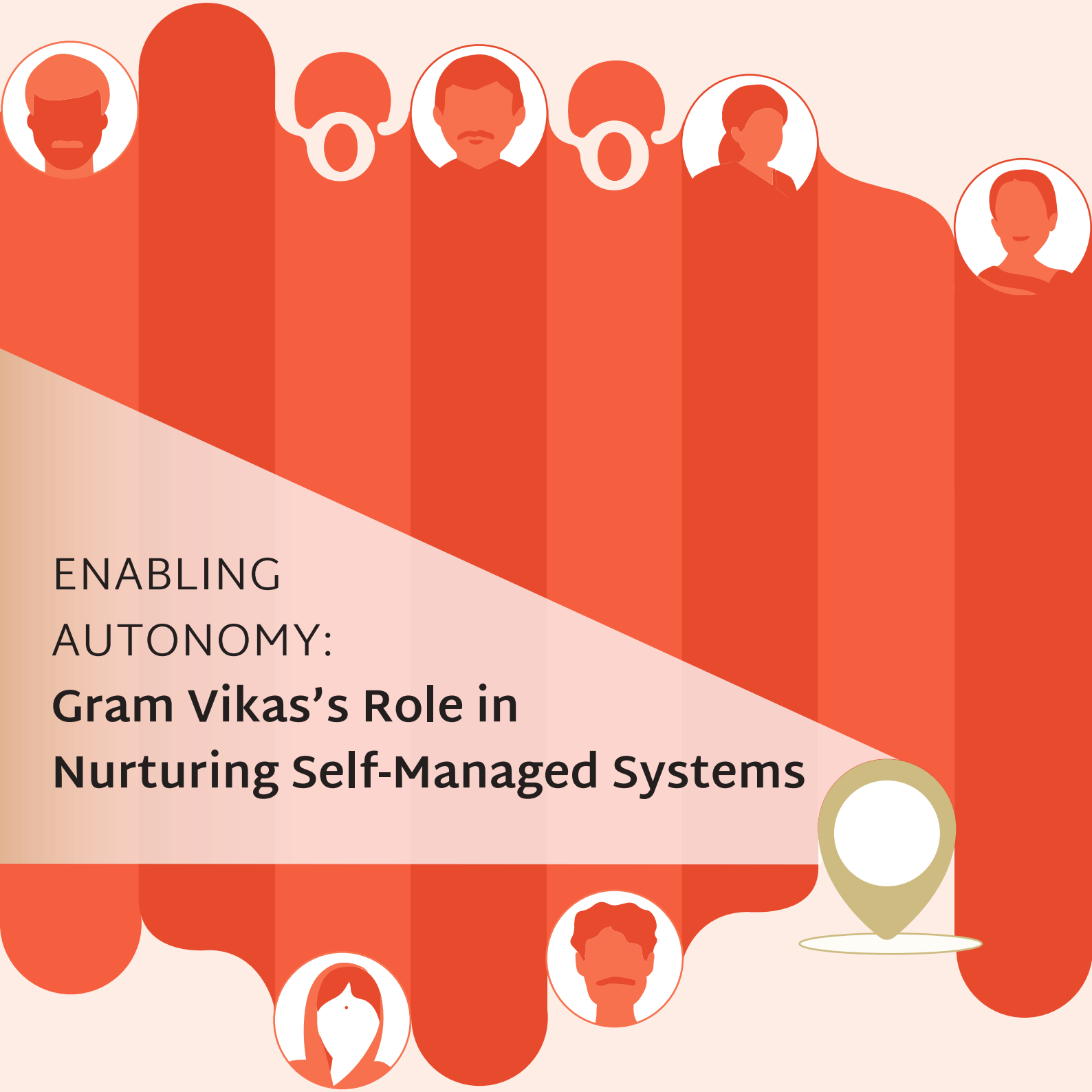
Gram Vikas



ENABLING AUTONOMY:
Gram Vikas's Role in Nurturing Self-Managed Systems

FULL REPORT

Learning from the Past

In 2022-23, Gram Vikas initiated the "Learning from the Past, Reading the Present, Planning for Future" (LPRPPF) initiative to reflect on its legacy and chart a roadmap for the future. This four-phase exercise began with workshops to frame hypotheses about how change happens, followed by in-depth reviews and community interactions. We commissioned three independent studies that evaluated the intergenerational outcomes of Gram Vikas's education programme, the resilience of self-managed water and sanitation systems, and advancements in production systems in rural Odisha. The study findings document Gram Vikas's programmes, highlighting evidence and narratives that illustrate its role in fostering long-term social change in Odisha.

Full Report
Enabling Autonomy: Gram Vikas's Role in Nurturing Self-Managed Systems

July 2024

Nous Consultants conducted the study and authored the report. Jayapadma RV and Chetan Agarwal led the study team, supported by Barsarani Sahu, Bikash Gomango, Inisa Guha, Leelu Tims Pothen, Rukmini Datta, and Neelima Khetan.

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View the summary report →

Gram Vikas commissioned this study as part of its "Learning from the Past, Reading the Present, and Planning for the Future'' (LP-RP-PF) exercise. This report, one of three in the Learning from the Past series, provides a historical perspective, contextualising Gram Vikas's journey within the broader landscape of its time.

Gram Vikas is a rural development organisation partnering with Odisha's marginalised communities since 1979, driving sustainable change and impacting the lives of over five million people in more than 8,000 villages.

www.gramvikas.org

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FOREWORD

Gram Vikas initiated the Learning from the Past, Reading the Present, and Planning for the Future (LP-RP-PF) exercise as an opportunity to reflect, convene, and design. Often, when you are in the thick of things, responding to needs as they emerge, you are implicated in the needs yourselves. Reflecting, as Gram Vikas did, over a 40+ year timeframe, allowed some distancing from its own involvement in the situation. So, the exercise purposely chose to look back in a way that allowed Gram Vikas to see its place in the context of what else was happening at that time.

This meant one had to turn an open, inquiring mind to the context. What else was happening at that time? How did the Gram Vikas approach really stack up against that? What does that say about this aspect of its legacy that it may want to hold and embed more strongly, as it goes into the next phase of its work?

Gram Vikas believed that it was **ahead of time** – in the content and process of its interventions, in the way these were conceptualised and executed, and that it stayed honest and accountable to the achievement of development outcomes for its partner communities. This assumption was examined through a detailed study of its water and sanitation programme, undertaken by a team from Nous Consultants between May to December 2023.

The insights of the team from the review of data and immersive discussions and interactions with village communities have enriched the study.

The team looked at the evolution of water and sanitation-related policies and programmes, and compared the programme outcomes with related global benchmarks.

The study concludes that Gram Vikas's intervention in water and sanitation was initiated two decades before the national government started its mission to end 'open defecation' in villages. Gram Vikas's experiences from Odisha contributed to the formulation of the Nirmal Bharat Abhiyan, precursor to the Swachh Bharat Mission.

This benchmarking shows that Gram Vikas supports village communities to build the highest service levels for drinking water, sanitation, and hygiene (JMP, UNICEF 2023). The data on results for aspects of safely managed piped water connections and sanitation and bathing facilities were all significantly higher in villages under Gram Vikas's intervention. These have led to better health and hygiene outcomes for households and had positive implications for improved menstrual health of women and girls.

Community-based water and sanitation systems, as supported by Gram Vikas, seem to provide an opportunity for all people, irrespective of their caste, class, and educational levels, to take part in decision-making related to the programme's functioning. This is particularly significant when compared with evidence on the differential patterns of access to public water bodies on account of ideas of purity and pollution, among others.

There is a second important aspect to looking back. What does this tell us about the legacy of the work? What must Gram Vikas carry forward?

In an early workshop with associates and older staff, some of the metaphors associated with the Gram Vikas legacy were a 'self-generating forest' and an 'asha badi' (a stick that supports self-reliance). Gram Vikas believed that it partners with communities to establish self-managed systems.

One can draw on many frameworks in development literature to sketch this out. The LP-RP-PF exercise wanted to privilege learning from experience. Village Development Committees (VDCs) that have survived, even thrived, over the last 20-plus years have earned their stripes as self-managed systems. What can we learn about self-managed systems when we unpack their experiences? This constituted the second part of this study.

The Nous team listened to 11 VDCs across the state, which represented diverse contexts. The team visited them during the peak summer of 2023. The study report, including detailed cases of the 11 villages, gives valuable insights for the future work of Gram Vikas, particularly in promoting water secure gram panchayats.

It seems that the primary purpose of VDCs is to ensure the continued availability of safe piped drinking water for the entire community. Sanitation is not expressly mentioned by the VDCs as a concern, but its continued use shows that it is probably an important, unacknowledged aspect of this core purpose – this is reflected through their articulation of dignity and pride. In sustaining these systems, the VDCs are moved by a social responsibility towards the next generation, to ensure that they have the same level of, or even better, facilities.

The self-managed systems indicate that the intervention builds on existing social capital – the leadership of individuals who mobilised their communities and liaised with Gram Vikas, such as Laba Biswal (Dengapadar), Subhan Mandal (Anusahi), and Rabi Babu (Angarpada). Villages like Dengapadar and Angarpada had mandalis or existing community initiatives which helped galvanise this effort.

One has to note the significance of inspiration. Many of these systems have either been inspired by others (Tarava by the adjoining village Buruding; and Gramdebati by Nuasahi and Terigocha), or have inspired others in turn, like Dengapadar. Nine of 11 habitations in Dumerjore and all 11 wards in Angarpada panchayat have community-based water and sanitation systems.

The study noted the many instances of water connections being extended to new households in all the villages and that the original soak pits were still in use. The approaches to achieve this are diverse. There are VDCs that have kept operational costs very low and simple, yet effective norms for operations; there are also VDCs that have relatively high operational costs and that have developed more evolved systems for their functioning. In both scenarios, they have evolved systems for the collection of charges and the supply of water and are largely able to pay their electricity bills (Angarpada, Kanamana), or have found a way to control them (Dengapadar).

The VDCs tend to tackle problems as they arise, deploying diverse responses. In some instances they are proactive or have planned ahead, as seen in Dengapadar (1997), where the VDC invested in a generator, standby motors, and even a spare water tank. In Tarava, the entire village goes for one 'assignment' of labour, the earnings from which are used for their immediate needs.

In six of these villages, new water sources have been added over time by the VDCs to cater to the additional water needs of the village. Self-managed systems seem to liaise with external agencies through diverse mechanisms to address their need to augment the water supply or address shocks such as breakdowns.

The experience of self-managed systems shows the kinds of roles VDCs are expected to take up. Besides keeping the system running and liaising with external agencies, it appears that VDCs are expected to propose solutions and generate consensus within the community on challenges being faced. The approaches they take seem to challenge our traditional notions, or perhaps our expectations as external development actors, on how things 'ought to be'.

Older members continue to take the lead in many villages, though younger men and women are also taking greater interest. Trust in the leadership seems to be vested in a few, with changes in VDCs being slow or externally facilitated. Water stress is not faced evenly across all hamlets. Rules are developed, but not always enforced. Facing the increasing 'privatising' of water supply by members building pumps and storage at the household level, the VDC of Angarpada has developed a fine to dissuade this practice; even if it is not enforced, it signals an alertness. It shows the complex web of relationships that bind these committees with the communities and their own desires for keeping the system going, with equitable access for all.

In this context, which of Gram Vikas's stances have helped?

The work done by Gram Vikas introduced some foundational processes, such as bookkeeping, transparency through general body meetings, and most importantly, a value framework of inclusion and equity. This can be seen in the space for women in the committees, a focus on the inclusion of all, self-managed systems, and, particularly, the leadership women tend to take for early redressal when piped water supply is disrupted.

