x500)	43000-00	2.	ಸಾಮಗ್ರಿಗಳ ಖರೀದಿ	45026-00		ಖಾತೆ ಸಂ. 5727 -	93377
3.	ಕನೀಕ್ಷಣ ಬಾರ್ಡ್‌ನಿಂದ ಬಂದ ಹಣ (86x60)	5160-00	3.	ಪೈಪ್‌ಲಾಯಿನ್ ಲೇಔಟ್ ಹಾಗೂ	27230-00		ಖಾತೆ ಸಂ. 5036 -	3122
4.	ಅರ್ಜಿ ಫಿಯಿಂದ ಬಂದ ಹಣ (86x5)	430-00		ಟ್ಯಾಂಕರ್‌ಗಳ ಸ್ವಚ್ಛತೆ ಆಳುಗಳ ಪರಿಶೋಧನೆ				
5.	ಕರಪಟ್ಟಿ ವಸೂಲಿಯಿಂದ ಬಂದ ಹಣ (ಎಪ್ರಿಲ್ 2009 ರಿಂದ ಮಾರ್ಚ್ 2010 ರ ವರೆಗೆ)	431010-00	4.	ಪಂಪ್ ಮೋಟರ್ /ಪ್ಯಾನಲ್	17365-00	2.	ICICI ಬ್ಯಾಂಕ್ ಖಾತೆ ಸಂ. 1858	2039-00
				ಬೋರ್ಡ್ ರಿಪೇರಿ				
			5.	ಆಯಿಲ್ ಮತ್ತು ಬ್ಲಿಟ್‌ಂಗ್ ಪಾಪಡರ್	6670-00	3.	ಕೈ ಶುಲ್ಕ	5399-00
6.	ಗ್ರಾಮೀಣ ಬ್ಯಾಂಕ್ ಮುದ್ದಾತಿ ಶೇವು	345000-00	6.	ಪ್ರವಾಸ ಭತ್ಯೆ	17825-00			
7.	ಬ್ಯಾಂಕಿನಿಂದ ಬಂದ ಬಡ್ಡಿ	40001-00	7.	ಸಿಬ್ಬಂದಿ ವೇತನ	96600-00			
	ಗ್ರಾಮೀಣ ಬ್ಯಾಂಕ್ ಖಾತೆ ಸಂ. 5727	39538	8.	ಪ್ರಿಂಟಿಂಗ್ ಖರ್ಚು	4600-00			
	ಗ್ರಾಮೀಣ ಬ್ಯಾಂಕ್ ಖಾತೆ ಸಂ. 5036	147	9.	ಜಾಕ್ಯೆಯ ಖರ್ಚು	6400-00			
	ICICI ಬ್ಯಾಂಕ್ ಖಾತೆ ಸಂ. 1858	316	10.	ನೀರಿನ ಬ್ಯಾಂಕ್ ಖರೀದಿ	120000-00			
			11.	ಸ್ವೇಚ್ಛನಿ ಮತ್ತು ಇತರೆ	4472-00			
8.	ಮುದ್ದಾತಿ ಶೇವು ಸಾಲ	150000-00	12.	ಗ್ರಾಮೀಣ ಬ್ಯಾಂಕ್ ಮುದ್ದಾತಿ ಶೇವು	388000-00			
9.	ICICI ಬ್ಯಾಂಕ್ ಜಮಾ	302000-00	13.	ICICI ಬ್ಯಾಂಕ್ ಖರ್ಚು	312723-00			
		1367927-00			1283990-00			103937-00

ಬಿ. ಸೂ. : ಅನಧಿಕೃತವಾಗಿ ನಶ ತೆಗೆದುಕೊಂಡಲ್ಲಿ ಅಂತಹವರಿಗೆ ರೂ. 5,000/- ಲಂಡ ದಿಫಿನಿಷನ್‌ನಲ್ಲಿ ಮತ್ತು ಕಾನೂನು ಪ್ರಮಾಣಿತವಾಗಿರುತ್ತದೆ.

Sample Income and Expenditure Statement as issued by the society.

Thus while willingness and competencies may exist at the local level, it is important to ensure that these are housed in a manner that enables and facilitates operations.

Accountability and transparency mechanisms:

The arrangement has enhanced the transparency of water supply functions. The society is required to share income and expenditure details with the GP every month, and with customers every year. Further, the basis for tariff-setting and revision, being the budget proposed by the society, is objective/rational.



C. Engaging Private Contractors for Operations and Maintenance: Morinda Block, Rupnagar District, Punjab

Overview

Faced with a shortage of staff, Department of Water Supply and Sanitation (DWSS), Punjab, contracted out O&M of 22 small PWSSs covering 51 villages (population: 35,000) through a single contract to a locally-based firm in December 2010. The operator, selected through a bid, was to undertake all functions related to operations, excluding billing and collections and payments for power consumption, responsibility for which was retained by DWSS. The contract also emphasised an increase in house connections through checking illegal use of water. The operator was compensated directly by DWSS on a monthly basis, but was required to obtain a certification of satisfactory services from the communities before release of payments. Hiring of local staff such as pump operators was also a contractual requirement.

At the end of the contract period in March 2011, the operator had improved levels of service significantly, reduced operational expenditure by 20 percent and added 720 new house connections, resulting in an increase in revenue demand by 20 percent. The contract, however, was not renewed, reportedly largely on account of opposition from departmental staff. The initiative demonstrates the potential for service improvements and cost savings through outsourcing undertaken through a transparent bid process.

i. Background

Punjab, with a population of 27.7 million (including a rural population of about 17.3 million),³⁷ is among India's more prosperous states. While it reports access to improved drinking water sources for most of its rural population, the O&M of the state's 5,100³⁸ RWSSs remains a concern. Traditionally, the design and implementation of RWSSs in the state has been the responsibility of DWSS, Government of Punjab. However, as a part of the Sector Wide Approach advocated under the World Bank-supported Punjab Rural Water Supply and Sanitation Project, responsibilities for O&M have been devolved to Gram Panchayat Water Supply and Sanitation Committees (GPWSSCs) in about 1,100 schemes with mixed results. In addition, DWSS, Government of Punjab, responsible for the remaining schemes, has been constrained in discharging its O&M functions due to field staff shortages arising from retirements and a long-standing restriction on fresh staff recruitment. The DWSS has explored contracting of labour for O&M tasks but the option has not always yielded desired results owing to high absenteeism and difficulties in supervision.

In Morinda block, where O&M responsibilities of RWSSs rest with DWSS, persistent concerns over the quality of O&M amidst staff shortage led to the consideration of the outsourcing option. The idea was encouraged by the departmental leadership as a pilot initiative. Communities, dissatisfied with the poor O&M situation, were sceptical but inclined to see how the 'experiment' would fare.³⁹ Anticipating a challenge from employee unions,

³⁷ Census of India 2011.

³⁸ As on 1 April 2010.

³⁹ The option of handing over the schemes to the GPWSSCs was not exercised in the light of the past experience with handover of schemes in the state. Further, it was felt that, should the experiment work, it could prepare the ground for tripartite (and, in time, bilateral) contracts between contractors, DWSS and GPWSSCs.

Figure 4: Location of Morinda Block



the departmental field staff was relocated before the initiative was taken forward. The extent to which staff relocation could be achieved, together with the need to provide a contiguous service area for bidders, was a critical factor that influenced the size/coverage of the O&M contract package.

ii. Scheme Details and Process of Engagement

The O&M contract extends to 22 of 30 functional tube well-based, small PWSSs in Morinda block: four single-village schemes and 18 multi-village schemes, each covering two to four villages. The schemes cover 51 of 71 villages in Morinda

block, with an estimated 5,700 households and a population of about 35,000 (approximately half the estimated population of Morinda block).⁴⁰ Prior to outsourcing, 3,516 households (62 percent) reported unmetered house connections; others, district-level data suggest, are likely to have had their own private tube wells.

