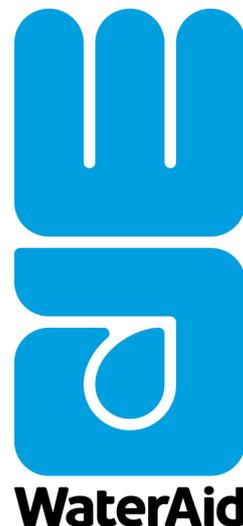




MULTI VILLAGE PIPED WATER SUPPLY SCHEME

Matto Gram Panchayat,
Bhadrak, Odisha

September 2020





Matto Gram Panchayat, Bhadrak, Odisha

The state of Odisha has been facing many challenges in ensuring safe and reliable piped water supply in rural areas for drinking, cooking, and other domestic needs on a sustainable basis. Bhadrak district is a case in point. From the drinking and domestic water access angle, of the district's 5,074 habitations, 3,862 are fully covered, 1,176 habitations are partially covered and 36 habitations have water quality issues. In Bhadrak, a total of 329 piped water supply (PWS) schemes and 16,750 hand pumps are available and functional. Chandabali block, with 36 gram panchayats (GPs) and 40,606 households (HHs), has 38 piped water supply (PWS) schemes and 2,683 functional hand pumps.

SCHEME DETAILS

PWS plant, storage tank, pumping, distribution

Matto is a Gram Panchayat in Chandabali block of district Bhadrak, Odisha. According to Census 2011, the total area of the GPs is 1123 hectares. Matto has a total population of 6195. The piped water supply (PWS) scheme in Matto covers a total of two GPs and five villages of which four villages are in Matto GP and one village in Muasuda GP.

TABLE 1: TOTAL HOUSEHOLDS (HHS) AND BENEFICIARY DETAILS

Total HHs in the 5 villages

1,444 (1212 HHs in Matto GP covering 4 villages and 232 HHs in Masuda GP covering 1 village)

Total HHs which are a part of the PWS in the 5 villages

530 (490 HHs in 4 villages of Matto GP and 40 HHs in 1 village of Masuda GP)

Total HHs not a part of the scheme in the 5 villages

914 (722 HHs in 4 villages of Matto GP and 192 HHs from 1 village of Masuda GP)

Currently, 15 of the 50 stand posts (tap posts) are functional under the scheme (this includes all villages under the scheme and not just study villages)

There are two PWS plants under Matto PWS scheme covering five villages of two GPs. The PWS plants are located at Chasakhanda and Malabad village. The scheme was sanctioned in 1996-1997 and its construction and installation began on 16 March 1996 which was later completed on 31 March 2004. It was implemented by the Rural Drinking Water Supply and Sanitation (RWSS) division, Government of Odisha and as a part of this, two borewells and two overhead tanks were constructed at two sites of the village. There are two storage tanks each with a capacity of 1,00,000 litres and their systems are powered by 12.5 HP pumps.

The plant has neither a chlorination unit nor a treatment unit but water is chlorinated once a year during monsoon. Under the Water Quality Monitoring and Surveillance (WQM&S) programme, the RWSS division monitors the quality of water and its supply while the local community is empowered to carry out water quality surveillance. Water quality at both the PWS plants is monitored by the pump driver every quarter and samples are sent to the district laboratory under RWSS for testing.

The details of the facilities and its specification are in the table below:

Table 2: PWS at Chasakhanda village of Matto GP

Facilities	Location		Parameter	Specification
	GP	Villages		
Overhead tank	Matto	Chasakhanda	Capacity (in litre)	1,00,000
Pump/Motor	Matto	Chasakhanda	Horsepower (HP)	12.5
Source	Matto	Chasakhanda	Discharge (litre per second)	17.62