Gram Vikas also built capacity through training local plumbers and masons who could attend to needs locally. In many villages, the same person has continued at the post for several years. Gram Vikas stepped in to support inclusion and helped build a new system or augment capacity where supply was weak or uneven in some parts of the habitation. Most importantly, it has been a friend over the years.

The complexity of this work is captured well by the team when they quote an elderly woman from Gramdebati, Ganjam, saying, "Each day we (women) had to go to fetch water from the dug well for household activities, and water was sufficient then. Now there is a whole system in place, but water is still not sufficient." There are stories such as Dumerjore in Sundargarh, where the self managed system functioned well and with enthusiasm, but is currently going through some difficulty.

In this, it seems self-managed systems can emerge and sustain, rooted in their desire to provide water and an improved quality of life for future generations. They are fuelled by a developing sense of pride within their villages ("our water is sweet"), in their management ("a lot of money has been spent in our village in the name of different schemes and programmes, but none of them have lasted the way the water supply and sanitation programme has; even now we get water on tap all through the day in our homes"), and in intergenerational improvement.

The asha badi – the stick that helps this system move along – seems to be the acts of leadership in these systems, like Enosh Mandal, who is the go-to person for repairs and new installations but does not charge. Gram Vikas seems to have had a role in setting them up for their work and then being an all-weather friend, a stance it can continue to hold.

ACKNOWLEDGEMENTS

Gram Vikas has worked in partnership with the rural communities of Odisha for close to 45 years. Their intervention in community-based integrated water supply, sanitation, and hygiene (WASH) spans almost three decades. At its core, this study is about listening to communities that have been part of this intervention, understanding their perspectives, and making sense of self-managed systems. Listening is not a one-off endeavour, since there needs to be trust, also patience, for people to be really able to share their experiences, about what worked, and more significantly what did not work, and how challenges were overcome. In the course of the study, we made an effort to build trust and listen, with patience and empathy and without judgement. Another part of the study relates to data aspects, on how WASH outcomes in the villages of Odisha, where Gram Vikas has worked, compares with global, national, and state-level data. This presents revealing insights into community-based self-managed systems.

This study was challenging and interesting, and being part of it has been a learning experience for us. In all the villages we visited, people were willing to engage with us, and spent several hours sharing their experiences and showing us around the village. We were visiting them in June, before the monsoons set in, the most vulnerable month in terms of the availability of water. Our sincere gratitude to the men and women in Angarpada, Anusahi, Bandipahad Sadakpada, Beheraguda, Dengapadar, Dumerjore, Gramdebati, Kanamana, Kudupakia, Tala Landusahi, and Tarava.

Our gratitude also to the field teams of Gram Vikas who supported us in course of the visits, organising the meetings and facilitating our stay – Damayanti Das, Basanti Devi, and Sabitri Ojha in Mayurbhanj, Kiran Kujur in Sundergarh, Biswajit Sahu and Sibaram Sahu in Jharsuguda, Jobin Thomas and Santosh Kumar Padhy in Kandhamal, Manas Samanta, Ramesh Chandra Naik, and Sarat Mohanty in Ganjam, Laxmi Narayan Panda and Abnaijar Raika in Gajapati, and Nirmal Mohanty for traveling with us in the early part of the study. At the head office, Gangadhar Panigrahi and Chandramohan Patnaik gave us useful background and helped us prepare for the study. Sangeeta Patra and Apurva Ghughey helped coordinate and plan for the study and gave us access to documents, and Lipika Verma provided data support in a timely and efficient manner – for all their support we are thankful. Varun Namineni helped us understand the data management system and Benstin Jenith gave us useful inputs about Gram Vikas's work in water resource technologies. We are thankful to Vartika Jaini and Liby Johnson for their inputs, feedback and guidance throughout the study.

Nous Consultants

EXECUTIVE SUMMARY

A study of the outcomes of Gram Vikas's efforts in nurturing self-managed systems is relevant for Gram Vikas for the insights and learnings it provides on the work that has been done in community-owned and managed water supply and sanitation for over three decades, and for guiding their emerging work in building water secure gram panchayats.

Gram Vikas initiated work on community-managed water supply and sanitation in 1991, combining social mobilisation and techno-managerial approaches derived from its work in biogas promotion as well as community development with tribal communities of Odisha.

In any village where community-owned and managed water supply and sanitation has been undertaken by Gram Vikas, they have intensively engaged, on average, for 1-3 years. Subsequently, the village community, through the VDC, takes on the responsibility for operations, maintenance, and augmentation.

These self-managed systems are in evidence across the
1,431 villages with 99,776 households
where Gram Vikas has practised its interventions (Gram Vikas, 2023).

What does it take to build self-managed systems and what is the Gram Vikas experience?

This report aims to understand and analyse self-managed systems, which are steered and navigated by people who are also served by the system, based on team visits to 11 villages. These villages have the experience of running self-managed village development committees (VDCs) for 8–25 years. They operate in different socio-economic contexts – some are homogeneous with regard to caste groups, while others have people from different castes and religions. There are also different geographic and hydrologic conditions with diverse natural endowments.

The determinants of success include the ability to meet water supply expenses (including electricity for pumping water and motor maintenance) and operator expenses (relating to day-to-day operations and responding to minor wear and tear and repairs). Villages that are successful have written rules, and have the ability to revise these when necessary, including monthly fees, collections for lumpy repairs, timings of water supply, etc. They make efforts to make improvements in the infrastructure to ensure the supply of water to all throughout the year. Most importantly, there is the presence of active leadership and collective action.

What emerges from the study are some of the following common features of self-managed systems.

COMPELLING CORE PURPOSE FOR COLLECTIVE ACTION

'Water-on-tap' was clearly the biggest draw in bringing people together. People shared anecdotes of how there were disease outbreaks from waterborne illnesses, especially at the onset of the monsoons, before the piped water supply and toilets became operational. Piped water would begin only after all families of the habitation had built toilets and bathing rooms, forcing communities to come together and work for the 'individual and collective good'.

The process of involving all families in the village and building a corpus fund, with contributions of ₹1000 per family, as an indication of their commitment, helped build trust, evolve norms, and develop a common understanding among villagers about the process of working together. Different mechanisms have been adopted to raise the corpus fund, invest and use it, and bring new families into the fold as populations have grown. The corpus funds managed by the VDCs have more than doubled in many villages and is a source of financial security for the VDC.

Village communities develop rules that they follow, and with active leaders steering collective action, the primary purpose of supplying piped drinking water to all households is ensured.

CO-CREATING CONTEXTUAL RESPONSES, PROBLEM-SOLVING, AND SERVICE ORIENTATION

The solutions for sourcing water and piped supply to the households are arrived at after technical hydrogeological assessments by experts and inputs from the local community on their understanding of the water resources in the area.

It becomes clear from the studies of these villages that a one-time technical solution is unlikely to work. The solutions are responsive to locally available resources and are contextually designed. Generating financial and non-financial contributions from the local community, as well as financial support from the government, is critical.

The 'solution approach' is iterative, based on an understanding of the local ecosystem and responsive to variability in supply (water sources may fail or dry up over time) and increased demand (caused by population growth and increased need for domestic use). Most villages started with piped water supply throughout the day, but have resorted to fixed timings for the release of water each day. This has been necessitated by seasonal fluctuations at the water source and also the increased cost of electricity.

The VDCs have been able to extend the piped water supply to meet growing demand from population increases in the villages, demonstrating their service orientation. Their ability to respond to shocks, such as high electricity bills and motor breakdowns, is demonstrative of their agility and resilience. In each such instance, it is their task to propose solutions and generate consensus within the community. Women push for early redressal, since they are most affected when the piped water supply is disrupted. In Bandipahad Sadakpada, women took the initiative to settle the arrears in the electricity bills so that the water supply could be resumed.

Frequent motor breakdowns have resulted in several villages having backup motors to ensure the continuity of water supply, many of them procured with support from the Panchayat. The VDC of Dengapadar purchased a generator to pump water when there is no electricity. Other villages, like Angarpada, Kanamana, and Tarava have installed solar pumps to lift water, thereby reducing electricity costs.

NURTURING ENTREPRENEURIAL LEADERSHIP AND DOWNWARD ACCOUNTABILITY

The VDCs demonstrate distributed leadership and downward accountability in addressing issues or concerns of specific groups of people in the village, ensuring the various voices are heard, and the response time taken to address such issues is improved.

In Dengapadar (1997), one of the oldest villages, the committee now has only male members; all the other VDCs currently have 30–50 per cent women. Women dominate in the VDCs in Gramdebati Talasahi (2022) and Bandipahad Sadakpada (2015). All the VDCs in the 11 villages have been reconstituted at least once, and 9 out of 11 are now registered as Societies.

During the construction process, designated people were trained in keeping records of all kinds – stock registers, cash books, labour rolls, etc. Selected educated youth were also trained to keep records of village meetings, receipts, and expenditures.

Community participation, governance with documented policies and procedures, and accountability are demonstrated in various ways in these villages. There is transparency in decision-making and record-keeping, consensus-building for making decisions, reporting back on financial aspects, including the collection and use of funds, and addressing issues related to equitable water supply faced by the different groups in the village. The VDCs engage with the panchayats to get funds to augment the water sources and water storage facilities.

The self-managed systems we visited demonstrate a 'mastery of human artisanship': where the community is willing to maintain a certain level of collective action, and a core of local entrepreneurs exists to provide leadership and respond to shocks and changes, it is possible to build on the momentum introduced by the intervention.

LOCALLY EMBEDDED TECHNICAL SKILLS AND CAPACITIES

In every village, at least one person has been trained in plumbing, to deal with ongoing maintenance and minor repairs of the water supply systems. This person(s) had worked alongside the plumber(s) from Gram Vikas during the process of laying pipelines, fitting taps, fixing valves, etc., and learnt how to operate and maintain the motor.

In almost all the villages, masonry training was conducted during the construction process, with up to 8-10 people being trained in some of the villages. Across the villages we visited, the biggest benefit of training local

persons in plumbing and masonry was that most repairs could be serviced within the village itself, people were accessible when needed, and at reasonable costs.

All the villages reported regulating the timings of the water motor, and the release of water from the overhead water tank at specific times. There are habitation-level monitoring mechanisms to oversee storage, wastage, and excess drawing of water. Metering is being considered in some villages to monitor water use.

The VDCs keep a tab on cleaning of water tanks; in most villages this is done through voluntary labour, in some it is through paid contractors. In recent years, water samples have been sent to labs for testing. In some villages, local youth are trained to test for water quality, which is a paid service they provide to the village.

Village 'lekha mitras' have been recently introduced – they are locally trained persons who periodically update and audit the books of records and finances of VDCs.

In addition to the regular household-level collections, many VDCs have introduced innovative community-level resource mobilization efforts from ponds, labour contributions, etc., to meet the costs of regular operations and periodic maintenance of the water supply system, as well as emergency expenses.

CREATING SPACES FOR WOMEN AND FOSTERING DIGNITY AND PRIDE

There is a sense of pride and confidence in communities where there are self-managed systems, especially among women. Water-on-tap and the use of toilets are emblems of modernity, with facilities equalling or bettering those in towns. Women expressly shared how their time has been freed up with the assurance of water on tap, and the dignity and safety of using toilets. Their continued and growing engagement ensures improvements at the individual and collective levels in health, education, and income levels. The interest of new brides to seek alliances where there are similar facilities came up in many conversations. Above all, women, through self-help groups and village committees, play significant roles in the village community.

How do WASH-related outcomes of Gram Vikas's interventions in Odisha compare with global benchmarks?