All schemes covered under the O&M contract are relatively new, constructed post 2000, with 10 constructed after 2005. All schemes are located within a radius of 10 km from the block headquarter and cover an area of about 374 sq km. All but one have a design capacity of 40 lpcd.⁴¹

Following the Departmental Notification of Tender in September 2009, bids were invited through a three-envelope, single-stage selection process. The tender documents were prepared in-house by the DDWS and the entire procurement process was managed by a Tender Processing Committee, comprising two Executive Engineers and a Sub-divisional Engineer. The pre-qualification criteria were based on both annual turnover—fixed at Rs. 15 lakh for each of the last three years—and prior experience of ‘similar’ projects.⁴² Four bids were received of which two met the criteria and were shortlisted. In their submissions, the bidders commonly mentioned the following concerns:

- They should not be held responsible for disruption of service on account of a decline in tube well yields or erratic power supplies. This was conceded by DWSS, as tube well yields had been tested for sustainability;

⁴⁰ The present rural population of Morinda block is estimated to be 70,000. As per Census 2001, the rural population of Morinda block was 63,696; the present population has been estimated by applying the state rural average growth rate projected by Census of India in 2006. The number of households was estimated by dividing the estimated population by the average household size (6.1) as per Census 2001.

⁴¹ Only one scheme has a design capacity of 70 lpcd.

⁴² Prior experience of either three similar projects of contract value not less than Rs. 20 lakh each or two similar projects of contract value not less than Rs. 25 lakh each or one similar project of contract value not less than Rs. 40 lakh.

- They should not be held responsible for any major damage to machinery, structures, etc. Costs of repairing these should be borne by DWSS. DWSS accepted this;
 - The requirements of performance security (5 percent of contract value, refundable a month after contract completion) and retention money (another 5 percent of contract value deducted in instalments from running bills, refundable six months after contract completion) should be reconsidered. DWSS declined to address this as such provisions are considered standard practice; and
 - Payments should be made by the fifth day of each month so that pay-day (seventh day of each month) obligations could be met; the bidding documents provided for payments in equal monthly instalments by the 15th day of each month. This was changed, and the final contract provides for payments by the 7th day of the subsequent month.
- Supply of water to each village twice a day as per the timings agreed with DWSS and GPWSSCs;
 - O&M of pumping machinery, excluding replacement of pumps;
 - Repair of pipelines and leakages;
 - Provision of all necessary spares and consumables;
 - Regular chlorination at the water works and disinfection of OHSRs;
 - Checking illegal water use and reporting it to GPWSSCs (in actual practice, this was reported to DWSS operational staff); and
 - Deployment of necessary staff.

In discharging these obligations, the contractor is to abide by all O&M procedures of DWSS, applicable labour laws and safety regulations, ensure equitable water distribution, and maintain appropriate records.

Following DWSS's response, the two technically compliant bidders submitted fresh cost estimates and the contract was awarded for a period of one year beginning 1 December 2009, to Envirocure Projects Private Limited⁴³ at a contract value of Rs. 4.5 million, payable in equal monthly instalments.

DWSS is responsible for revenue collection from consumers and payment of electricity charges. The latter function was retained by DWSS due to apprehensions about service disruptions in the event of non-payment of charges by the contractor, and concerns about compromising the contractor's liquidity situation. Though not stipulated in the contract, the private contractor is informally involved in the revenue collection function. Water bills are generated at the sub-divisional offices of DWSS, and are taken by the contractor to scheme locations. Consumers collect the bills from the

iii. Key Contract Terms

There are three main stakeholders, namely, the private contractor, DWSS and GPWSSCs (representing the villages).

The obligations of the contractor extend to all aspects of O&M, including:

⁴³ Envirocure, a private limited company with a reported annual turnover of about Rs. 200 million, began operations in 1990 and is primarily engaged in the execution of civil, electrical and mechanical works for water and sanitation infrastructure in Punjab. It has recently extended its work to other states.

contractor and most prefer to pay directly to the contractor who, in turn, deposits the collections at sub-divisional offices, collects receipts and distributes them at the scheme locations.

The GPWSSC is to advise the contractor on matters of supply timings, oversee the contractor's working and point to issues that need redress. The release of contractor's payments is subject to certification of satisfactory service by the GPWSSCs.

Further, the number and qualifications of staff to be deployed is to be decided in discussion with DWSS, GPs and GPWSSCs. Preference is to be given to local residents for the position of pump operators. In addition, monthly salary payment is to be made by cheque in the presence of a DWSS representative.

The contractor is also the authorised DWSS plumber for installing new house connections to consumers who have received DWSS sanction for installation. Rs. 100 (\$1.85) per house connection is payable to the contractor for this service. Prior to handover of the infrastructure, the contractor was required to identify the number of legal connections⁴⁴ and disconnect illegal connections.

Penalties are payable by the contractor for failure to provide services. Thus: (a) if water supply is not restored within eight hours for reasons other than power failure, the contractor is penalised Rs. 500 per eight hours; (b) where a replacement pump is needed but not made available within 48 hours, the contractor is penalised at Rs. 2,000 per day; (c) a penalty of Rs. 200 per day per shift is payable in instances of absence of workers from duty; and (d) a penalty of Rs. 2,000 per month is

payable if works are not maintained to the Executive Engineer's satisfaction. Moreover, the contractor is to provide mobile telephone numbers of key staff and maintain a complaints register at the water works. All disputes are to be referred to the Superintending Engineer whose decision, acting as the arbitrator, is final in respect of disputes referred to her/him.

Each scheme has a dedicated pump operator and, in addition, a centralised mobile team, equipped with essential spares and tools, that serves all schemes. The team comprises three supervisors, an electrician and a fitter.

The initial contract between DWSS and Envirocure concluded on 30 November 2010 and was extended for a period of three months. DWSS did not exercise the option, available under the contract, of extending the contract for a period of two to three years. According to discussions with the private contractor, this can be attributed largely to resistance from the department staff union, which opposed the initiative. The DWSS staff union was also perceived as instrumental in instigating pump operators engaged by the contractor to agitate for additional remuneration for extra hours put in for pumping when electricity supply was erratic.

iv. Impact and Observations

The experience in Morinda has contributed to encouraging results in terms of improvements in service quality and cost savings.

- **Improved services and increase in house connections:** Among the major benefits reported by community representatives are more regular pumping and supplies, prompt restoration of supplies after pump motor damage and faster

⁴⁴ The verification process revealed that there were 3,516 legal connections in the villages covered by the contract.

response to complaints of pipeline damage/leakage. These are reflected in:

- An increase in the number of house connections (720 numbers, raising the proportion of households with house connections in the service area from 61 to 74 percent);
- A reported decline in the number of breakdowns (from 16 during the period 1 April 2009–31 March 2010 to nine over the period 1 April–31 December 2010); and
- An increase in the duration of water supply (from two to three hours prior to outsourcing to four to five hours).
- **Direct cost savings:** Prior to outsourcing, DWSS was incurring an annual cost of about Rs. 6.2 million or \$114,815 (excluding repairs and consumables) for the O&M of the 22 schemes,

which has declined to Rs. 4.5 million or \$83,333 (including repairs and consumables) after outsourcing (Table 9). In addition, there are as yet un-estimated savings on account of reduced electricity charges (due to lower pumping requirements following timely repair of pipeline leakages) and spend on major repairs.

However, despite these savings, revenue demand from consumers represents barely half the O&M costs and, even with the high revenue collection efficiencies in the area, existing tariff rates⁴⁵ would have to be doubled at current levels of house connections if communities are to meet O&M costs entirely. Assuming 100 percent house connections, meeting O&M costs entirely from communities would still require a 1.7 times increase in tariff.

Table 9: Comparison of Annual O&M Expenditure Prior and Post Outsourcing

EXPENDITURE	Prior to Outsourcing	Post Outsourcing
Salaries (Rs. lakh)	62.00	25.20
Repairs and consumables (Rs. lakh)	N.A.	20.00
Electricity costs (Rs. lakh)	25.00	25.00
Total expenditure for O&M	87.00	70.20
<i>ESTIMATED REVENUE DEMAND</i>		
No. of connections	3,516	4,236
Monthly tariff–house connections only (Rs.)	70	70
Revenue demand (Rs. lakh)	29.53	35.58
% of O&M expenditure addressed by revenue demand	33.9%	50.7%

Source: DWSS representatives; Envirocure representative.

⁴⁵ As a part of its policy to graduate towards full O&M cost recovery for RWSSs, the Government of Punjab has undertaken periodic revision of tariffs (about once in two years) from 2003-04 onwards. In 2003-04, the water supply tariff for house connections stood at Rs. 50 for schemes with design capacity of 40 lpcd and Rs. 60 for schemes with design capacity of 70 lpcd. These have currently been revised to Rs. 70 per month for schemes with design capacity of 40 lpcd. There are no charges for stand posts.