Table 3: PWS at Malabad village of Matto GP

Facilities	Location		Parameter	Specification
	GP	Villages		
Overhead tank	Matto	Malabad	Capacity (in litre)	1,00,000
Pump/Motor	Matto	Malabad	Horsepower (HP)	12.5
Source	Matto	Malabad	Discharge (litre per second)	13.62

Table 4: Pipe specification of Chasakhanda village of Matto GP

Items	Material of pipe	Diameter (in mm)	Length (in m)
Distribution	PVC	160	1,391
	PVC	110	2,117
	PVC	90	3,776
	PVC	63	144
Rising Main	GI	150	45

**Table 5: Pipe specification of Malabad village of Matto GP**

Items	Material of pipe	Diameter (in mm)	Length (in m)
Distribution	PVC	160	2,000
	PVC	110	1,900
	PVC	90	560
Rising Main	GI	150	45

Table 6: Profile of beneficiary households in Matto GP

Villages	Water connection/ No pipe connection	SC HHs	OBC HHs	General HHs	Others (Muslim HHs)	Total HHs	% of WC and NWC HHs
Matto	WC ¹	43	112	49	59	263	43.11
	NWC ²	41	131	71	104	347	56.89
Sub-total		84	243	120	163	610	
Chasakhanda	WC	12	85	28	0	125	44.80
	NWC	49	61	44	0	154	55.20
Sub-total		61	146	72	0	279	
Balabhadrapur Sasan	WC	3	27	30	0	60	52.17
	NWC	4	28	23	0	55	47.83
Sub-total		7	55	53	0	115	
Malabad	WC	6	28	9	0	43	20.67
	NWC	21	122	22	0	165	79.33
Sub-total		27	150	31	0	208	
Matto GP	WC	64	252	116	59	491	40.51
	NWC	115	342	160	104	721	59.49
Total		179	594	276	163	1212	

¹ Water connection to household² No water connection to household

Reason for introduction of PWS

Matto GP is located in the coastal belt of Odisha adjoining the Bay of Bengal and is around 15 km from the sea. Prior to the PWS scheme, the community in Matto was affected by water-borne diseases due to consumption of bacteriologically contaminated and saline water. Every year, the villagers demanded an intervention and installation of a new tube well from the GP, as the groundwater level declined and salinity increased. After a long wait, PWS became operational in 2004. Since then, the community is reliant on it for both drinking and domestic purposes. Currently, the scheme is under the Panchayat Raj and Drinking Water (PR&DW) Department.

Scheme/ capital cost and contribution from different actors

The scheme has two PWS plants, located in two different villages of Matto GP - Chasakhanda and Malabad. The cost of the total scheme for Chasakhanda PWS was estimated Rs. 19,82,000 (50:50 sharing of cost by Government of India and Odisha). The GP was provided land for the construction of the PWS plant at Chasakhanda. The scheme cost for the second PWS plant at Malabad village was estimated at Rs. 15,64,582 (50:50 sharing of cost by Government of India and Government of Odisha). The total cost of the two schemes comes to Rs. 35,46,582.

Stakeholders and their roles

The major stakeholder in the PWS scheme ranged from district level department to block and village level functionaries to the beneficiaries who took a household level connection.

Table 7: Stakeholders and their roles

Stakeholders	Roles
Community/ beneficiaries	Beneficiaries have been paying for operation and maintenance (O&M).
Gram Panchayat	Matto GP provided land for the PWS scheme; post implementations, it plays an active role in the management, O&M of the PWS.
Block Panchayat	Daily operation of PWS is managed by the pump driver who was engaged by the RWSS at Chandabali Block. The Village Water and Sanitation Committee (VWSCs) formed at the village level became dysfunctional around five years back. Currently, the Block Development Office takes care of the monitoring and technical support for the PWS.
RWSS division	RD/ PR&DW department developed the detailed project report (design, estimate etc.), issued tender and conducts technical as well as water quality monitoring. The implementing agency is RWSS. GP was provided land for PWS and it undertakes the management and O&M activities. Every year, RWSS provides training to the pump driver, self-employed mechanic (SEM) on minor repairing of the pipeline and on water quality monitoring through field testing kits (FTK).
NGOs	Post-implementation, Pragati Jubak Sangh (PJS), an NGO monitored the PWS supply/ quality and trained the community on water handling practices at the household level.