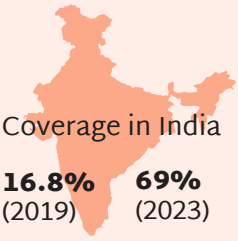
Over the years, the work done by Gram Vikas across villages in Odisha has been evaluated and documented by international research agencies and organisations. There is also data from extensive Status Assessment Surveys (SAS) conducted by Gram Vikas across villages where it has worked. In 2018, 846 villages were surveyed, and in 2020, 626 villages. In the survey, 31,255 households existed from Gram Vikas's first interventions, while 10,331 households (25 per cent) came into being after the interventions.

In terms of the parameters defined by the World Health Organization and United Nations Children's Fund's Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), Gram Vikas supports village communities in building the highest service levels for drinking water, sanitation, and hygiene.

The sustainability of the outcomes was assessed by correlating the quantitative data from villages in Odisha where Gram Vikas has its interventions, with global and national data on water, sanitation, and hygiene.

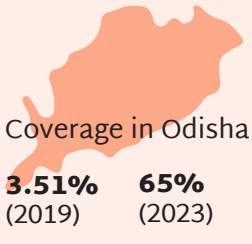
Among the households studied by Gram Vikas in its SAS, 75 per cent continue to have safely managed piped water connections. This is significantly higher than the national average of 31.7 per cent households with piped water connection in 2020 and 42 per cent households at the global level (JMP, 2020).

Jal Jeevan Mission data on rural populations receiving safe and adequate drinking water within their premises through piped water supply indicates an increase in coverage of households from 2019 to 2023.



Coverage in India

16.8% (2019) **69%** (2023)



Coverage in Odisha

3.51% (2019) **65%** (2023)

43% of the world's rural population had access to safely managed sanitation services (JMP, 2020)

50% rural population had safely managed sanitation facilities in India (JMP, 2020)

79% households, the population with improved sanitation facilities was higher in villages covered in Gram Vikas's intervention, compared to the global and national coverage (Gram Vikas SAS, 2020)

58.7% population having bathing facilities at home across India (JMP, 2023)

75% households having access to separate bathing room with piped water in Gram Vikas's area of intervention (GV SAS, 2020)

Separate bathing rooms contribute to better hygiene outcomes and have positive implications for improved menstrual health of women and girls.

Qualitative outcomes through WASH interventions in communities include disease and morbidity reduction, drudgery reduction, and community inclusion. Evidence from external studies conducted in villages where Gram Vikas has worked in Odisha has been juxtaposed against comparable global evidence from studies on similar parameters.

DISEASE AND MORBIDITY REDUCTION

As compared to water from an unimproved source, the availability of better quality water on premises resulted in the reduction of diarrhoea by 52 per cent. Moreover, when water is treated at the point-of-use through filtration, solar treatment, or chlorination, it leads to a 50 per cent reduction in diarrhoea vis-à-vis when untreated water from an unimproved source is consumed (WHO, UNICEF & World Bank, 2022).

- An interrupted time-series analysis (Duflo, 2015) of nearly 100 villages where Gram Vikas has intervened shows that, as a result of the integrated water and sanitation intervention, there was a reduction of 30-50 per cent in episodes of severe diarrhoea. Formal tests for the persistence of results showed that the impact persists for more than five years.

It is essential to have access to sufficient safe water for managing morbidity associated with neglected tropical diseases like trachoma, schistosomiasis, and soil-transmitted infections. Safe water is required to reduce or stop the transmission of infection and prevent it from rebounding (WHO, UNICEF & World Bank, 2022).

- A matched cohort study (Reese, 2019) randomly selected 45 intervention villages from the group where the intervention had been completed five years ago and matched them to 45 control villages. Access to a household-improved toilet was almost five times higher in the intervention villages than in the control villages (85.0% vs. 17.7%). It was found that the prevalence of soil-transmitted helminth (STH) infection among children in the intervention villages was half as high as in the control villages. Intervention villages also saw a smaller proportion of stunted and underweight children under the age of five, compared to the control villages, and found evidence of the protective effect of the intervention on infection with any STH in children.

DRUDGERY REDUCTION

When drinking water has to be collected from a distant source, women and girls bear a disproportionate burden of this arduous task. This adversely affects their health and safety. When girls are involved, it adversely impacts their school attendance and completion.

A national survey in India in 2018 found that water was being collected from off-premises sources by 40 per cent of rural households and 20 per cent of urban households. Households in rural areas reported making two to four trips for fetching water every day. Among the 64 million households where water was fetched by women

from off-premises sources, almost 50 million person-hours were spent by women to fetch water each day, and almost 90 per cent of this burden was borne by rural women (WHO, UNICEF & World Bank, 2022).

- In the matched cohort study (Reese, 2019), it was found that the 45 villages that had Gram Vikas interventions showed a positive association with minor improvements in round-trip time to the water source, even though it was with a higher prevalence of water intermittency, in all likelihood, due to greater dependence on the piped system in the intervention villages.
- Another study stated that, as a result of Gram Vikas's efforts, the availability of piped water within household premises eliminates the drudgery of women, who no longer have to spend 4–5 hours a day fetching water and can use the time to engage in economic activities (Pless, 2012).

Overall analysis and conclusions

An analysis of these investigations bears out the following evidence:

- Rural communities have the willingness and capacity to sustain self-managed systems over long periods of time. The VDCs work with the core mandate of ensuring piped water supply to households in the community. This in itself presents a variety of challenges to which the VDC must respond in a timely and agile manner, with a service orientation to ensure that there is equity in the supply of water.
- The premise of 100 per cent inclusion is sustained to a large extent in terms of access to piped water supply and sanitation, even with the growth of population in the habitations. There is a growing demand for water, not just due to increases in population, but also due to changing behaviour, aspirations, and needs for water. This has to be matched with the reality of fluctuations in water supply due to seasonal and broader climatic factors, as well as to overall demands on water resources. The VDCs have been innovative in rule-making to match the demand with supply and made efforts to augment sources of supply as well. Where the piped water system fails, it fails for everyone.
- The VDCs are largely democratic and have leaders with conviction and management skills to manage complex processes. They make and enforce rules, have the capacity to adapt and respond to shocks, and make course corrections. Over the years, there have been transitions and a widening of the leadership base. Women have come to occupy a seat at the table, and play an active role in managing the system, and ensuring that water supply continues without disruption. The presence of local technical capacities to manage the infrastructure and troubleshoot when there are problems is a crucial factor in ensuring uninterrupted and well-functioning systems.
- The VDCs put in place and enforce mechanisms to raise financial resources through community contributions and leveraging from panchayats where possible. These resources are deployed to meet ongoing and emerging expenses.
- Self-managed systems are internal-facing, accountable toward the community, and have a service orientation. They are also external-facing, have capacities to network with relevant government departments, participate in and raise resources from the panchayat, and seek technical support where needed to ensure continuity of their systems.

The outcomes of these are seen in the continued access, the use and upkeep of the physical infrastructure, and the improved outcomes in villages in health, drudgery reduction, and community inclusion in other development activities. Women take an active interest in and participate in community processes. People take pride in their villages, and believe that their village rivals, and at times is even superior to, what is available in urban areas.

The qualitative and quantitative data in this regard show Gram Vikas's interventions in villages in Odisha have resulted in equivalent and, in many instances, better outcomes compared to global, national, and state-level benchmarks. More importantly, these outcomes are sustained for many years.

01
Purpose of the Study

This study is part of an organisation-learning exercise initiated by Gram Vikas in July 2022.

LEARNING FROM THE PAST, READING THE PRESENT, AND PREPARING FOR THE FUTURE

A study of the outcomes of Gram Vikas's efforts in nurturing self-managed systems is important and relevant for Decade V of Gram Vikas, for the insights and learning it will provide on the work that has been done in community-owned and managed water supply and sanitation. It will also serve as guidance for their emerging work in Water-Secure Gram Panchayats.

As the Terms of Reference for this study states:

Community-owned and managed water and sanitation has been the key intervention of Gram Vikas for over 25 years. We have been a pioneer in this space and the impact on communities has been documented extensively. We would like to showcase the achievement in this dimension, i.e., not just the delivery of development indicators, but the building of self-managed systems which can offer 'deerghasthayi vikas'.

Gram Vikas is working on its Decade V on Water-Secure Gram Panchayats – which is another self-managed system. Establishing the work and owning insights of the past, is a way to also establish our credentials for continued work, though with a wider scope or mandate.

The study was undertaken by a team from Nous Consultants over April to October 2023. Field visits were conducted in May and June 2023.

02
Approach and Methodology

This report is an attempt to understand the sustainability of outcomes through, on the one hand, correlating data from village communities with global data; and on the other hand, engaging in a process of listening, seeing, and sense-making of self-managed systems in select villages, which are steered and navigated by people who are also served by the system.

The section of the study titled 'Quantitative Assessment of the Status of Self-managed systems' was carried out through a study of documents including global and national reports and data related to water, sanitation, and hygiene available in the public domain. This includes data collected by UNICEF and WHO through the Joint Monitoring Programme (JMP), NITI Aayog's SDG India Index and Dashboard, the National Annual Rural Sanitation Survey (NARSS) conducted by the Ministry of Jal Shakti, Government of India, and the National Family Health Survey-5 (NFHS-5).

Over the years, the work done by Gram Vikas across villages in Odisha has been evaluated and documented by international research agencies and organisations. Gram Vikas also conducted extensive Status Assessment Surveys in 2018 and 2020 across villages where it has worked. These documents were researched as part of the study. A detailed list of references is presented at the end of this report.

The part of the study titled '**Expression of Self-managed Systems – Listening and Sense Making**' involved selection of villages and visits to them, and discussions with key protagonists associated with the self-managed systems. Through a process of stratified sampling, we selected 11 villages where Gram Vikas has intervened, and which have demonstrated self-managed systems.

The process of selection took into account the following:

- Review of Gram Vikas's Status Assessment Survey and identification of villages where water supply systems have continued to function, and which have had a continued use of sanitation infrastructure.
- Villages from different time periods, signifying different durations of functional infrastructure, and working as a self-managed system
- Villages from different geographies to look at the functioning of institutions and systems in different geo-physical conditions, with different sources of water, etc.
- We also factored in diversity in size and socio-economic composition of villages.
- We made a note of overlaps with Gram Vikas's current work in Water Secure Gram Panchayats.

We made an effort to chronicle the journey before, during, and after the interventions related to the water supply and sanitation systems in each village. The dialogue covered conversations on the importance of the water supply and sanitation systems in people's lives, the observed and perceived outcomes of the interventions, how they sustain it, the evolution of norms and the status of infrastructure, the mechanics and roles of the Village Development Committees (VDCs) as a representation of the self-managed system, the experience of managing common resources, etc. Case studies for each village have been documented by the study team. Visits to the villages were planned with Gram Vikas field teams. In each village we were able to spend one to two days.

The engagement during the visits to the villages included:

- Conversations with old and current members of the VDCs
- Discussions with women and youth in the villages
- Verification of available records and documents of the VDC
- Visual assessment of the condition and use of the water supply systems and sanitation infrastructure in the villages and status of cleanliness
- Transect walks across the villages to understand the state of water and natural resources, livelihoods, local institutions, and overall socio-economic conditions.

The study team referred to two frameworks in the process – the community capitals framework (CCF) (Mattos, 2015) and the institutional analysis and development framework (IAD) (Lam, 2010). These were used as guides and not as focal lenses for our study. Key elements of these two frameworks are described below.