Among the contract conditions that are believed to have resulted in positive change are:

- The requirement to engage local staff as pump operators, which has reduced absenteeism and permits pumping at odd hours if necessitated by erratic power supplies;
- The incentive provided to the contractor for rendering plumbing services for new connections in the form of a service charge of Rs. 100/connection, which has prompted the contractor to promote house connections. It is significant that most of the new connections installed during the contract period consisted of regularisation of existing illegal connections;
- The explicit requirement for the contractor to maintain a stock of standby pumps, which has meant that replacement of failed motors, often the most significant cause of long disruptions in service, is undertaken immediately;
- The explicit mention of standards of services and associated timelines and penalties, which has ensured that the contractor is clear of service obligations; and
- The need for the contractor to obtain a certification of satisfactory services from the GPWSSCs before release of payment, which has been a critical instrument in ensuring consumer accountability and responsive services.



In addition, two Government of Punjab decisions have further contributed to improvements:

- The reduction in house connection charges from Rs. 1,000 to Rs. 300 for Below the Poverty Line and Scheduled Caste households and Rs. 500 for other households; and
- The introduction of a grievance redressal system in December 2009, which allows consumers to register their complaints through a toll-free number (advertised at each water works). The complaint details are transmitted to the concerned staff at DWSS through a Short Messaging Service-based system. The system also allows for escalation of unresolved complaints to senior officials.

While the contracting initiative in Morinda was not continued, DWSS initiated a larger contract for O&M services in Bhunerheri block in Patiala district, which further validated the gains derived from the model. Details are captured in Box 1.

The key observations from the experience in Morinda and subsequently in Bhunerheri can be summarised as follows:

- Contracting terms that emphasise engagement of local staff; contain incentives, penalties and indicators for specified services; require preparatory measures for major causes of prolonged service disruption; and ensure accountability to the community – through

measures such as complaints registers and payments contingent upon community certification of services—can contribute to desired results;

- Clarity on the scope of work and liability for service disruptions on account of external factors (such as source sustainability or erratic power supply), the quality of infrastructure and the terms of payment impact levels of private sector interest;
- There is potential for cost savings with O&M outsourcing undertaken through a transparent bidding process. However, continued state support may be needed to bridge even the reduced O&M costs, unless accompanied by further attempts at introducing efficiencies through a mix of broader private sector engagement and tariff increases;
- The size of the contract package is critical: smaller contract packages may not draw sufficient operator interest while larger contract packages may not always be possible, particularly if the ground has to be cleared in terms of staff relocation (as was the case in Morinda). About 20 small PWSSs (approximately 5,000-6,000 households; 35,000 population) is considered optimal by both DWSS and Envirocure representatives;⁴⁶
- Challenges can be anticipated from staff unions. In Morinda, despite staff relocation undertaken

⁴⁶ A broad breakdown of Envirocure's costs suggests that the bulk (about 70-75 percent) of the costs incurred cannot be allocated to specific schemes and can be justified only at this scale.

Box 1: Contracting O&M of RWSSs in Bhunerheri Block, Patiala District

Following the initiative in Morinda, in January 2011, the O&M of 51 RWSSs, covering 104 villages (13,882 households) in Bhunerheri block, was contracted to a private operator (Envirocure Projects Private Limited) through a competitive bid, for a period of one year. The contract value, payable in 12 equal instalments, was Rs. 103.25 lakh. The key contract terms were identical to those of the contract in Morinda block.

All schemes are tube well-based small PWSSs, and 94 of 104 schemes were established post 2005. Only 2,418 household connections (17.41 percent) were reported at the inception of the contract. There are no stand posts. The following observations were made at the end of the contract period:

- The number of house connections increased by over 50 percent during the tenure of the contract —from 2,418 in December 2010 to 3,720 in December 2011. Most of this increase is attributed to regularisation of illegal connections. The village-level pump operator played a key role in collecting upfront connection fees and undertaking the required paperwork with the local DWSS office towards approval of new connections. However, the overall percentage of house connections remained low, at 26.8 percent in December 2011;
- Improved response time in case of breakdowns;
- Based on experience gained from the Morinda contract, the private operator put in place a team of ‘reliever’ operators to cover for pumping requirements at odd hours due to power outages; and
- The contracting arrangement does not seem to have resulted in cost savings for DWSS.

In January 2012, the single contract for the entire block was discontinued, and O&M of individual water supply schemes has been handed over to individual ‘C’ class (small) private contractors empanelled with DWSS. This may be attributed to resistance to contracting by DWSS staff, as well as lobbying by small contractors. While the impact on services is yet to be evaluated, the initiative has reportedly led to a reduction in costs incurred.

Source: Interactions with private operator, officials and frontline staff of DWSS, pump operators and households in two villages—Behal and Kathgarh—which were covered by the contract.



prior to the outsourcing initiative, the DWSS staff union was perceived as the main cause for discontinuation of the contract. Communities were more supportive; while initially sceptical, they were inclined to see how the experiment would fare;

- A supportive leadership and consumer-friendly measures at the state level are important in supporting the achievement of desired results. In both cases, the encouraging stance of the departmental leadership, and the decision of the state government to reduce house connection charges and introduce a toll-free telephone-based complaints redressal system, have played a key role in spurring house connections and ensuring responsive contractor services; and
- Given the initially encouraging results in Morinda and Bhunerheri, there may be further scope for incentivising better water

resource management through improved tracking of pumping volumes and leakages, and remunerating contractors based on a share of the savings achieved in volumes of extraction and leakages. (Currently, only hours of pumping are tracked.) Metering, however, would be critical for this. The policy thrust on enhancing house connection coverage in the state further strengthens the case for metering, and the Government of Punjab, in its Draft State Rural Water Supply Policy (2012), has proposed that all new domestic water connections must be metered with immediate effect. Besides encouraging efficient resource management, metering may ensure that water consumption of, and consequent revenue demand from, consumers is more accurately assessed and tariff rates are established on a sound base, without passing on the burden of inefficiencies to consumers and leading to potentially more manageable levels of state support.

Key Learnings and Takeaways

Taking an integrated approach to the country's rural water supply issues, GoI's NRDWP focusses on the key aspects of source and system sustainability. System sustainability is inextricably linked to both technical and financial aspects of operations of RWSSs.

A key plank of NRDWP's approach is the devolution of O&M functions to GPs, through the formation of VWSCs. This, however, has had mixed results, and the O&M of existing infrastructure has suffered due to lack of technical staff and expertise within GPs as well as the reluctance, among both GPs and PHEDs, to introduce and collect user charges.

The case studies in this report document emerging initiatives in India that have looked at alternate options to address some of these issues. While the drivers instrumental in the adoption of such approaches have been different in each case, the studies demonstrate that *non-state providers may more effectively be able to undertake functions that are central to the sustainability of rural water supply systems* than GPs or VWSCs, because the latter may be swayed by external considerations. Thus, in both Chinchali (Karnataka) and Khambegaon (Maharashtra), regular and efficient collection of water charges could be ensured; in Morinda and Bhunerheri (Punjab), a significant number of illegal connections could be legalised in a relatively short period. These objectives also constituted the rationale for engaging with the entities.

In all cases, responsibility or accountability for service provision continues to vest with the GP/department; only the actual activities associated with provision are outsourced.

Given the differing needs and requirements of communities across size, class, region/state, scheme type and specific local circumstance, the adoption and facilitation of several models may be more effective in ensuring a higher rate of success in meeting the objectives of sustainable O&M.

Delegation of O&M through a contracted entity (Morinda, Punjab) may be a viable option in select cases whereas empowering VWSCs as independent entities may be suitable in others (Chinchali, Karnataka) and SHGs may be appropriate in still other contexts. In all cases, sustainable and professional (technical and financial) management of O&M, whether through the VWSC or a contracted entity, remains the objective.

The profile of the potential operator in RWS services may vary significantly—ranging from societies and CBOs operating on a profit basis to individuals (plumbers), small firms and local contractors (Morinda, Punjab). Business sense, reasonable investment capacity, skill at managing relations with local government bodies, and ability to work closely with communities⁴⁷ are common requisites. Contracts would thus benefit from opening up to a wide profile of potential operators, by keeping bid processes and contract terms reasonably simple.

⁴⁷ Locally-based firms and individuals have an advantage.