Year and duration of various project phases

In 1996, the pre-planning phase of the project commenced with the involvement of RWSS and the GP. Discussions on design and roadmap of PWS and selection of habitations were held between the GP members and Block Development Office staff at Chandabali block. Subsequently, a detailed project report (DPR) was developed for the PWS scheme by the JE and RWSS in consultation with the stakeholders. The GP agreed to provide the land for development of the PWS in Chasakhanda village of the Matto GP. A similar arrangement was established in 2007-2008 at Malabad village for a second PWS plant. RWSS began community mobilisation for the PWS work at Matto GP, and the DPR was ratified by the gram sabha. The project implementation began in 1998 following the administrative approval from the chief engineer, RWSS, Bhubaneswar.

The implementation agency for the project, RWSS took the process onward by calling for tender, engaging the contractor, and pump driver for the scheme. Further, the RWSS selected the construction contractor(s), executed the PWS scheme, and ensured sample checks on the quality of construction, information, education and communication/ behaviour change communication (IEC/BCC) activities on construction quality/monitoring/use/maintenance of PWS. The community contribution was also collected during this phase, which lasted around ten months in the year 1998 at Chasakhanda and about the same time period in 2007 at Malabad.

The construction work of the Chasakhanda PWS was completed by 2004, while that in Malabad was completed in 2009. The process of the



PWS plant at Chasakhanda Village

handover of the PWS scheme to the community for management and O&M was done subsequently. To move towards project sustainability, the activities were phased out gradually and the GP took over the work from the contractor. Other activities include - continuous IEC/BCC activities, monitoring at household and community level, collection of charges, and carrying out O&M with the assistance of the Support Organisation (SO) or a Non-Government Organization, Pragati Jubak Sangh (PJS) and by the communities themselves following the exit of SOs from the scheme.

Handover of assets to the community

The PWS scheme of Chasakhanda was handed over to the Matto GP on 17 December 2005 while the PWS plant of Malabad was handed over to the GP on 22 October 2009 for management and O&M. Currently, both the schemes are being operated and maintained by the GP through technical support from RWSS, Chandabali block.

Impact of PWS on the life of women

Women had the responsibility of ensuring a ready supply of clean drinking and domestic water for the family, which forced them to walk for miles to fetch water. The PWS connection freed women and girl children from the role of water carriers and reduced their water collection drudgery. Time saved in trips for collecting water could now be used for expanding livelihood opportunities for women. Women also observed that unlike the PWS water, the water from the handpump used previously was not suitable for cooking; pulses often required greater cooking time in hard water from the handpump. On the other hand, the PWS water is suitable for cooking and drinking purposes and increased water access on premises has led to improved sanitation for most households at the household level.

Actual involvement of stakeholders in various phases

Pre-planning phase: RWSS plays a major role in developing the DPR including its design and estimate apart from playing a

role in eliciting community involvement. After the approval of the DPR by the concerned authority of RWSS and District Collector, the GP provided land for the PWS plant. RWSS and the GP played a key role in the pre-planning and planning phase of the PWS. RWSS had a key role in tendering, selecting the contractor, selecting the source site along with technical monitoring of the implementation of PWS scheme.

In the **post-implementation phase**, GP and Pragati Jubak Sangh, the local NGO, created awareness on safe water handling practices at the household level.

The pump driver was responsible for the supply of water to the households twice a day for three hours in each shift.



PWS plant at Malbad village, Matto



Apex institution to manage water supply: Structure and responsibilities

There are no apex institutions for the management of PWS and the responsibility rests completely with the GP. Monthly meetings are organised at the GP level and water supply related issues are discussed and sorted out with the support of the Sarpanch. GP members are actively involved in the water supply schemes at Chasakhanda and Malabad villages.