The Community Capitals Framework (CCF)

- Communities represent complex, dynamic systems; combining 'community' with 'development' adds to this complexity. A healthy and vibrant ecosystem which is responsive to the social and economic well-being of its people, is built through a dynamic interaction of its various capitals (resources or assets). These include the natural capital, physical capital, social capital, financial capital, human capital, civic (and cultural) capital, and political capital.
- CCF is a conceptual inter-disciplinary framework for exploring the assets and resources in communities that can be leveraged for change. CCF helps approach community change from a systems perspective through the identification of assets in each capital (stocks of capital), how capital is invested within a community (flow of capital), and ways in which the capitals interact.

The Institutional Analysis and Development (IAD) Framework

- IAD is designed to facilitate analysis of institutions and processes through which individual and collective choices occur.
- It involves assessing the attributes of the physical conditions and the community; the rules in use that are made and followed; the actors involved and the interactions between them over time in certain action situations; and the patterns of interactions and outcomes that are generated.

2.1. Structure of the report

The structure of this report is as follows.

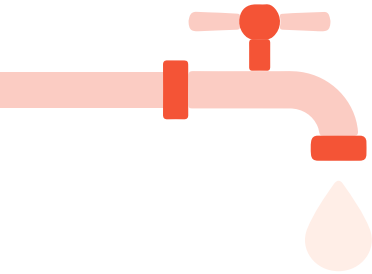
SECTION 3	Provides an overview of Gram Vikas intervention in community-based integrated water supply and sanitation. This sets a context for the self-managed systems that are described and discussed in the report.
SECTION 4	Focuses on the self-managed systems in 11 villages which were part of the field study. It draws from their experiences to help us understand what makes self-managed systems tick.
SECTION 5	Presents quantitative benchmarks of the outcomes of self-managed systems in the villages of Odisha where Gram Vikas has worked, vis-à-vis state, national and global data. It also relates external impact assessments and studies in Gram Vikas intervention villages with qualitative global data on outcomes of WASH systems.
SECTION 6	Draws some conclusions from the study and looks at some issues that confront self-managed systems that may be relevant for Gram Vikas in its work with communities going forward.

03

Gram Vikas's Intervention in Community-managed Water Supply and Sanitation

Gram Vikas initiated the community-managed integrated water supply and sanitation programme in the early 1990s. This was based on the experience of working across the state of Odisha on the biogas programme, and working with tribal communities in the districts of Ganjam, Gajapati, and Kalahandi. At that time, the high levels of morbidity and mortality in villages, affecting their health and productive capacities, was a key concern. A study on health status of the communities, conducted by Gram Vikas in 1990 across several districts of Odisha, revealed that over 80 per cent of the morbidities could be traced back to water-borne diseases. This was caused by improper disposal of human faeces, leading to contamination of water and poor conditions of sanitation and hygiene in villages. Seasonal fluctuations in water availability exacerbated the burden on women and girls in fetching water for domestic use. The lack of privacy while defecating and bathing affected their gynaecological health, dignity, and safety.

A pilot programme for community-managed water supply and sanitation was initiated in 1991. The approach and design combined social mobilisation and techno-managerial approaches that Gram Vikas had been working with for nearly two decades. After a gradual inception and learning phase, the programme rapidly grew.



Gram Vikas's outreach has so far extended across 25 districts of Odisha and 2 districts in Jharkhand, where 99,776 households have three taps each, with water supply, in 1,431 villages (Gram Vikas 2023).

Gram Vikas's integrated water and sanitation programme is built on five principles, which are at the core for negotiation with participating village communities. Its partnership with village communities is contingent on their agreement with these principles. Briefly, these are:

- 'All or none'—100 per cent inclusion: This is not only necessary for effectiveness in public hygiene; it also ensures that poor people and those socially excluded are not left out, ensures equity, and gives the entire village a shared purpose to work together.
- 'Share costs': Everyone needs to make a significant contribution to the initial capital cost and bear the costs of running and maintaining the facility. This ensures people have a stake in the facility and continue to look after it.
- People 'take responsibility' from an early stage to generate consensus, mobilise local contributions, manage construction, take charge of operations and maintenance, and ensure long-term sustainability.
- The programme actively promotes the 'participation of all', ensuring that women and poor people are included in its management. This is essential to ensure that development processes continue for the benefit of all.
- The creation of a 'corpus fund and maintenance fund' ensures there is 'inbuilt financial sustainability,' that there are sufficient resources for major repairs and upgrading infrastructure facilities, so that future generations continue to be served.

These principles were formalised towards the end of the pilot programme in five villages between 1991 and 1995. Subsequently, in all the villages that Gram Vikas intervened in, these principles have been contextually applied. They help lay the ground for communities to experience the process of negotiating with each other, resolving differences and conflicts, and most importantly including everyone in the habitation, taking into account the situation and needs of the poorest persons in the village.

Based on this approach, in each of the participating villages the following institutional and infrastructure systems were established:

- Twin-pit pour flush toilets and bathing rooms for every family
- A piped water-supply system connected to local water sources (a bore-well, sanitary well or spring); water is pumped using electric or solar power or gravity flow into an overhead water reservoir or sump, and distributed through pipes connected to two or three taps per family
- A village development committee (VDC) or village water and sanitation committee handling the ownership and management of the water and sanitation system
- A village corpus fund, set up with an initial per family contribution of ₹1,000, maintained in a bank fixed deposit, whose interest income was to be used by the VDC for financial assistance to new families in the village, to build toilets and access water supply to ensure full coverage at all times
- A maintenance fund managed by the VDC to pay for the regular upkeep and repairs of the piped water-supply system

In addition to leveraging community resources and contributions for the development of infrastructure, Gram Vikas supports VDCs in accessing government funds for piped water and sanitation, as well as grant funds from corporate social responsibility and philanthropy.

Gram Vikas's active engagement with each village is through a combination of 'hardware' support and 'software' interventions, till the time the sanitation and water supply infrastructure becomes fully functional, and is available, accessed and used by all families. The time taken for this process varies across villages. During this time the capabilities of the VDC is developed in each village, enabling Gram Vikas to withdraw from the village, with the VDC functioning as a self-managed system.

04
What Does It Take to Build Self-Managed Systems?

The table below is a snapshot of the villages included in the study, their location, habitation size, and caste composition. They also indicate the vintage of the self-managed systems.

Table 1: Profile of villages included in the study

	District	Blocks	Gram panchayat	Village habitation (self-managed VDC since)	ST	SC	OBC	GEN	Total
1	Ganjam	Kabisuryanagar	Nandiagada	Dengapadar (1997)	0	43	269	7	319
2	Mayurbhanj	Raruan	Angarpada	Angarpada (1998) +	29	29	166	9	233
3	Gajapati	Nuagada	Khajuripada	Anusahi (2001) +	79	1	0	0	80
4	Gajapati	Gumma	Tarava	Tarava (2001) +	66	0	0	0	66
5	Gajapati	Rayagada	Laxmipur	T. Landusahi (2006) +	50	0	0	0	50
6	Ganjam	Jaganath Prasad	Khetamundali	Gramdebati (2009/ 2022) +	54	0	0	0	54
7	Ganjam	Chatrapur	Kanamana	Kanamana (2010)	39	53	57	16	165
8	Jharsuguda	Lakhanpur	Lakhanpur	Beheraguda (2010) +	12	1	20	6	39
9	Sundergarh	Kuarmunda	Dumerjore	Dumerjore (2013) +	135	7	18	0	160
10	Kandhamal	K. Nuagaon	Sirtiguda	Kudupakia (2015) +	18	84	1	3	106
11	Jharsuguda	Lakhanpur	Lakhanpur	Bandipahad Sadakpada (2015) +	87	0	16	1	104

+ sign indicates villages where Gram Vikas has worked with all or almost all the villages in the panchayat and has reconnected through the Water Secure Gram Panchayat (WSGP) programme.

In the population composition,
- Green is the dominant caste.
- Yellow is the next largest caste.
- Red is the smallest caste group.

These villages have the experience of running self-managed VDCs for eight to 25 years. They operate in different socio-economic contexts – some are homogeneous with regard to caste groups, while others have people from different castes and religions. There are also different geographic and hydrologic conditions with diverse natural endowments.

These villages were selected through a stratified random selection process from among the 626 villages which were part of the Status Assessment Survey in 2020, which met the condition of having a functioning water supply and sanitation system at the time of the survey.

- At the time of the village visits in June 2023, the water supply system in Beheraguda (2010) and Kudupakia (2015) were disrupted due to non-payment of electricity bills. We tried to understand the VDC's effort to resolve this issue.
- We visited the villages at the peak of summer, and at that time only Gramdebati Talasahi (2022) had 24-hour water-on-tap throughout the year. Anusahi (2001) and Tala Landusahi (2006) which have spring supply, and Dengapadar (1997) which has a dug-well have water supply through the day for nine months of the year, with reduced supply in the summer months. In the remaining villages, for all 12 months, households have rules whereby they receive water on tap for a few hours in the morning and evening.

4.1. Experiences of self-managed systems

The study focused on trying to understand the experiences of self-managed systems over the years, with the VDC as the anchor. Self-managed systems are dynamic entities and their responses are shaped by their central purpose, and affected by changes in the context in which they operate.

Some of the questions which we were interested in getting answers to included:

- How have the VDCs fared after Gram Vikas withdrew from active engagement in the villages? What capacities do they have to continue their roles?
- What are the aspects in which VDCs have grown and extended beyond the mandate for which they came together?
- What benefits do they derive from functioning as self-managed systems?
- What challenges do they face and what are their capacities to deal with these situations?
- What factors contribute to sustaining these self-managed systems?

The starting point of our conversations in all the villages was to understand the reasons why people in the village came together, and how the Village Development Committee or VDC came to be set up.

'Water-on-tap' was clearly the biggest draw in bringing people together. People shared anecdotes of how there were disease outbreaks from water-borne illnesses, especially at the onset of the monsoons, before the piped water supply and toilets became operational. That piped water would come only after all families of the habitation had built toilets and bathing rooms, forcing communities to come together and work for the 'individual and collective good'.

The emphasis on 'all' was clearly one that villages needed to work on, and this condition played out differently across villages. In villages which were the 'first movers', it took anywhere between one to three years to build consensus. Gram Vikas staff invested time in the initial period of mobilisation in each village towards formation of a representative VDC, and making sure that members of the VDC understood their roles and responsibilities. Gender and caste differences made this a difficult process, from women not willing to sit with men in non-tribal villages because

of social customs and norms, to people from lower castes not being allowed to sit 'on the same mat' with upper caste persons.

- In all the villages, the inhabitants said that the 'initial conditions' put forth by Gram Vikas were crucial factors which made them come together, across barriers, and help them to continue to work together even today. These initial conditions relate to the five principles on which Gram Vikas bases its intervention: All or none – 100% inclusion, Share Costs, Take Responsibility, Participation of All, and In-built Financial Sustainability.
- In Angarpada (1998) and Dengapadar (1997), which have had self-managed systems for close to 25 years, people shared, "we did not believe that we would actually get 'water on tap' inside our homes." Once an example was set, the work spread to neighbouring villages, and the acceptance there was faster. All eleven wards in the Angarpada Panchayat today have the same facilities. After seeing the water supply and sanitation system in Dengapadar, a large village adjacent to it, Nandiagada, also joined the programme.

The sustained operation of the community-managed piped water supply system, and ensuring that all families have access to it and participate in its upkeep, is discernible as "the primary purpose of the VDCs without which they lose their meaning".

The introduction of piped water supply and sanitation have community-level benefits related to: reduced drudgery for women, improvement in health outcomes due to the reduced burden of disease, improved health outcomes for young children through fewer cases of water-borne diseases, improved cleanliness, and quality of life and well-being for the village community. Villagers experience a sense of dignity and pride in being part of these villages.