While the initiatives documented are still very limited in spread and number, the study throws up some lessons, which point to measures required to ensure the success of such initiatives, regardless of the option chosen or the operator profile. These include:

Financial sustainability of small PWSSs is difficult to establish in a context where billing is undertaken on a flat rate basis. While all schemes studied aimed at supply through house connections, none had metering. In such a situation, cost recovery is possible only where hours of supply, and hence pumping volumes, are limited. Therefore, both in Khambegaon and Chinchali, daily supply is limited to one hour, and operational expenditure is fully recovered through revenue collections (excluding grants).⁴⁸ In both cases, a fund for repairs and replacements, and/or future expansion is also being maintained.

In Punjab, where daily supply is provided for three or four hours, collections barely meet 50 percent of estimated expenditure, reflecting higher consumption and expenditure.

Metering facilitates a record of actual consumption, and hence cost of provision to be maintained, particularly in schemes with a large segment of house connections.

A clearly-defined policy/guidance, detailing the modalities of cost recovery and maintenance through a combination of water taxes and state grants, would boost the confidence of non-state actors, and further deepen their meaningful engagement. An accurate determination of the costs involved, and a strategy for meeting them would allow adequate funds to be earmarked in order that:

- (a) Service standards may be specified;
- (b) Assets may be maintained at required/agreed levels; and
- (c) Strong performance incentives may be integrated in agreements with non-state providers to reduce costs further.

This would allow a gradual steering of RWSSs towards better service delivery as well as

Table 10: Household Connections, Tariffs and Expenditure/Revenue Demand in Three Study Schemes

Case	Number and % of Household Connections	Tariff (Rs./Household Connection/Month)	Expenditure/Revenue Demand (*)
Khambegaon (2008-09)	157 (91%)	30	0.66
Chinchali (2010-11)	900 (21%)	60	0.99
Punjab (post outsourcing)	4,236 (74%)	70	1.97

(*) excluding government grants, amounts maintained in funds for replacement, expansion, etc.

⁴⁸ Although it is difficult to assess whether systems are being maintained adequately, that is, maintenance costs are not under-reflected.

greater financial sustainability, with regard to both operations and asset replacement; it would also allow alternate sources of finance (lending institutions) to be tapped.

There is need for capacity building of all stakeholders, including households and GPs so that they may understand and support the mandate of the operators; and the operators themselves, to equip them with essential technical and financial skills. The failure of the SHGs is, in part, due to the failure to maintain simple accounts.

Even for the management of small systems, contractual relationships must be formalised in order to be effective, and there is a need to clearly define the roles and responsibilities of all stakeholders. Thus, in the case of Chinchali, Karnataka, the society was able to perform its functions with greater ease and effectiveness than the VWSC of the same composition, having been empowered through an MoU that: (a) established its identity distinct from the GP; and (b) clearly stated its mandate and relationship with the GP. In this case, both institutional location of the function and allocation of appropriate authority to carry out the mandate have contributed to more sustainable operations.

On the other hand, the lack of clear agreement—and adequate information to households regarding the arrangement—significantly hampered the work of SHGs in Surangali village in Jalna district, Maharashtra, as households were unwilling to pay user charges to SHG members.

Aligning incentives to objectives facilitates performance. In the simplest contracts, effective incentives that are in alignment with the

achievement of clearly identified and stated objectives will serve to facilitate performance. For example, in Morinda, Punjab, the operator was provided a cash incentive for each house connection added, with the objective of reducing illegal use of water and enhancing revenues. Within a year, a 20 percent rise in household connections and a concomitant increase in revenues were achieved.

Sustainability of the arrangement is inextricably linked to the extent of community buy-in and involvement. Thus, the SHGs were most effective in the two villages where they enjoyed the support of both the GP and households. On the other hand, arrangements failed where all stakeholders (including the community and other village functionaries) had not been adequately involved and informed of the decision to hand over the O&M of RWSSs to women's groups.

Similarly, in Morinda, Punjab, communities were required to certify satisfactory performance prior to release of operator payments. This key involvement ensured operator responsiveness to the community's felt needs, and established downward accountability. In Chinchali, Karnataka, the society is required to share details of revenue and expenditure statements on an annual basis with the community, ensuring that it is informed and engaged on a regular basis.

A supportive leadership and political will are required to address the resistance of existing department staff and other vested interests. In Morinda, Punjab, the departmental staff union was perceived as the main cause for discontinuation of the contract.



Annex I: Evolution of Government of India's Programmes in the Rural Water Sector

The first national water supply and sanitation programme was introduced under the first Five Year Plan (1951-56) as a part of GoI's health plan. In order to address problems related to rural water supply and sanitation, the state governments gradually built up their public health engineering systems. However, a majority of the RWSSs were being implemented in easily accessible villages while remote villages continued to face severe water scarcity.

In order to accelerate the pace of coverage of remote and inaccessible villages, GoI introduced the Accelerated Rural Water Supply Programme (ARWSP) in 1972-73. At this stage, the major thrust of RWS sector development was to "ensure provision of adequate drinking water supply to rural community through a centralised public health engineering system". The ARWSP was a first major push by GoI to boost rural water supply under which it provided full grant to state governments and Union Territories (UTs) for implementing water supply schemes in problem villages.

The entire programme was provided a mission approach with the creation of the National Drinking Water Mission in 1986. This was renamed as the Rajiv Gandhi National Drinking Water Mission (RGNDWM) in 1991. With the launching of the technology mission, the focus shifted towards tackling issues related to water quality, providing appropriate technology interventions, support for human resource development and other related activities. The Mission issued comprehensive guidelines for ARWSP (1986), helped formulate National Water Policies (1987 and 2002) and introduced the Sector Reform Project in 1999.

The Sector Reform Project was focussed on involving communities in planning, implementation and management of RWSSs. With this, it became the world's largest government-sponsored, demand-based and participatory drinking water supply programme, initially implemented in 67 districts across 26 states on a pilot basis. The SRP was scaled up in the form of Swajaldhara in December 2002 with the objective of covering the entire country by the end of the 10th Five Year Plan. Community participation was sought through 10 percent contribution to the total capital cost and complete responsibility.

The major challenges in the rural water supply sector identified during the 11th Five Year Plan included ensuring sustainability of water sources and systems; coverage of a large number of habitations that were currently uncovered/partially covered; water quality issues; and financing O&M on an equitable basis. Given this background, MDWS came out with modified ARWSP guidelines in the form of NRDWP on 1 April 2009. For the first time, in a major shift from habitation-based water supply norms adopted so far, the concept of drinking water security was introduced in the NRDWP guidelines. The major emphasis in the sector currently is on ensuring sustainability of water availability in terms of potability, adequacy, convenience, affordability and equity while also adopting a decentralised approach involving PRIs and community organisations. Adequate flexibility is afforded to the states/UTs to incorporate



these principles, taking into account all aspects of the sustainability of the source, system, finance and management of the drinking water supply infrastructure.

Investments in the Rural Drinking Water Sector

While provision of rural water supply is primarily the responsibility of state governments, the central government contributes a significant part of the programme funds for this sector. The total investment in the rural drinking water sector across the Five Year Plans is Rs. 158,272 crore. Of this, 46 percent has come from the central government and 54 percent is the contribution from state governments.

The funds made available by GoI have been increasing in absolute terms (from Rs. 34 crore in the fourth Five Year Plan to Rs 39,490 crore in the 11th). GoI's share of the overall investment has also been increasing from 14 percent in the fourth Five Year Plan to 44.63 percent in the 11th Five Year Plan.

Table 11: Investments made/proposed in Rural Drinking Water Sector by Central Government and State Governments under the Five Year Plans (1951-2012)⁴⁹

Plan period	Centre		State		Total (Rs. crore)
	Investments (Rs. crore)	%	Investments (Rs. crore)	%	
First (1951-56)	0	0	3.00	100.00	3.00
Second (1956-61)	0	0	30.00	100.00	30.00
Third (1961-66)	0	0	48.00	100.00	48.00
Fourth (1969-74)	34.10	14.09	208.00	85.91	242.10
Fifth (1974-79)	157.17	31.11	348.00	68.89	505.17
Sixth (1980-85)	895.38	36.91	1530.17	63.09	2425.55
Seventh (1985-90)	1905.64	43.54	2471.53	56.46	4377.17
Annual Plan (1990-91)	410.54	40.79	595.85	59.21	1006.39
Annual Plan (1991-92)	644.49	48.20	692.54	51.80	1337.03
Eighth (1992-97)	4139.74	44.88	5084.44	55.12	9224.18
Ninth (1997-2002)	8454.57	43.97	10773.11	56.03	19227.68
10th (2002-07)	16254.00	51.84	15102.00	48.16	31356.00
11th (2007-12)	39490.00	44.63	49000.00	55.37	88490.00
Total (1-11th)	72385.63	45.73	85886.64	54.27	158272.27

⁴⁹ Source: Mid-term Assessment of the 11th Five Year Plan.