In village institution to manage water supply

At the time of the study, none of the villages under the PWS scheme had a functional VWSC/User Committee for management and O&M. VWSCs formed in the initial phase of implementation of the PWS scheme have been dysfunctional for the last five years. Instead of VWSC, the O&M of PWS are looked after by the GP, which has a 12-member elected committee, with women constituting one-third of the members. At the village level, the ward members are responsible for managing water supply in the villages. The GP has a bank account for handling the monthly tariff collected from the beneficiary households and the review meeting by GP takes place every month in which the functioning of the PWS is also discussed.

Other community-based institutions for water

No other community-based institutions for the water supply, management and conservation exist in the Matto GP. There are GP level SHGs that are involved in socioeconomic development, microcredit and social activities in the villages.

Quantity of piped water supply

Two PWS plants provide water at the household level twice a day, for 2 to 3 hours each, during morning and evening. On an average, households receive piped water for 4 to 6 hours a day. The PWS plant was designed to provide 40 litres per capita per day (lpcd) of water supply, but the demand for water has now increased to 55 lpcd which the scheme is not being able to provide. Moreover, the scheme also faces technical issues as the diameter of the pipeline which pumps water to the overhead tank is 4 mm but the diameter of the distribution line is 6 mm, which reduces the water pressure. Sometimes, water supply is disrupted due to failure of power and pumping issues. Particularly in the months of March, April, May, June and July, water supply is disrupted so villagers use alternative sources like tube wells in the village to access water during the supply disruption or restriction.



1 lakhs water storage overhead water tank at Chasakhanda Village, Matto, Bhadrak, Odisha

Monthly tariff/ Operational expenditure

A monthly tariff of Rs. 30 per household was collected initially, but this was raised to Rs. 50 per household per month subsequently. Uniform tariff is collected from households of different socio-economic backgrounds. The Matto GP has engaged a volunteer for the door to door collection of the monthly tariff. The volunteer receives 7 per cent of the total collected amount in return for his services. 10 to 15 percent of households' default in tariff payment. The monthly tariff was not collected between April - July 2020 due to the financial difficulties faced by people during the COVID-19 lockdown. There is a lack of clarity on whether this amount will be collected later or will be waived off altogether.

Capital maintenance expenditure

At the panchayat level, the sarpanch and the panchayat extension officer (PEO) have been keeping the maintenance fund. Only 7 per cent of the monthly tariff is spent each month, while the rest is saved in a bank account of the GP and the fund is used for maintenance and repair. Major repair is undertaken by RWSS. There are two primary sources of the maintenance fund: i) Beneficiary households by way of monthly tariff and ii) GP through central finance commission (CFC) funds. In the last one year, the PWS maintenance was conducted through the CFC funds for electricity payment etc. while the fund collected through monthly tariffs remained unutilised.



Pump house at Chasakhanda Village of Matto GP of Bhadrak, Odisha

Operation of in village PWS

The distribution of water from the overhead tank to the households and the stocking of the overhand tank is managed by the pump driver. The pump driver is adept at handling valves to direct flow in certain habitation, shut off water access in other habitation(s), prevent backflow, and adjust water pressure within the distribution system. The wastage or overuse of the water supply at public tap posts is monitored by the pump driver. The pump driver monitors the leakages, though not on a day-to-day basis. The pump driver reports to the sarpanch and the JE at the block level in case of any leakage, breakdown of structure or pilferage in the PWS. Minor repairs are done under the directions of the Sarpanch, while the major repairs are done by JE, RWSS with support of the empanelled contractor in the area.

Water supply flow is greater for houses located near the distribution tank/ source, while the houses at the tail end do not receive adequate water flow.