The VDC therefore straddles the discrete and interlinked tasks of ensuring that:

- The piped water system continues to function uninterruptedly; freshwater, from common-pool resources, are uncontested and available for everyone's use and protection.
- Water is supplied through a piped water system to individual households for a certain fee, and is a club good. Individual households make initial contributions and continued payments for sustaining the infrastructure.
- Individuals in the village build and use toilets, and maintain the pipes and taps in their homes, which are private goods.
- The continued behaviour of individuals using toilets and being mindful about waste disposal ensures an excreta-free environment, contributing to a public good.

Typology of VDCs

While straddling this complex frame as described above, a broad range of community-based self-managed systems are seen in the villages. The typology of VDCs, differentiated in relation to water supply expenses and operator costs, is as follows.

Table 2: Typology of VDCs

Water Supply Expenses (electricity for pumping water, motor maintenance)	Operator Costs: Low	Operator Costs: Medium	Operator Costs: High
Low	T Landusahi (spring source)		
	Anusahi (spring source + solar-powered dug-well)	Dumerjore (panchayat pays electricity bill and operator expenses)	
	Tarava (bore-wells with grid + solar)		
	Gramdebati Talasahi (solar-powered bore-well)		
Medium	Gramdebati Mundiasahi (bore-wells with grid + solar)		Dengapadar increased monthly collections for electricity (standby generator)
	Bandipahad (Sadakpada) - pending electricity bills		
High	Beheraguda (bore-well with grid) pending electricity bills	Kudupakia (bore-well with grid, dug-well with solar) pending electricity bills	Angarpada and Kanamana (bore-wells with grid + solar) increased monthly collections for electricity

The villages in dark green are those where the VDCs have coped with challenges and successfully managed to keep the water supply system functional, for long periods.
In the villages in light green, the VDCs and the water supply system function moderately well.
The two villages in purple are the ones where the VDCs have managed for some years but are currently struggling to keep the water supply system functional, in both cases due to pending electricity bills.

On the one end we have VDCs that have very low operational costs and simple yet effective norms for operations. Tala Landusahi (2006), Anusahi (2001), and Tarava (2001) fall in this category. These are relatively small-to-medium-sized villages, largely tribal, that are blessed with gravity-fed springs or low electricity bills, with a combination of electricity from the grid and solar power to pump the motor. They have been able to operate their systems with voluntary operators or in-grain payment. On the other end are villages which have to deal with relatively high operational costs, related to

some extent to the large size of the village, necessitating the need for more water to be pumped, stored, and supplied. They have developed fairly evolved systems for operations, maintenance, repairs, financing, and decision-making. Villages like Dengapadar (1997), Angarpada (1998), and Kanamana (2010) fall in this category. Over time they have evolved systems for the collection of charges and supply of water, and are largely able to pay their electricity bills (Angarpada, Kanamana) or have found a way to control them (Dengapadar). They have augmented their water supply systems over time, with additional bore-wells, tanks, solar power, etc. They have also successfully increased the charges they collect from households over time to cover the increases in expenses. For new households, they have provided water supply, and generally insist on the construction of toilets and bathrooms, and a contribution to corpus funds as well.

In the middle are a range of villages – some who are running their systems successfully, others have faced challenges and shocks (high pending electric bills or repeated motor failures) and dealt with them with varying degrees of success.

Relating to the IAD framework, factors that may explain differences in performance and better performance in self-managed systems include

- efforts to make improvements in the infrastructure;
- the existence of written rules and the ability to revise these when necessary, including monthly fees, collections for lumpy repairs, timings of water supply, etc.;
- mechanisms to monitor violations including fines and sanctions; and
- the presence of active leadership and collective action.

4.2. What makes self-managed systems tick?

Different villages have taken different paths to self-organisation and setting up self-managed systems. These are linked to the context in which they operate, their history, and socio-political backgrounds. Some VDCs have been able to build upon the momentum set by the intervention and thrive, while others have been struggling to varying degrees. Some common features of self-managed systems are as follows:

4.2.1. Compelling core purpose for collective action

The primary purpose of VDCs is to ensure continued availability of safe piped drinking water for the entire community. In sustaining the systems they are also moved by a social responsibility towards the next generation, and ensuring they have the same level of, or improved facilities.

The principle of 'all or none' continues to be followed to a great extent insofar as water supply is concerned. VDCs make an effort to ensure that all families have the same level of services. In practice this is affected by factors including the seasonal availability of water, private investments, government support for the extension and repair of facilities, etc.

- "...initially everyone got the same facilities, we became equal," noted Raja Rao from Kanamana in Ganjam. A village with 144 families in 2007 when the programme was implemented, there were families from STs, SCs and other backward castes, as well as a few families from the general category. Expectedly, there were differences in incomes and occupations. Construction started in 2007. It took three years for everyone in the village to complete construction of their toilets and bathing rooms. Work on the water supply system began only after this and water supply finally started in 2010. In 2023, there are 165 families in the habitation, and all of them continue to have toilets and bathing rooms. A water connection is given to new families only after they build their toilets and contribute ₹1,000 to the corpus fund, as everyone else had done earlier.

All the villages reported that, at the start of the programme, the corpus fund was built through average contributions of ₹1,000 per household. While indicating the households' interest in being part of the programme, the corpus fund was intended to be a resource to enable the VDC to extend support to 'new families' in the village to build their own toilets and bathing rooms. All the villages have maintained this corpus fund, typically in a fixed deposit, and have added to it through contributions by new households. The plan for the use of the corpus fund and the process for the renewal of the fixed deposit were not clear. With Gram Vikas as a signatory to the account, VDCs felt that the fund could not be misused. Having a corpus fund is a source of strength for VDCs and they consider it an asset which needs to be sustained.

- "This is for all of us, no one is left out," emphasised the villagers of Dengapadar (1997) describing their shared purpose. They recount how Gram Vikas staff would visit the village every day, and have meetings to make sure that all the 238 households were convinced about being part of the intervention. It took almost two years to bring everyone together. Special attention was paid at the time to the poorest families, landless, and women-headed households, on how they would be equal participants in this programme. The income from pisciculture, which went each year into a community fund to organise the annual jatra (community festival), was used to make a contribution of ₹500 per household towards the corpus fund, which reduced the burden of contribution on individual families. Dengapadar, which now has 380 households, started with

₹2,38,000 and now has ₹20 lakh in its corpus fund. The village, in fact, ran into income tax problems because of the size of the fund. Hence, instead of keeping it in one fixed deposit, the VDC has made 10 individual fixed deposits of ₹2 lakh, giving the responsibility to 10 individuals, who have given an undertaking that the money will be held on behalf of the VDC and will not be used for any personal purpose.

- In Angarpada (1998), the panchayat made a contribution of ₹500 per household towards the corpus fund, and a few families were provided with land to construct toilets and bathrooms. Later, when other villages in the panchayat decided to participate in the programme, they too received ₹500 each, to offset their contributions to the corpus fund. Angarpada which now has 265 households started with ₹1,73,000 in its corpus, and it now has a corpus of ₹14,00,000.

The process of involving all families and building a corpus fund with contributions from them as an indication of their commitment, helps build trust, evolve norms, and develops a common understanding among villagers about the process of working together. Village communities develop rules which they follow, and with active leaders steering collective action, the primary purpose of supplying piped drinking water to all households is ensured.

4.2.2. Co-creating contextual responses, problem solving and service orientation

The VDCs said that the local communities provided inputs into the design, planning, and implementation of the infrastructure, as well as for the design of the operations and maintenance mechanisms. This they said is essential to create robust local institutions around the natural resource and physical infrastructure, and build a sense of ownership. The solutions for sourcing water and piped supply to the households are arrived at after technical hydro-geological assessments by experts and inputs from the local community on their understanding of the water resources in the area. The solutions are responsive to locally available resources, and are contextually designed. Generating financial and non-financial contributions from the local community as well as financial support from the government is critical. The VDC facilitates these processes and conducts extensive discussions with all the villagers to generate consensus around proposed solutions.

The nature of the cost-sharing by the local community, government and Gram Vikas, at the time of building the infrastructure depends on the source of water – bore-well, dug-well, or spring, as well as soil and terrain conditions, which determine the location and height of the water tank, length of the pipeline system carrying water from the tank to all households, etc. Springs were typically located far up in the hills and needed longer pipelines.

The local contribution typically includes locally available materials like stone, sand, mud and unskilled labour, for building the individual TBRs and the common infrastructure for water supply. Some VDCs told us that the villagers collectively made bricks and some made rings for soak pits.

The external contribution typically includes bought materials like cement, steel, and pipes, as well as the technical and skilled inputs of engineers, masons, plumbers, etc., which were arranged for and provided by Gram Vikas.

Sources of Water – the Supply Side

The natural environment affects the availability and quality of water, the 'supply side'. The socio-economic conditions of the communities, and their growth trajectories and aspirations have implications on the 'demand side', factoring domestic uses as well as production needs. Identifying and sustaining the sources of water is a key concern for self-managed systems. The sources of water across the villages we visited are varied, and described here.

Spring sources: Tala Landusahi (2006) and Anusahi (2001) have successfully managed their water supply with spring sources. Their VDCs have regulated the quantum of water released by adding gate valves, and water is available throughout the year. In two villages, Gramdebati (2009) and Tarava (2001), the springs that were originally harnessed to bring water to the village, failed. In Tarava the spring was abandoned also due to insect infestation and the reduction in supply.

- Gramdebati initially catered to three hamlets, Talasahi, Mundiasahi and Dhobasahi, but elephants rampaging through the forests broke the water pipes from the spring source. A bore-well was dug at Mundiasahi and connected to grid power, but the water was inadequate so the residents of Talasahi did not receive much water and did not contribute to paying for electricity. The VDC members of Mundiasahi cut off water supply to Talasahi and Dhobasahi. The Talasahi hamlet petitioned Gram Vikas and now have their own water tank and bore-well with a solar pump, built with support from Gram Vikas, the RWSS, and local contributions in 2022.

Dug-wells and Bore-wells: Bore-wells are a more common source of water, as seen in 8 of the 11 villages; in 6 of these, new sources have been added over time by the VDC to cater to additional water needs of the village. Dug-wells are the main source in Dengapadar, which sits on a sheet of rock. Kudupakia (2015) and Anusahi (2001) are two other villages where the backup water source is a dug-well with a solar pump.

Responding to increased demand for water

A common sentiment across villages is that "the population has increased, households have increased, needs have increased, therefore water demand has increased". There is therefore a constant need to upgrade the water supply. The sources of water – spring, bore-well, dug-well – play a critical role in meeting the increasing demand for water.

In most villages the water tanks were built keeping in mind population growth over the next 20 years and factoring 55 litres of water per capita per day. The augmentation of water sources, and storage tanks in some instances, has been done with the support of Gram Vikas, and where possible funds have been leveraged from the government by the VDC under different schemes. The VDCs play a central role in making these plans, and ensuring community contribution of up to 20 percent of the costs, in the form of labour and local materials.

- In Dengapadar (1997), initially a 78,000-litre water tank was built with water being pumped from two dug-wells, and two additional water tanks of 35,000 litres and 50,000 litres were built later. The third tank of 50,000 litres is used only during festivals, marriages, or in case of an emergency. The VDC on its own initiative invested in a generator and built a separate pipeline through the village which is connected to 20 stand posts accessible by all the households. At times when the piped water supply is disrupted, the generator is run to lift water to the water tank and released through the stand posts, but this is not supplied to individual houses, given the cost of operating the generator.
- In Angarpada (1998), a water tank of 70,000 litres and a bore-well were built initially, and 2 bore-wells and 3 water tanks were added later – 14,000 litres in 2001, 12,000 litres in 2006, and 12,000 litres in 2008. The VDC leveraged funds from the government for these, and asked Gram Vikas to provide technical assistance for the design and construction of the tanks. The government also provided a solar pump which is connected to one of the bore-wells.
- Dumerjore (2013) initially built a 65,000-litre water tank. Of the four bore-wells dug with government support, two yield water. Subsequently an additional water tank of 20,000 litres and a bore-well were built to supply water to part of the habitation which was not getting enough water. Even today a few families in Puran Tola are not getting piped water due to pressure differences.