Annex 2: List of Officials Interviewed for the Case Studies

1. Maharashtra Case Study

Elected representatives at Utchat, Surangali and Kambare

- Deepak More, Sarpanch, Utchat GP
- Sanjeev Patil, Ex Sarpanch, Surangali
- Vikas Sheru Barate, Ex Sarpanch, Kambare

Members of VWSCs

- Sushama Deepak More, Member Secretary of VWSC, Utchat and President of Samruddhi Bachat Gat
- Prakash More, President of VWSC, Utchat
- Ravindra Budhaji Pawar, Ex Deputy Sarpanch and Ex Chairman of VWSC, Khambare
- Shubhangi Bhoir, GP Member and Member Secretary of the Mahila Mandal, Khambare

Other GP-level officials

- Ramkrishna Koli, Gram Sevak, Utchat GP
- Eknath Barad, GP peon and substitute water man, Surangali
- Amol Kadam, Gram Sevek

Officials at district level

- Jyoti Thakerey, Member, Zila Parishad, Thane
- Dnyaneshwar Wankhede, resident of the village and representative of SEWA, a non-governmental organisation from Ahmedabad

SHG members

- Chitra Khonde, President of Kashi Vishweshwraya Bachat Gat, Surangali
- Pragati Prakash Bhoir, President of the Mahila Mandal, Khambare
- Kishor Bhoir, water man appointed by the Mahila Mandal, Khambare

Community representatives and households in the villages of Khambegaon, Khambare, Utchat and Surangali



2. Chinchali Case Study

- Lakkannavar, District Support Unit, Belgaum, World Bank-supported Jalnirmal Project

3. Morinda Case Study

- Representatives of DWSS, Government of Punjab:
 - o Daljeet Singh Bains, Executive Engineer
 - o L.K. Kauldhar, Chief Engineer
 - o N.K. Dhir, Superintending Engineer
 - o Pradyuman Singh, Junior Engineer
 - o M. Ravi Kant, Sub-divisional Engineer
- P.K. Gupta, Director, Envirocure Projects Private Limited
- Community representatives:
 - o Members of GPWSSCs in two villages—Chalaki and Doom Chheri

4. Patiala Case Study

- Representatives of DWSS, Government of Punjab:
 - o Sanjay Kumar, Secretary
 - o L.K. Kauldhar, Chief Engineer
 - o P. S. Bhatti, Superintending Engineer, WSS Circle—Patiala
 - o Jasbir Singh Aujla, Executive Engineer, WSS Division No. 2, Patiala
 - o Seema Sohal, Information, Education and Communication Specialist, Punjab Rural Water Supply and Sanitation Programme
- P.K. Gupta, Director, Envirocure Projects Private Limited
- Community representatives:
 - o Households in two villages—Behal and Kathgarh

Annex 3: Agreement between GP and Sailani Baba SHG for Operations and Maintenance of Piped Water Supply Scheme at Khambegaon Village, Maharashtra

Party receiving the agreement: Chairman Secretary
Rural Water Supply & Hygiene Committee, Jalswarajya
Project, Khambegaon
Tehsil Purna, Dist. Parbhani

Party writing the agreement: Chairman Secretary
Sailani Baba Women's Saving Group
Tehsil Purna, Dist. Parbhani

We, the Chairman and Secretary, Sailani Baba Women's Saving Group, Khambegaon, write this agreement that as per the decision made in the *Gram Sabha* on 1 May 2007, we are ready to take over the piped water supply scheme, which was completed under *Jalswarajya* Project, for maintenance and repairs. We are making this agreement according to the following terms and conditions passed in the *Gram Sabha*:

- A. 75% of the total water tax collected will be retained by the group and 25% amount will be given to the Gram Panchayat.
- B. Water tax will be Rs. 30 per month and connection deposit will be Rs. 100.
- C. The complete maintenance and repair work will be under the group, which will include the following:
 1. Paying the annual electricity bill
 2. The salary of *Jal Sewak*
 3. Purchasing and regularly using TCL powder
 4. Maintenance and repair of lift pipe and distribution system
 5. Ensuring water supply to the village at proper pressure
 6. Collecting water tax in the village
 7. Carrying out minor repairs immediately so that water supply is not interrupted
 8. Keeping all water tax collection documents up-to-date



The said agreement shall come into effect from 01/07/2007 (dd/mm/yyyy).

We hereby write the agreement that under the terms and conditions mentioned above, we will undertake the complete water tax collection and maintenance and repair work for the village water supply and ensure that the villagers are supplied pure and clean water regularly.

Signatories:

- Chairman Secretary, Water Supply & Hygiene Committee, Jalswarajya Project, Tehsil Purna, Dist. Parbhani
- Chairman Secretary, Women's Empowerment Committee, Jalswarajya Project
- Chairman Secretary, Sailani Baba Women's Saving Group, Tehsil Purna, Dist. Parbhani
- Sarpanch, Gram Panchayat, Khambegaon, Tehsil Purna, Dist. Parbhani



Annex 4: Memorandum of Understanding between GP and Krishna Water Supply and Rural Development Society for Operations and Maintenance of Drinking Water Supply Scheme

Agreement for the outsourcing of management of drinking water supply scheme

Memorandum of Understanding between the above-mentioned institutions regarding the handing over of the management of water supply scheme by the Gram Panchayat of Chinchali as per the resolution passed by the GP dated.....; with resolution nr.....; with the following terms and conditions:

Details of the assets created in the village under different programmes/schemes by the Government are as listed below:

1. Over Head Reservoirs

- i. OHSR of 2.5 lakh litres capacity (1 nr)*
- ii. OHSR of 3.5 lakh litres capacity (1 nr)*
- iii. OHSR of 3.0 lakh litres capacity (1 nr)*
- iv. OHSR of 3.0 lakh litres capacity (1 nr)*

2. Water Treatment Plant

1. *Raw water tank*
2. *Slow sand filter with storage tank*
3. *Clean/safe water reservoir*
4. *Pump house with motors of 10 HP, 35 HP and 7.5 HP*

3. Jack well with 45 HP pump near Krishna River

4. Raising main and distribution lines

The above-mentioned assets/facilities have been handed over to Krishna Water Supply and Rural Development Society for operations and maintenance for a three-year period, with the following terms and conditions:

General information/conditions for the community and Society

- Households shall submit an application for connection with the connection fee as prescribed; and the connection fee collected shall be kept in the Fixed Deposit (FD) account. Approval of the GP is necessary for any new connection.



- The committee shall decide on sanctioning of the connection based on the scheme capacity. Once the sanction is accorded the connection should be provided only by the authorised plumber/water person fixed by the committee/Society.
- House connection: The connection will be treated as a house connection only if someone lives in the house. Otherwise it will be treated as public tap use (in case of migration).

Technical details

- House connections shall not be given from the raising main in any circumstance
- All connections shall be only half-inch size
- All taps should be fixed at 0.5 feet height from the ground level
- Excess water/water spilled over shall not be allowed to flow into the roads (i.e., waste water should be properly drained out)

Checks and verifications

- All house connections should be accessible to the committee/Society or its representatives to inspect/check as and when required. The households should cooperate in this matter.