Repair (major and minor)

Households contact the pump driver for the minor repairs in the piped water supply. The Pump drivers also inform the Sarpanch and JE for providing technical personnel for minor repair work at the household-level. It takes 1 to 3 hours to repair the line and local plumbers are accessed from the GP or the Block level. For any major repairs, the JE of RWSS is contacted by the Sarpanch, who in turn deputs a contractor for the work, which is usually completed in a day or two.

In-village backup systems

In the two PWS plants, there are no backup systems available if faced with a power failure. The system is solely dependent on the electricity grid. Again, in case of breakdown of pump/motor or any other PWS related infrastructure breakdown, no backup system is available at hand. In such a situation, the households are reliant on alternate sources like public hand pumps.

Human resource

Two pump drivers have been engaged by the RWSS, Chandabali block for the Matto GP. One self-employed mechanic (SEM) is engaged for hand pump repairing purposes. The pump drivers and SEM get a monthly honorarium of Rs. 2,000 each from the Block Development Office. The Pump drivers work on various aspects related to the water supply to the villages such as chlorination, monitoring of pipeline, water quality monitoring and inter-village issues like damage to distribution pipes and low water flow to the households. They are responsible for the overall operation of the pump house and water supply through the distribution system. They also play a role in the coordination among the community, GP and RWSS. Every year, they undertake training from the JE, RWSS on PWS repair and maintenance, water quality monitoring and operation of pumps etc.

Source sustainability

RWSS monitors the water source levels; the level is checked once a year by a technical expert of RWSS. There are no measures in place for recharging sources, such as rainwater harvesting.

Inter-village issues

Inter village disputes about PWS arise at least 3 to 4 times a year. Issues comprise - inadequate water supply, broken stand posts, households connecting their pump set with the pipeline for filling their overhead tank in the house. These are discussed and resolved at the monthly meetings of GP.

Technological and other innovations

Both the plants have alternatives available for ensuring assured supply in case of problem with the overhead tank. The plant can deliver raw water from the source to the overhead tank or directly supply water from the borewell to the pipeline. Whenever problems arise in the overhead tank, the direct water supply system is available as a standby. Additionally, the borewell and pipeline chamber have been constructed adequately with a concrete wall.

Challenges faced by the scheme

The PWS scheme was faced with a challenging situation right from the implementation, because of the high demand from households for a new water connection. Since the scheme was planned keeping a limited population in mind, it failed to provide connection to all. Other issues include - lack of pipeline and stand post maintenance and lack of awareness among the community on PWS. There is a need for an alternative power backup system, and a request has been extended by the panchayat to form VWSCs at the village level



Suggestions for improvement

The two PWS plants have been functioning with the support of the GP, the pump driver and RWSS. The GP provides the maintenance cost of PWS. A few suggestions for improvements in the PWS include -

- Formation of an apex level institution to monitor and supervise the functioning of PWS in various GPs
- Reformation/strengthening of VWSC for management, O&M, and monitoring of PWS
- Development of the water safety and security plans along with water budgeting and its implementation in the Matto GP with technical support of RWSS and local NGOs
- Need for an alternative backup system for running PWS in the absence of power failure and the breakdown of the pump set
- Need for proper road connection to the PWS plants for transportation of machine and materials during the repair and replacement of pump set
- Renovation of underground pipeline connection to the households
- Water testing measures to be extended to the household level; corrective measures (including purification/ chlorination system) should be in place
- Repair and renovation of stand posts for covering all households under the PWS scheme
- Creating more awareness, training stakeholders on the subject of water management and minor repairs, ensuring sanitation and hygiene and household level water handling measures
- Need to take up source sustainability measures by the concerned stakeholders

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We acknowledge the inputs of Srinibas Panda, a consultant field researcher for this study, in data collection and in preparation of the draft report. Amita Bhaduri helped us in editing and finalising the reports. The study was undertaken by the Policy Unit at WaterAid India in September 2020, led by Nirma Bora and guided by VR Raman.

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