It becomes clear in the study of these villages that a one-time technical solution is unlikely to work. The 'solution approach' needs to be iterative, based on an understanding of the local ecosystem, and must be responsive to variability in supply as well as demand. This needs technical expertise, which is aligned with and draws upon local resources and knowledge.

New water connections

There are instances of water connections being extended to new households in all the villages we visited. In some villages, the extension of piped water supply is contingent on the construction of a toilet and bathing room by the new household. In the smaller villages, water supply has been extended on the understanding that toilets will be made as and when the households are able to afford to, or can access some government subsidy for toilets.

- In six villages (Dengapadar, Angarpada, Tarava, T. Landusahi, Kanamana, and Dumerjore, Beheraguda), piped water supply connections are given after households build their toilets and bathing rooms. In addition the VDCs seek a contribution of ₹1,000 per household to the corpus fund. However, no support is provided to these new families from the corpus fund to support construction of toilets and bathing rooms.
- In Tala Landusahi (2006), the VDC provides a connection if the new family contributes Rs10,000. The explanation given was that any new family could become a shareholder in the village funds (corpus and maintenance), but since they have not participated through labour and material contributions, this amount is justified.
- The sarpanch of Anusahi (2001) who is also the VDC president plans to extend the water pipeline to a hamlet not covered initially, and has arranged the necessary panchayat funds this year. He says the households will also build toilets, as and when they get support from the government.

New toilet construction and repair of old toilets

The toilets and bathing rooms built initially were identical for all households, irrespective of economic status. Over time, several families across villages, if they have the financial resources, have improved their initial toilets, built larger ones, and added tiles, showers, and other amenities. Most 'new families' which have joined after the initial intervention, have built toilets at their own cost and as per their own design. As one villager said, "if they can afford to, they build good toilets".

After 2014, funds from the Swachh Bharat Mission (SBM) have been accessed for the construction of new toilets, facilitated by the VDC.

- In Angarpada (1998), the women's SHG undertook construction of 100 toilets under the SBM. In Dengapadar (1997) and Dumerjore (2013), some families received support under the SBM to construct new toilets, though they were not able to recall the exact number. All the families in Kudupakia (2015) were initially supported through SBM and ITDA funds, but since then new families in the village have not received support and have not built toilets.

In many of the older villages the structures, roofs, and doors of toilets and bathing rooms need repairs, and the toilets are visibly not being used. Repairs are dependent on the household resources. Families found themselves not eligible for SBM support, since technically they had a toilet, even if it was in an unusable condition. The VDC has not taken any steps to ensure or enforce repair of these toilets by the households.

- Anusahi (2001) was an exception, where the government gave funds for the repair of toilets and for building new toilets after Cyclone Titli caused widespread damage in 2019.

The VDCs, however, are vigilant about broken pipes and taps, since these lead to water wastage. In all villages, there are plumbers and masons who can do the repairs. Plumbing and repairs are usually done by the operator who runs the motor for pumping water.

- The VDC in Dengapadar (1997) shared that they conduct hamlet-wise inspections to ensure there is no wastage of water. The VDC in Angarpada (1998) gets taps repaired if the family delays or has genuine difficulties in doing so.

In most villages the original soak pits are still in use, and there were no reported instances of broken soak pits. Once one pit is filled, the lever is switched to use the second soak pit. Meanwhile, once the waste in the first pit dries up and settles, it is emptied.

- In Angarpada (1998), one woman reported that her family had built only one soak pit: when it filled, they had to wait for three months for it to dry, then empty it, and put it to use again. She insists that two pits ought to be built by each household to ensure there is no disruption in the use of toilets.

Responding to shocks

While in most villages the VDC fell into routine processes of work, they were sometimes jolted by sudden shocks to the system, such as high electricity bills, or technical issues such as the breakdown of the motor. The VDCs tend to respond to problems as they arise. In some instances they are proactive or plan ahead, as seen in Dengapadar (1997) where the VDC invested in a generator, standby motors and even a spare water tank. In some cases, villages experience an unravelling of collective action, as evident in those with large pending electric bills. Re-starting supply by getting their connection restored is not an easy option, as it requires considerable follow-up and negotiation.

- During our visit we found that the water supply had stopped for over four months in Beheraguda (2010) and for over a year in Kudupakia (2015) over non-payment of electricity bills for the motor. Villagers claim that the bills were not received regularly, and the accumulated payments showed up as very large arrears.
- In both villages, VDCs have made repeated petitions to the Electricity Department to reduce charges and restore the connection, but have not been successful. The villagers in Beheraguda suggested that there should be a petition at 'higher levels' for lowering electricity charges for decentralised drinking water supply.
- Women in the VDC in Bandipahad Sadakpada (2015) which also experienced a brief period of disruption due to the non-payment of electricity bills came forward to resolve the issue. They negotiated with the Electricity Department to make part payment of the arrears. They have undertaken to pay their monthly bills on time, and in addition, will clear a part of the arrears.

Another recurrent problem in sustaining the water supply relates to the motor, when it develops snags and stops working. In many cases this was not anticipated and came as a shock when it first happened. Each time a motor needs repair or replacement, water supply is disrupted from up to a week to almost a month. This causes great inconvenience, especially to the women who must again fetch water from the public water sources like the hand pumps, or dug-wells. The problem is addressed in different ways across the villages, some have factored this in by planning ahead.

- In Beheraguda (2010) and Bandipahad Sadakpada (2015), both in Lakhanpur Panchayat, the motor broke down more than once, either because of their poor quality or, as the VDCs, claim the sediment in the water chokes the motor (the villages are close to the Mahanadi coalfields). In Bandipahad Sadakpada, the motor has had to be repaired or replaced at least five times in the past, most recently in December 2022. The five women in the VDC decided to pool ₹4,000 each to buy a new motor for ₹20,000, as an interim measure, so that their water supply was not disrupted for too long. This amount was subsequently recouped through contributions of ₹200 per household. However, this motor also broke down within a few months, and the households did not have water for almost three months. They then applied to the panchayat and received a new motor in May 2023, trading one of their older non-functional motors in exchange. To install the new motor, the entire village came together and provided labour. The motor they had earlier purchased has been repaired and kept as a standby.

- In Dumerjore (2013), the motor stopped functioning twice. The first time the villagers withdrew money from their maintenance fund; the second time, however, since two signatories of the bank account were not present - one from Gram Vikas and another from the village - they had to collect money from the households to repair the motor. The women in Dumerjore said that due to the pressure they exerted on the VDC, the issue of the motor was finally resolved.
- In Dengapadar (1997), the VDC has arranged for six motors on standby, so that at no time would there be a disruption in the water supply; they also have a generator. Angarpada (1998) also has standby replacement motors.

The VDCs have been able to extend the piped water supply to meet growing demand from population increases in the villages, thus demonstrating their service orientation. Their ability to respond to shocks, such as high electricity bills and motor breakdowns, is demonstrative of their agility and resilience. In each such instance, it is their task to propose solutions and generate consensus within the community. Women push for early redressal, since they are most affected when piped water supply is disrupted.

4.2.3. Nurturing entrepreneurial leadership and downward accountability

To ensure the availability of piped water to all households and respond to their needs, VDCs make rules for water supply, maintenance of the infrastructure, and payment of bills. They demonstrate distributed leadership and downward accountability in how issues or concerns of specific groups of people in the village are addressed, whether their voice is heard, and the response time to address such issues. With practice, the processes of democratic decision making and accountability have become embedded in the VDCs.

To bring women into community-level decision-making processes, separate women's groups were formed in all the villages. Over time women have gained the confidence to sit together with men, participate in the meetings, and take leadership roles at the community level.

Membership and representation

While selecting members for the VDC, Gram Vikas initially put forth the condition that there had to be equal representation of women and men. In most villages, in the initial instance, around 30 per cent of the members were women.

- In Dengapadar (1997), one of the oldest villages, the committee is all male now. All the other VDCs currently have 30-50 per cent women. Women dominate in the VDCs in Gramdebati Talasahi (2022) and Bandipahad Sadakpada (2015).
- In Angarpada (1998) and Dumerjore (2013) women of the SHGs actively discuss issues related to water supply and sanitation, and facilitate decisions made by the VDC.
- The VDCs in large villages like Dengapadar (1997), Angarpada (1998), and Kanamana (2010), have set up hamlet-wise sub-committees to make sure everyone has a say and all voices are heard. Where sub-communities have been organised, they are able to collaborate with the VDC and the VDC listens to their views.
- Where VDCs have continued to function well, strong leadership and a continued experience of collective work are an advantage. People spoke about strong leaders at the start of the programme who were able to bring the community together. The names of such leaders, like Laba Biswal in Dengapadar (1997) who died some years ago, Ravana in Kanamana (2010), and others, still come up in conversations.
- All VDCs in the 11 villages have been reconstituted at least once. The most recent changes have been between 2018 and 2023. Older members continue to take the lead in many villages, though younger men and women are also taking greater interest. There is a sense of 'trust' and 'respect' for the older leaders.
- All villages have a VDC, and 9 out of 11 are registered as Societies. The average size of a VDC at the time of formation is 11 – and lowest being 8 (Anusahi) and the highest 15 (Kudupakia). We could not discern the caste composition of the current VDCs.

Capacity building of VDCs

The capabilities of leaders of VDCs are built to steer the consultative processes, to take decisions, generate consensus, take action, and be accountable. The investment and support by Gram Vikas in the initial years in each village built strong project management and financial management capabilities in the VDCs. These are essential to make VDCs are agile, adaptive, and responsive, and can work to ensure that the water availability sustains over long periods and benefits all, and can keep costs low and the systems light.

At the time of construction of the water supply and sanitation systems, designated persons in the VDC were trained in keeping records of all kinds – stock registers, cash books, labour rolls, etc. They had the responsibility of maintaining the store and issuing materials.

- Registers for recording meetings, fund collections, stock registers, passbooks, fixed deposit slips, etc., are being maintained in all villages, although the process and rigour of keeping records of meetings varies. In Dumerjore, termites had eaten the resolutions register!

A high level of coordination during the construction process was crucial, since external materials and support was brought in at specific stages of the construction, and all families had to be at the same level at that time to be able to make use of these. For example, after the foundation of the toilets and bathrooms had been marked, the digging and stone-laying work had to be completed in tandem, so the team of masons could complete the work in a time-bound manner. Detailed time schedule plans were made by the VDC and agreed upon by all villagers at meetings.

- In Dumerjore (2013), during the process of construction, a team of volunteers from the VDC went around the village, lending a hand where needed, so that the toilets and bathing rooms were built in a time-bound manner.
- Sub-committees were appointed by the VDC in most villages to ensure construction plans were followed by all families. Hamlet-wise sub-committees can have a closer engagement with households and address their specific needs.

The stipulation that piped water would be released from the overhead tank only after all the families had completed construction of the toilets and bathing rooms, helped to put pressure on families to work on time, and ensured there was coordination and follow-up.

Embedding democratic decision-making

VDC members learnt how to prepare an agenda for meetings and how to keep records of discussions at the meetings; many also began the practice of reporting back to the village on key decisions, especially related to financial aspects on income and spending over the year. VDCs started with holding daily meetings at the time of construction, formation of sub-committees, and physical visits to households. Once the water supply system was functional, the frequency of meetings transitioned to a monthly or need basis.