Use and disuse of the facilities

- The house connections/taps provided shall not be tampered with/alterd at any point in time
- No unauthorised operations shall be allowed at any point in time. Only authorised persons shall operate the systems
- No one should damage the public stand post or hand pumps. Washing cattle/clothes near the water points is prohibited
- No one shall quarrel/fight near the hand pumps/public stand posts. Everyone should stand in line in case of a rush. A household can fetch only two pots of water at a time
- Drinking water should not be used for construction work/gardening, etc.
- No one should waste water intentionally or unintentionally. Taps should be closed immediately after drawing water

Prohibitions/restricted activities

- Establishing illegal connections without the permission of the GP and VWSC
- Tampering of house connections (size of the pipes/saddle, etc.)
- Damaging of any facilities/infrastructure related to the water supply scheme
- Wastage of water intentionally or unintentionally
- Usage of drinking water for commercial/gardening activities
- Any activities affecting the public health
- Violating rules, which may lead to disputes with respect to water supply

Functions of the Society (Operator)

- Operations, repairs and maintenance of the water supply scheme and supply of quality water regularly as per the time fixed. In case of the major repairs, the GP shall provide assistance
- Revision of water tariff based on the requirement to meet the expenditure for providing sufficient water supply
- Preparing the annual O&M budget by March every year and submitting the same for the approval of the GP and the recovery of water tariff
- All repairs should be attended to within 24 hours
- Water supply connections should be given as per specifications under the supervision of the technical person from the operator's side
- Money collected as one-time connection fee should be kept in fixed deposits (FDs), without spending on O&M. However the interest earned on the FDs may be used for O&M purposes. Further, the FD shall be used as bank guarantee for raising any loans for expansions/repairs, etc.
- All maintenance activities such as backwashing of the Water Treatment Plant, change of filter media, cleaning of storage reservoirs, etc., should be undertaken as per specifications/requirements
- All wages, electricity bills should be paid regularly (every month)
- Details regarding the income and expenditure should be submitted to GP every year and shared among the community once in a year
- Extension of distribution line to facilitate new house connections, as required
- Water quality testing on a regular basis (twice a year)

Functions of GP

- GP is the owner of all the water supply assets
- Responsible for according permissions for any new water connections
- Approving, with necessary resolutions, revisions and fixing of tariff as and when necessary, with inputs from the Operator/Society
- Following the guidelines/circulars issued by Government of Karnataka

Both GP and the Society have agreed to manage the water supply scheme in Chinchali as per the terms and conditions mentioned above.

President/Secretary
Gram Panchayat, Chinchali

President/Secretary
Krishna Water Supply and Rural
Development Society

Signature of the GP members

Signatures of the members of the Society



Annex 5: Special Terms and Conditions of the Contract for Operations and Maintenance for Rural Water Supply Schemes in Block Morinda, District Ropar

1. First Party (Engineer-in-charge) authorises the Second Party (Contractor) to undertake full responsibility for the operations and maintenance of various rural water supply schemes in the block Morinda, District Ropar. These Rural Water Supply Schemes are functional entities. Necessary technical data for each of the schemes covered under the contract has been attached with this form. For all purposes in the contract, the operations and maintenance of any RWSS will mean as under:

“In an engineering sense, operations refer to hourly and daily operations of the components of a system such as plant, machinery, equipment, control valves, etc., which is done by an operator or his assistant. This is routine work. The term maintenance is defined as the act of keeping the plant, equipment, structures and other related facilities in optimum working order. Maintenance includes preventive maintenance or corrective maintenance, mechanical adjustment, repairs and planned maintenance.”

2. First Party (Engineer-in-charge)/DWSS will collect the revenue/user charges from the consumers in various villages covered under these schemes and deposit the same.
3. The contractor will undertake that water supply service is provided in a most satisfying way to all the villages covered under the scheme depending upon the availability of power.
4. The contractor will ensure near equitable distribution of water in various villages under the scheme, and also in the same village for difference households, by operation of sluice valves, etc., and setting variable supply timings. He will procure in writing from the representatives of the village/GPWSSC, in a register kept for this purpose every fortnight, a certificate in token of satisfactory water supply services in that locality/village. The said register will be produced by him in the office while submitting monthly bill for payment.
5. The contractor should strictly follow the procedure (Department rules) for operations and maintenance of RWS schemes as specified in the provisions under the act and rules and matters incidental thereto.
6. The contractor shall work within the framework of and be bound by all the provisions of the Rules and Regulations for the purpose of levy, assessment and repair of pipelines, structures, machinery, etc., as well as supervision of water works site and operations and maintenance of the various components of the water works and for all other works contingent thereto.
7. The Engineer-in-charge (Executive Engineer) or any officer appointed on his behalf, shall have the overall right, authority, control and supervision over the original work with a view to ensure that the schemes have been running satisfactorily without any hindrance or harassment to the public. The officer/officials of the Department shall also have the right and authority to inspect and check the schemes. The instructions/orders given by the Executive Engineer/officers from time to time in this regard shall be promptly complied by the contractor.
8. The contractor shall abide by the instructions and orders of the Executive Engineer and his subordinate officers during the period of contract.

9. Electricity Bills: The electricity charges for running of rural water supply scheme shall be borne by the Department. However the contractor will be responsible for
- (i) Receiving electricity bills at water works site from Punjab State Electricity Board (PSEB).
 - (ii) Sending the electricity bill in the Sub-Division Office for making timely payment to PSED.

The contractor will be held responsible for any sundry charges due to power factor; faulty shunt capacitor or any other undue charges levied by PSEB due to improper maintenance of electrical fittings and the recovery for the same will be made from the contractor's monthly bill.

10. It will be ensured by the contractor that no electric connection of any water supply scheme gets disconnected by the PSEB due to non-payment of electricity bill and the water supply is not disrupted due to non-payment of electricity charges.
11. Water connections: The contractor will be responsible to verify the number of legal water connections in the villages, which will be provided at the time of handing over the site to the contractor. The contractor will also identify illegal water connections at each scheme at the time of start of this contract. For illegal water connections, the contractor will collect information by house-to-house search and submit such lists to the Sub-Divisional Engineer.
12. The contractor will be responsible for disconnection of illegal connections, which will be disconnected by him in the presence of Sub-Divisional Engineer/Assistant Engineer of the concerned Sub-Division in the consultation with GPWSSC or Village Gram Panchayat of the concerned village with due notice for authorisation of the illegal connection as per prevalent Government Policy as applicable from time to time.
13. The contractor will act as an authorised plumber for the Department for making new water connections after due sanction from the competent authority and for issue of test report to the consumer. For making new connection and issuing of test report, the contractor will charge nominal fees of Rs. 100 from the consumer. All the material required for releasing a new water connection will be arranged by the consumer her/himself.
14. After award of contract, the contractor shall take over the scheme from the concerned Junior Engineer. The scheme will be handed over to the contractor in good running conditions AND after termination of period of contract the water supply scheme will be taken back in the same running condition.
15. The contractor will maintain the general upkeep of the contracted installation, which should look clean and aesthetic. The contractor will be responsible for the cleanliness of Pump Chamber, Staff Quarter, Machinery and the surrounding area at the water works. The contractor will maintain the greenery/plants at the water works including all the ornamental trees, other plantations, grass, hedges and flowers beds in good condition and will clear all the foreign grass and other unwanted wild matter from the lawns and other areas of the water works. The contractor will cut the grass and hedges at suitable intervals and will take care of the plantation in the best possible way. The contractor will use manure, fertilisers and limited use of insecticides/pesticides as may be required at the water works for the healthy growth of the plantation.



Contract Labour

16. The Second Party/Contractor will appoint his own employees for operations and maintenance of these schemes for rendering satisfactory services. The required manpower as and when needed shall also be deployed by the contractor.
17. Expert personnel and skilled/semi-skilled/unskilled workmen with adequate qualification and experience having appropriate level of acumen are required for the job. Such personnel/workmen/employees are to be inducted by the contractor to carry out the job to the entire satisfaction of the Department.
18. The contractor will be at liberty to appoint any number of employees for operations and maintenance of schemes, who shall be entitled to perform all the duties and functions for the operations and maintenance of rural water schemes. The employees will be recruited in consultation with the Department and GPWSSC/Gram Panchayat and it will be preferred that employees from the same village are engaged for running the water supply scheme. For optimum utilisation, one person can be responsible for number of services. **The contractor will ensure that, for all the time, at least one person remains available at the water works.** The staff employed shall be approved by the Engineer-in-Charge.
19. The contractor shall furnish information about the names and addresses of all the employees employed by him to the concerned Executive Engineer, on the 1st of every month and immediately whenever there is a change in employees due to resignation, removal, etc.

Minimum Wages

20. The contractor should ensure payment either equal or more than the minimum wages as notified from time to time for doing similar services by the State or Central Government. In other words, minimum wages as per the Minimum Wages Act, 1948, as revised to the skilled/unskilled workers should strictly be adhered to.