- In Tarava (2001) VDC members said, "We had meetings every day in the initial months. When the construction started, we had to take responsibility and play different roles."
- Most VDCs now meet every month, especially at the time of collection of monthly charges, although not all meetings are recorded. They also meet any time they need to, especially when electricity bills have to be paid, or when the water supply is disrupted.
- In Dengapadar (1997), Angarpada (1998), and Kanamana (2010), the practice of reporting on funds utilisation annually in a general body meeting is an important part of the work of their VDCs. This was instituted by Gram Vikas over a few years (one to three) in the initial period to build the discipline and capacity within the villages to steer the VDC.
- Last year an audit of accounts by the Village Lekha Mitra was done in T. Landusahi (2006), Beheraguda (2010), and Bandipahad Sadakpada (2015), with support from Gram Vikas. The VDC paid Lekha Mitra for the audit service.
- A scan of recent resolutions by some villages reflects discussions on water security, cleanliness of toilets and bathing rooms, solid waste management, child faeces management, and menstrual hygiene. In some villages Village Poverty Reduction Planning has been carried out to provide inputs to Gram Panchayat Development Planning.

Community participation, governance with documented policies and procedures, and accountability is demonstrated in various ways in the villages. There is transparency in decision-making and record-keeping, consensus-building for making decisions, reporting back on financial aspects including the collection and use of funds, and addressing issues related to equitable water supply faced by the different groups in the village.

Connecting with the panchayat and other local institutions

The VDCs have been an incubator for local leadership to develop and engage with the panchayat. Members of the VDC are representatives of the panchayat in almost all the villages, from the current to the former sarpanch, ward members, etc. The practice of Palli Sabha and Gram Sabha, however, appears to be limited.

- Villages like Angarpada (1998) and Anusahi (2001) were the first to take up water supply and sanitation work in the panchayat. Seeing their example, other villages in the panchayat were motivated to begin similar work. In 8 out of the 10 panchayats we visited, there is 100 per cent coverage in water supply and sanitation systems. In two panchayats, Kanamana and Nandiagada, there is 50 per cent coverage.

The amount leveraged from the government for the water supply and sanitation infrastructure was dependent on the government schemes and programmes available at the time. The VDC played an important role in approaching and follow-up with government officials to secure these funds.

- In Angarpada (1998), the Member of Parliament Smt Kumudini Patnaik gave ₹100,000 from the Local Area Development funds in 2001, to build an additional water tank. In Lakhanpur Panchayat, Jharsuguda the MLA provided financial support to build toilets and bathing rooms to all families in the panchayat.
- From the mid-2000s, funds from the Total Sanitation Campaign and Swajaldhara were leveraged, and SBM funds were accessed from 2014 onwards. In Kudupakia, where work was done in 2015, ₹12,000 per household was raised from the Swachh Bharat Abhiyan, and an additional ₹13,000 per household from the ITDA.

The VDCs in the various villages have undertaken water tank repairs to address leaks, cracks, peeling paint and plaster, etc., and also for general maintenance.

- Support from the panchayat for water tank repairs was accessed by the VDC in Dengapadar (1997), Anusahi (2001) and Tarava (2001). In Kanamana (2010) they spent money from the community fund, and were able to get a reimbursement from the panchayat.
- In Angarpada (1998), the VDC made several requests to the panchayat, but when they did not receive funds, they used their maintenance fund to undertake repairs in 2023. Collections were made from the households, after discussions in village meetings. Currently, the repairs inside the water tank have been completed, while repairs on the outside have yet to be done. The VDC had this on the agenda to discuss with the community.

VDCs have played a crucial role in getting additional support for water supply from the government, through the panchayat (from MGNREGA or other funds) or the RWSS.

- All the villages have alternative water sources which are available to the community, including hand pumps, dug-wells, ponds, streams, etc. VDCs facilitate raising funds for the maintenance and development of these, but do not have a direct role in their management.

- The quantity and quality of water in these sources fluctuate seasonally. Dependence on these sources increases in summer, when the piped water supply is rationed, and also when there is a breakdown in the piped water supply system.
- Angarpada (1998) and Kudupakia (2015) have recently installed solar-powered pumps with small storage tanks with support from the government. These can also be operated as hand-pumps.

In all villages water for drinking and toilet use is supplied free of charge to the anganwadi and school. The anganwadi worker, ASHA worker, school, SHGs and Van Suraksha Samiti, as well as traditional village committees all work closely with the VDCs. In most villages there is an overlap of membership of the VDC for water and sanitation and the traditional VDC.

VDCs' engagement with JJM – Vasudha – Mega Projects

Pipes for water supply projects given by the Vasudha Programme of the JJM are visible in many villages, though they are not yet operational. The VDCs provide inputs to these projects on the layout of the pipes. There was a general feeling among the VDCs and villagers that they should keep the community piped water system operational and not depend completely on the new mega project.

- A perception voiced in several villages was that the 'mega project' is a dream that is being shown to the village – a dream of piped water supply which they have already realised on their own steam through their 100 per cent coverage of both pipe water supply and toilet and bathrooms construction and use.

The self-managed systems indicate that as long as the community is willing to maintain a certain level of collective action, and a core of local entrepreneurs exists to provide leadership and respond to shocks and changes, it is possible to build on the momentum introduced by the intervention. Maintaining this working order requires a 'mastery of human artisanship' (Lam 2010), which varies across communities, and which may be limited to a core purpose or extend beyond to other aspects of self-governance.

4.2.4. Locally embedded technical skills and capacities

What Gram Vikas did with credibility was to demystify technical skills during the construction phase, and embed them within the local community, adhering to high standards of design and quality. This built high levels of self-reliance in subsequent years, and ensured that problems were addressed in a timely manner. Trained technicians, such as plumbers and masons, available within the community, are valued resources which contribute to self-reliance of the VDCs.

In all villages at least one person has been trained in plumbing, for ongoing maintenance and minor repairs of the water supply systems. This person(s) worked alongside the plumber(s) from Gram Vikas during the process of laying pipelines, fitting taps, fixing valves, etc., and learnt how to operate and maintain the motor.

In many villages, the same person has continued at the post for several years. The VDC fixes the remuneration for the plumbers and pump operators, though in some villages the post is voluntary. The work of the pump operator is reviewed periodically by the VDC and his appointment is usually renewed at a meeting of the entire village.

- The highest remuneration is in Dengapadar (1997), where the pump operator is currently paid ₹6,500 per month through contributions from households.
- Raja Rao, who operates the pump and takes care of repairs in Kanamana (2010), is paid ₹5,000 per month; he is also President of the VDC. Recently the village invested in a sensor system to run the pump, whereby he can run the pump through an IVRS interface on the phone. Raja Rao fixes broken pipes and taps in houses, which are purchased by the family. He does not charge extra for his service.
- Angarpada (1998) has appointed four operators, and pays them ₹1,000 each per month. The operator of the main tank earns a little more, and stays in the rooms below the water tank. The land where the tank is located belonged to him, which he donated to the village.
- Two operators are appointed annually in Tarava (2001) and they are remunerated in kind. Each family gives them 7 kg of rice, which works out to a total of around 230 kg of rice per operator for the year.
- In Anusahi (2001) and Tala Landusahi (2006), where water from springs is accessed, the operators work on a voluntary basis. Their main tasks are to operate the gate valves and ensure there are no damages to the pipeline. In Anusahi, Enosh is the sole operator, while in Tala Landusahi, the operator is changed every month.
- Women operate the pump on a voluntary basis in two villages: Shanti Jani, who is also President of the VDC in Gramdebati Talasahi (2022) and two women in Bandipahad Sadakpada (2015).
- Dumerjore (2013) is the only village where the operator is paid by the panchayat, which also takes care of the electricity bill. The VDC decided to top-up the operator's rate of ₹1,000 per month from the panchayat, with ₹500 through collections from the village.

In almost all villages, Gram Vikas conducted masonry training during the construction process, training up to 8 to 10 people in some villages. In addition to building local capacities which could help with building the large number of toilets, bathing rooms and the water tank at the start of the programme, this also ensured that the trained people had a future income stream from the village and neighbouring areas.

The biggest benefit of training local persons in plumbing and masonry is that future needs for most repairs were serviceable within the village itself, accessible when needed, and at reasonable costs.

Ensuring Water Quality

Cleaning the water storage tank is important from a hygiene perspective. In all villages, the VDCs have set up a schedule and protocol for cleaning the tanks; the water tanks are cleaned 2-6 times in a year. The water storage tank is emptied and scrubbed, an activity which takes a few hours to complete. Some villages have a mechanism for payment for cleaning of the tank, in some the work is voluntarily done by whoever shows up, while in others it is done on a rotational basis, where households are allotted work in turn to clean the tank. Anusahi (2001) had a system where an announcement seeking volunteers to clean the tanks was made by a village public address system.

Villages which depend on spring sources have an additional activity in that they have to clean the collection chambers at the spring source, as well as the filter beds in the filter tanks – if there is one.

Water quality testing has been undertaken in a few villages in recent years. The VDCs report that the lab reports indicate good quality water. The taste test, however, is most common, and if there is a problem, the VDC takes immediate steps to address it, as reported in Bandipahad Sadakpada, Dengapadar and Kanamana, demonstrating a client and purpose orientation of the VDC.

4.2.5. Efforts to keep costs low by evolving operational norms and rules

VDCs have formulated various operational norms and rules to manage their drinking water supply systems. The norms are a form of shared understanding that have developed over time, while the rules specify what is required, prohibited, or permitted, and may be backed by the threat of sanctions.

VDCs conduct extensive processes of consultation with villagers, to arrive at rules for water distribution timings (which vary over the year, with restricted supply in summer), operator appointments and compensation, water fee rates, water fee collection systems, regular maintenance of the water supply system (cleaning and quality testing), repairs to drinking water supply system (tanks, motors, pipelines, gate valves, taps in households, etc.), financing of repairs, the status and use of the corpus fund, conditions for new water supply connections, decision making and reporting back, fines and sanctions, meeting resolutions and record keeping, and the election of VDC members and office bearers.

Timings for water supply

- "Earlier it took less time to fill the tank"; "Now there is a shortage for at least three months – April, May and June". These are common observations shared by people in many villages – Dumerjore (2013), Gramdebati (2009), Anusahi (2001), T. Landusahi (2006), and Tarava (2001).
- "Water availability is not a problem, we used to get water for 24 hours - even at night ghir-ghir ghir-ghir. And now since we have not paid the electricity bills the supply has been cut and we cannot pump water," shared a woman in Beheraguda (2010).
- "Water is costly. We have high electricity bills, hence we regulate supply even though there is adequate water" – villagers in Kanamana (2010) and Dengapadar (1997).

Situations such as these have resulted in VDCs making norms for the supply of water. All villages reported regulation of when the water motor is run, and the release of water from the overhead water tank at specific times. In most villages water is released from the tank twice a day, in the morning and evening. In Anusahi (2001) water is released from the tank once a day "since people leave for work and if the tap is left open, water goes to waste".

These norms established by VDCs are adaptive responses to balance usage with water availability in bore-wells, dug-wells, and springs, and also to control costs.

Equity concerns

Water not being available on tap throughout the day has different implications for different sets of people in the village.