The payment will be made to the workers/employees of the contractor in the presence of an authorised representative of the Department. The monthly payment is to be made on the 7th day of the successive month through an account payee cheque.

21. All other acts/rules/regulations, by-laws, orders, notifications, etc., present or future, applicable to contractors from time to time for performing the aforesaid services shall also be applicable.
22. The contractor should obtain the necessary permission that may be required for the purpose of this contract from such authorities as may be prescribed by law from time to time.
23. The contractor or his supervisor should visit the site at least once in a week or as and when required by the Department for which no extra payment will be made as they should be readily available to the Department.
24. Any act of indiscipline/misconduct/theft/pilferage on the part of any employee engaged by the contractor resulting in any loss to the Department in kind or cash will be viewed seriously and the Department will have the right to levy damages or fine and/or even terminate the contract forthwith.

25. It shall be binding on the contractor to ensure that the persons employed by him are clearly given to understand in writing that they will have no right or claim for absorption in the Department at any time on any grounds. They will not be in any manner servants of the Department. Any liability, arising on this account, shall be directly that of the contractor.

It shall be the contractor's responsibility to protect his employees against accidents on the work. He shall indemnify the Department against any claim for damage or for injury to persons or property resulting from and in the course of work, and also under the provisions of the Workman's Compensation Act or any other laws. On the occurrence of any accident arising out of the works, which results in death or which is so serious as to be likely to result in death, the contractor shall, within 24 hours of such accident, report in writing to the Engineer-in-charge the facts, stating clearly and with sufficient details the circumstances of such accidents and the subsequent action taken. All other accidents on the works involving injuries to persons or damage to property other than that of contractor shall also be promptly reported to the Executive Engineer, stating clearly and with sufficient details the facts and circumstances of the accidents and the action taken. In all cases, the contractor shall indemnify the Department against all loss or damages resulting directly or indirectly in this behalf. In the event of an accident in respect of which compensation may become payable under the Workmen's Compensation Act (VII) of 1923 or any other act including all modification thereof, whether such compensation may become payable by the contractor or by the Department as principal employer, the party No. 1 may retain whole or part of the deposit due and payable to the such sum or sums of money as may, in his opinion, be sufficient to meet such liability. On receipt of award from the Labour Commissioner in regard to quantum of compensation, the difference in amount will be adjusted.

26. The contractor shall also make adequate provision of insurance for his own employees at his own cost to cover them against the risk of accident.
27. The workers employed by the contractor can use the facilities such as staff quarter, drinking water, toilet, etc., which have been provided at the premises. However, it should be ensured that the same should be kept in hygienic condition.
28. The workers will behave in a responsible manner and will be sufficiently trained for the assigned jobs. Further, they will be helpful in running the machinery/installation in economical and efficient manner. Any worker, whose work will not be satisfactory, will be removed from the installation and a new worker will be engaged by the contractor. The final authority for assessing the worker in every respect will be Engineer-in-Charge, i.e., Executive Engineer.
29. The First Party shall not in any way be responsible to the private workers for any misconduct, negligence, etc., of the employees engaged by the contractor. The Department shall not in any way be liable to pay the contractor any compensation on this ground. Nor shall the contractor have a right to claim the transfer of his liability to the Department, on the ground of misconduct, negligence or strike of the employees engaged by the contractor.
30. If the contractor desires to execute a part of scope of maintenance contract, which are very specialised in nature, by engaging a specialised competent group he will have to obtain approval from the Department authority furnishing all credentials and requirement of the manpower strength before the Department. However, the Department reserves the right to discontinue the same at its discretion.



31. Each worker will be **issued a photo identify card** which will show his name, father's name, residential address, date of birth, qualification, etc., and it will be kept available for inspection while on duty at various installations. Photo identity cards will be signed by the contractor and counter-signed by the Executive Engineer/Sub Divisional Engineer of the Department for authentication.
32. The workers will wear khaki uniforms while on duty. Each worker will be provided two number dresses (one summer and one winter) by the contractor.
33. The contractor will be **responsible for the safety of workers** while working for the Department. He will provide all safety tools and equipment and will take all precautionary measures to ensure the safety of workers.
34. **Responding to emergency situations:** The contractor will take appropriate measures to tackle any emergency situation in case of any accident at the work site.
35. The contractor will provide the Department a **contact mobile number** which will be available for 24 hours for attending any emergency work for the contracted installations.

Book Keeping

36. The contractor shall furnish information about the names and addresses of all the employees employed by him to the concerned Executive Engineer, on the 1st of every month and immediately whenever there is change in his employees due to resignation, removal, etc.
37. The contractor will maintain a **record of daily attendance** of workers at each installation separately, which he will produce with his monthly bill. The attendance record should be available at each installation for inspection by the Departmental officers any time.
38. **Log books** at each installation will be kept as per the format of the Department and as instructed by the Engineer-in-Charge.
39. The contractor shall maintain a record on a log book showing machinery repair record, repair of pipeline, etc., as per the operations and maintenance manual of the Department.
40. Service report and repair as well as spare changes reports shall be provided by the contractor showing the complete maintenance done on the equipment.
41. The contractor shall maintain a complaint register on every water supply scheme, so that a record of complaints is available to the Department.
42. The contractor will maintain the daily/weekly/monthly **preventive maintenance schedule** for the machinery as specified by the manufacturers of the machinery.
43. The following record will be maintained at site:
 - (i) Log book showing consumption of disinfectant agents.
 - (ii) Residual disinfectant Dose Testing Register and Water Quality Register showing the sample testing of water from various points/taps/stand posts of the village and also showing testing from various laboratories from time to time.

- (iii) Complaint Register at complaint centre to be displayed at water works.
- (iv) Site Order Book for getting orders from officers of the Department.
- (v) Status of water supply in villages for recording fortnight certificates from GPWSSC/Panchayats/ prominent villagers.
- (vi) Register of Water Connections:
 - (a) Register of legal water connections and new water connections released showing date-wise entries.
 - (b) List of illegal water connections along with date and date of disconnection or regularisation.
- (vii) Service Report and repair as well as spare changes reports.

44. Scope of Work of Operation:

- (i) The contractor will be responsible for giving regular uninterrupted water supply to each village two times a day as per the norms of the Department. (The timings will be fixed by First Party in consultation with GPWSSC or Gram Panchayat of the village.)
- (ii) To provide operating staff to operate the water supply system at least 8 hours per day or as per increased hours in case of peak demand of water in summer as directed by engineers of the Department.
- (iii) He should be responsible for the operations and maintenance of pumping machinery, i.e., submersible sets, electrical gazettes, electrical panel, switches and the disinfection system and various civil structures at a water works.
- (iv) To provide all the engineering spares for carrying out all the works under the scope of this contract and providing repairing spares for all electrical equipment as and when required.
- (v) To supply all the consumables required for operation of the installed equipment of water supply system. Estimated quantities of chemicals and other spares required for a month and a year will be given by the contractor. The contractor will also arrange the chemicals/material required for running disinfection system for the water supply scheme, i.e., leaching powder, sodium hypochlorite, etc., and also silver electrodes required for silver ionisation equipment.
- (vi) To check for the status of sluice valves, air valves, reflux valve, expansion joints and to see if these are in proper working order.
- (vii) To check for pipe leakages and rectify the same.
- (viii) To check for the status of manhole cover over the storage tank and chamber covers.
- (ix) To inspect for any possibilities of pollution of the distribution system and storage tanks.
- (x) To clean and disinfect all the storage tanks (OHSR/UGSR) periodically, preferably once in a quarter.
- (xi) To check for any misuse/pilferage of drinking water by any person and also bring it to the notice of GPWSSC/GP.



- (xii) The contractor will operate the chlorination/disinfection/silverionisation/dosing equipment pumps daily so as to maintain minimum residual chlorine/disinfectant at water works as directed by the Department. He will be responsible for daily chores required for proper and efficient working of chlorination unit. The minimum residual chlorine will be checked daily and recorded in the relevant register/book.

45. Scope of Work under Maintenance:

The preventive maintenance schedule is the periodical checks and precautions by which possibilities of failures and breakdowns are minimised. Daily, periodical and annual checks as prescribed by the manufacturer will be made by the contractor.

Repairs:

- (i) The contractor will promptly attend any breakdown/fault informed to him or noticed by him in the pump, repair or replace any part/parts of pumps so as to keep the pump in working condition.
- (ii) Repair of machinery, electric panel, disinfection unit and structures and repair of leakages in pipeline and specials, etc., will be got done by him within 24 hours of its breakdown.
- (iii) The contractor will be liable to use best quality of material available in the market duly conforming to Bureau of Indian Standards wherever applicable while undertaking the repair of machinery, electric panels and structure, etc.

Water Pipelines and Pipe Network Distribution System:

The contractor will promptly attend to any breakdown/repair noticed by him or informed by the Department or consumers.

- (i) Check for operation of sluice valves, gate valves, air valve, reflux valves, foot valves, etc.
- (ii) Check for any leakage, wear and tear in the water lines.
- (iii) All the material required for repair of pipe network will be arranged by the contractor.

Breakdown

- 46. Care shall be taken so that the system doesn't lead to a major breakdown. In the event of any breakdown, the same will be rectified immediately, failing which such rectification may be done at the risk and cost of the contractor. Similarly, if any breakdown takes place due to negligence of the contractor, the whole component has to be replaced/rectified to bring to the original condition immediately.
- 47. The contractor will promptly attend any breakdown/repair/complaint in the system noticed by him or informed by Department. He will make necessary arrangement for replacement/repairs of defective/worn-out parts and restore the system in healthy working condition. If any pipe/piece of pipe is not repairable, the same shall be replaced with a new pipe of same specifications.

48. The contractor will intimate any breakdown in the working of any tube well or any other installations within 2 hours to the concerned Junior Engineer. He/his workforce will make efforts to restore the running of that installation at his own level if it is possible. But if there is any major defect and cannot be rectified, its repair will be undertaken by him by installing a spare submersible set which will be kept ready by the contractor.
49. Tools and equipment required for proper operations and maintenance of the equipment and allied accessories shall be provided by the contractor without any extra costs.
50. To facilitate prompt restoration of water supply of any village, the contractor will keep the following equipment/machinery in a centralised location of that area so that the water supply can be restored in the short possible time.
 - (i) Steel tripod.
 - (ii) Electric/mechanical chain pulley.
 - (iii) Pipe wrenches, nut bolts, slings, etc.
 - (iv) Pick-up van for quick transportation of man, machinery, material and equipment.
 - (v) A range of different submersible sets of required head.
 - (vi) Lowering pipes of different sizes.
 - (vii) Submersible set cables, starters, etc.
51. In the event of any breakdown in the water supply system, the contractor will be responsible for repairing and restoring the water supply in the village/villages within 24 hours otherwise he will be penalised as per the penalty clause.

For Engineer-in-charge

52. Engineer-in-charge will ensure that the entire scheme to be given on contract should be in satisfactory working condition without any history of frequent breakdowns and crisis that require intensive technical supervision and manipulation.
53. Engineer-in-charge will ensure that the scheme has proper head works.
54. Engineer-in-charge will ensure that the Water Treatment Plants (WTPs) wherever existing should be of adequate capacity and in satisfactory working condition.
55. Engineer-in-charge will ensure that the storage tanks (OHSR/UGSR) should be of proper required capacity, non-leaking and in satisfactory condition.
56. Engineer-in-charge will ensure that the piping system including distribution should be in a healthy functional condition and there should be no leakage in the system.
57. Engineer-in-charge will ensure that the pumping machinery and its accessories should be in good health and working condition.



Transfer of Assets

58. A key plan and details of the scheme indicating the functional health of each component should be prepared. The details of each component such as the type of head works, the size and length of each pipeline, type, make and capacity of pumping machinery and its allied accessories, type, size and location of control valves, capacity and location of storage tanks (OHSR/UGSR) and number and location of stand posts and private water connections, which should be jointly signed by the contractor and Department officers and should be kept in the records.

General Conditions

59. The contractor shall not enter into partnership or sublet, transfer and assign the contract or any part thereof in any manner whatsoever. In the event of the contractor contravening this condition, Party No. 1 shall be entitled to terminate the contract, and forfeit the entire amount of security deposit.
60. Contractor shall furnish a bank guarantee of five percent of contract amount as per the rules of any nationalised bank by way of security deposit/bank guarantee failing which the acceptance of his offer shall be liable to be cancelled at the risk and cost of the contractor and the earnest money deposited by him shall be forfeited. The said security deposit/bank guarantee will not carry any interest whatsoever.
61. The Department shall have the security deposit in the form of bank guarantee furnished by the contractor. This security deposit shall be held as security for due performance of all the terms of the contract; and in case of default on the part of the contractor to perform and observe any of the terms of conditions of the said contract; and observe any of the said covenant conditions or provisions; or in the event of termination of the contract on any ground under any clause, it shall be lawful for the Department in its absolute discretion to forfeit the whole of the security deposit or any part thereof in or towards satisfaction of any claim for any damages, if any, regarding acquaintance of bank guarantee shall be referred to Superintending Engineer (as Arbitrator) and his decision shall be final.
62. In the event of security deposit being found insufficient or if the security deposit has been wholly or partly forfeited, an amount equal to the amount within 15 days from the date of forfeiture or liquidation of whole or part of bank guarantee.
63. Upon compliance by the contractor, with all the obligations and the requirements of the contract but in any case within 30 days from the last date of the contract, except for the case in which a dispute is pending with a court, the Department shall release the bank guarantee or such part thereof as has not been forfeited or appropriated as aforesaid to the contractor.
64. In any of the following events, the First Party (Engineer-in-charge) shall have the right to terminate the contract forthwith without any notice to the contractor and to forfeit the entire security deposited without prejudice to any of the rights or remedies of the Department under the contract to claim any sum or otherwise.
- (a) If the contractor being the natural person/persons die/dies; or being a natural person or a partnership firm is adjudged as insolvent; or commits any act of insolvency; or being a limited company, is ordered to be wound up; or makes an arrangement with its creditors, or fails to observe any of the provisions of contract or any of the terms and conditions governing the contract or any clause of the contract.

- (b) If the contractor commits a default and observes any of the terms of the said contract and any of the said covenants' conditions or provisions; or in the event of default on the part of the contractor to comply with any direction pursuant to this agreement signed with the Executive Engineer or any such authority; or default by the contractor in performing the contract and carry out any obligations cast upon the contractor under the agreement.

In the event of termination of contract, the entire security deposit shall stand forfeited. The Department shall in addition be also entitled to claim any loss and damage to the the water works structure and distribution pipeline.

65. In case of any dispute between the parties regarding any matter relating to this contract the matter shall be referred to the Superintending Engineer, Water Supply and Sanitation Circle, Chandigarh as Arbitrator, whose decision shall be final. Both parties agree that Superintending Engineer, Water Supply and Sanitation Circle, Chandigarh, shall be the Arbitrator and will have all powers given to an Arbitrator under the Arbitration Act as amended from time to time.
66. The legal jurisdiction for purpose of any matter in this agreement shall be Ropar District (Local Division/Sub-Division)
67. These terms and conditions shall have overriding effect over the general terms and conditions of the DNIT/Agreement.
68. The list of schemes and its technical detail has been prepared by this Department and attached with the tender form.
69. If the Department notices any misconceived alliance of the contractor with the villagers and employees of the Department and which is against the spirit of the contract agreement and the Department is earning a bad reputation for it, the contractor's security will be forfeited and will be blacklisted for future.
70. If the contractor fails to perform various duties assigned to him for the operations and maintenance of the rural water supply schemes, he is liable to be penalised for each default separately as under:
1. In case the water supply is not restored within a maximum period of 8 hours due to any fault other than power failure, the contractor shall be penalised at the rate of Rs. 500 per 8 hours till restoration of supply.
 2. If the submersible pump set is to be removed from the tube well due to any fault, its replacement by a standby pump set is to be arranged by the contractor free of cost and should not take more than 48 hours failing which a penalty @ Rs. 2,000 per day beyond the stipulated time shall be applicable.
 3. For absence of worker from duty, the following recovery shall be made:
 - (i) Rs. 200 per day per shift.
 4. For non-maintenance of water works lawns and plantations, etc., to the entire satisfaction of the Engineer-in-charge:
 - (i) Rs. 2,000 per month.
71. The contract shall be awarded for a minimum period of ONE year. However, the Department reserves the right for extending the contract for another two or three years.
72. No advance payment will be made under any circumstances. However, on successful completion of every month, payment will be released within 15 days from submission of bill.



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