- The common response is for families to invest in storage facilities in their own homes. These include 200-litre plastic drums or other large vessels which are used to collect and store water when it is released from the overhead storage tank in the village. In some villages we saw sumps being built near the bathing room to collect and store water.
- A few better-off families have started to invest in private bore-wells/ dug-well in their own homes – this was reported in 5 out of 11 villages. In some villages these resources are shared by neighbours (who may also be related to each other). Currently there are no norms on individual/ private extraction of groundwater.
- A practice which was flagged as a concern by VDCs was the use of small motors to pump and draw water from the main pipeline into storage facilities inside the house. This skews water availability at the time of supply, especially for tail-end users, and causes shortages. VDCs have attempted to ban the use of personal motors to lift water from the main pipe by imposing fines in Dengapadar (1997), Tarava (2001), Kanamana (2010), and Beheraguda (2010). However, in practice these fines are not easy to enforce and one VDC president admitted that they had not actually fined anyone. Large villages like Angarpada (1998) and Kanamana (2010) have hamlet-wise monitoring committees to discourage this practice.

Metering is being considered in some villages. Water meters were installed in Gramdebati Talasahi (2022), but are not yet being monitored. Angarpada (1998) reported installing meters many years ago, but abandoned them due to concerns about accuracy, and so on. The norms keep evolving according to the villagers' needs, and depend on how vocal they are in bringing an issue to the notice of the VDC.

Issues related to water availability and water pressure come up periodically in different villages, and the VDCs typically respond to the concerns raised. There are always some households which are not served adequately, but the system adapts and continues.

- In Angarpada (1998), 14 families in one section were not getting enough water. The VDC resolved the issue by laying a new pipe and switching the connection to a different water tank in the village. This seems to have eased the problem. The families and the VDC shared the costs for this.
- Similar issues are currently being faced in Dumerjore (2013), where families in Purantola are not receiving water. The VDC tried to address this by diverting the connection to a smaller tank in the village, however the issue has still not been resolved, and four families depend on public water sources.
- Pressure differences and low water supply have been addressed by the use of gate valves to regulate water release in Anusahi (2001) and T. Landusahi (2006) both of which have spring-based supply. Gate valves are also used in Tarava (2001) and Angarpada (1998), which depend on bore-wells, and where houses in the habitation are dispersed over a large area.

Periodic and ongoing collections

All the VDCs have a savings bank account for their maintenance fund. The system of collections of funds varies among the VDCs, and can be monthly, quarterly, annually (at the time of harvest) or a one-time/ one-off collection. These funds have been crucial for VDCs to meet their ongoing expenses: paying electricity bills for electricity to run the motor which pumps water to the water tank; to pay the pump operator; to undertake motor repairs or replacement if it gets damaged; to replace gate valves or leaking pipes, or any other expenses needed to keep the piped water system working.

The quantum and periodicity of funds collected is related to the nature of the water source, whether it is dependent on solar or grid electricity and the size of the village. The amount of money to be collected and the mechanisms are contextually designed by the VDC and decided after consultations through village meetings. These decisions are periodically made and reflected in the meetings' register. The amount of money being collected has increased over time to meet the increase in costs.

- The high cost of electricity for operating the motor which pumps water from the bore-well or dug-well to the overhead water tank is of concern in many villages. There was mention of, "ever since Tata Power came," in at least five villages, and some VDCs cited irregularity in the receipt of electricity bills.
- In Kanamana (2010), the VDC increased the monthly amount collected from ₹50 per household to ₹30 per person, to ensure equity, so larger households consuming more water per capita, pay more. There are separate charges of ₹500 per month for commercial establishments and ₹600 per household for a private function or festival. Dengapadar (1997) and Beheraguda (2010) also levy water charges on households for private functions.
- Angarpada (1998) was using an LI electricity point for pumping water (at ₹2/unit) that was recently shifted to a commercial tariff (of ₹6/unit), which has forced the VDC to increase its collections. When water supply was introduced in 1998, each household was paying ₹10 per month. Currently the VDC collects a monthly amount of ₹50 per household and ₹1,000 from the panchayat which draws water every Sunday during the village haat. VDC members shared that there is a proposal to double these amounts after discussion with the villagers.
- Dengapadar (1997) had made arrangements to keep their electricity costs low, though they realise that "this is an adjustment, and may not be sustainable".
- Dumerjore (2013) was the only village where the panchayat handles the cost of electricity, along with that of a neighbouring village, Baniguni.
- When we discussed the situation of the panchayat paying the electricity bill with VDCs, most of them were sceptical. In Angarpada (1998), the VDC said they did not want to hand over the water supply system to the panchayat, since the "Panchayat will not respond in time if there is any problem in the system." They had seen this in one of the villages which had handed over the operation of the system to the panchayat; there the VDC had also stopped taking monthly collections for maintenance, so when problems arose they were left high and dry.

Rules for fines

Though many villages have norms for fines, these are not strictly imposed (the fines are not levied, broken taps are not repaired, etc.). The system is resilient, because their threshold is high; even if a few do not pay for a while, others keep paying and costs are low, so the system continues. The tolerance for non-compliance is fairly high, and most VDCs allow considerable latitude for delayed payments. In the long run, the system tries to ensure that everyone comes on board.

- The VDCs of Dengapadar (1997), Angarpada (1998), Kanamana (2010), and Dumerjore (2013) shared that they have a system of fines if people do not pay their monthly charges on time. However, in practice the fines are rarely imposed. Instead, the VDCs have adopted the practice of giving a 'red notice' or using 'hard language' to get the payments, or use discretionary 'veto power' to make sure all households pay the amount on time.
- In Dumerjore (2013), the water supply connection to one family was cut after repeated reminders. Dengapadar (1997) imposes a nominal fine of ₹1/month of delay.

Raising funds from common pool resources

The VDCs have set up a practice of adding to their maintenance fund from common resources, apart from the collections from individual households. In many villages the VDC was responsible for planning and supervising these activities.

- In some villages, the harvest from the common pond or forest was sold and part of the income was added to the common fund.
- Another common method to raise funds was through the contribution of labour for a common activity, such as building a drain or cleaning a pond (from panchayat funds, MGNREGA or other grant funding); instead of taking individual payments, the money would be added to the maintenance fund account.

These collective activities with voluntary labour contributions by households in the village also ensure an overall sense of cleanliness and foster well-being and community cohesion.

4.2.6. Creating spaces for women and fostering dignity and pride

Living in these villages, with water-on-tap in the households, toilets and bathing rooms for each family, and clean surroundings, has become a status symbol.

The VDC ensures there is no litter in the common areas of the village, a practice instilled in the early days of the intervention and reinforced by the VDC over time. Women have taken the lead in some villages to establish methods of waste segregation and waste collection in collaboration with the panchayat.

- In Dumerjore (2013) a women's self-help group (SHG) works to spread awareness on segregation of waste, and has taken a contract for waste-collection and recycling. The group also manages the waste segregation centre at the panchayat.
- In Angarpada (1998) women have worked to establish segregation practices at home. Waste is periodically collected by the panchayat.
- Households take the initiative to use 'grey' water from bathrooms to grow vegetables in many villages, though some villages like Kanamana (2010) and Dengapadar (1997) are also worried about water wastage. Hamlet sub-committees appointed by the VDC monitor this to ensure there is no waste of water from bathrooms.

Women shared how toilets, bathing rooms, and piped water supply have changed their lives. There is reduced drudgery, they save time and can care for their homes and children. They also spoke of the reduction in water-borne diseases, leading to reduced health expenses, and better health and productivity.

- Jharna Kujur in Dumerjore (2013) said, "Our village is like a town". Toilet use is synonymous with dignity and progress. Women reported that toilet use is widespread despite variations in the water supply, and water on tap not being available all the time. They insist "there is no open defecation, at least in the vicinity of the village".
- In many villages when piped water is not available, people collect water from the dug-wells and hand pumps for using and for cleaning toilets, as "toilet use has now become a habit". Women are especially vocal about this and explain that having toilets in their homes is a matter of pride and dignity.
- The presence of piped water supply and toilets in the home was mentioned in many villages as a point on an informal checklist of marriage suitability for young grooms and brides.
- Young girls free from household responsibilities to fetch water or care for siblings, go to school. It is common for them to complete high school and even study beyond, and get jobs.

Deliberately carved spaces for women through SHGs, separate meetings for women, and their having positions in the VDC, ensure that women's voices are heard.

- The number of women SHGs, which started with thrift and credit, has increased in all the villages. They have monthly savings of ₹50-100 per member. Women keep internal records of the groups, and also bank records and passbooks. While some of them have taken up individual and collective livelihood activities, their primary purpose is to circulate credit amongst themselves. Many women have taken support from Mission Shakti.
- The women's groups also work closely with the ASHA and anganwadi workers. They discuss issues of water supply in the meetings. The SHGs are close counterparts to the VDCs in managing the water supply and sanitation systems in the village.

There is a positive spiral of outcomes driven by the intervention, whereby the community takes pride in being part of the village. This in turn supports the work done by the VDCs. Women experience immediate benefits as a result of the interventions, and this motivates them to ensure that the system continues to work. They also take new initiatives for individual and collective benefit.

05

WASH-related Outcomes of Gram Vikas' Interventions in Odisha and Global Benchmarks

The Sustainable Development Goals (SDGs) 2015 make specific mention of WASH in SDG 6: Clean Water and Sanitation - Ensure availability and sustainable management of water and sanitation for all:

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all

6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

To track progress toward these, the World Health Organization and United Nations Children's Fund's Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) produces internationally comparable estimates of progress on drinking water, sanitation, and hygiene (WASH) (WHO/UNICEF, 2023).

JMP's Service Benchmarks for WASH and the Gram Vikas Intervention

The Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) has developed Service Ladders to benchmark and compare service levels across countries. These are used for SDG monitoring on the 'improved/unimproved' facility type classification. In terms of the parameters defined by the JMP, Gram Vikas supports village communities to build the highest service levels for drinking water, sanitation and hygiene.

Safely managed drinking water facilities: Drinking water from an improved source that is accessible on the premises, available when needed and free from faecal and priority chemical contamination (JMP definition).
Gram Vikas's intervention goes a step further, and ensures piped water supply through two tap connections to each household.

Safely managed sanitation: Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated off-site (JMP definition).
Gram Vikas promotes individual pour flushes which are connected to twin leach pits, ensuring in-situ safe disposal of excreta.

Basic hygiene: Availability of a handwashing facility with soap and water at home (JMP definition).
By providing tap water connections, Gram Vikas ensures there is a reliable hygiene facility at home.

5.1. Gram Vikas Status Assessment Survey

In most villages where Gram Vikas has its water supply and sanitation programme intervention, its handholding support to the VDC is typically withdrawn after the initial year of operation. These VDCs then work as self-managed systems.

Gram Vikas carried out a Status Assessment Survey (SAS) (Gram Vikas, 2020) between August 2018 and January 2020, to assess the status of the piped water supply and sanitation infrastructure, and the institutional systems for community ownership and management of the WASH systems it had helped village communities in Odisha create.

The first phase (August 2018) covered 846 villages in 69 blocks across 10 districts focused on collecting data on the management of community institutions, corpus and maintenance funds, and functioning of the water supply systems. The second phase (January 2020), covering 626 villages of the 846, focused on collecting data on household profile, physical status of the toilets and bathing rooms, availability of water, and use of the toilets and bathing rooms.

The SAS covered even those households that were not there at the time of Gram Vikas's intervention. These 'new' households comprised 25 per cent of the total at the time of the survey. Households that were part of the intervention facilitated by Gram Vikas (n=31,255) are referred to as 'old' households. The 'old' and 'new' households together are 'all' households (n=41,586). The results from the SAS have been compared with data at the state, national, regional, and global levels.

5.2. Benchmarking quantitative outcomes of WASH interventions

Based on available data sets, the following tables compare the WASH status in villages supported by Gram Vikas with global, national and state-level indicators in proximate years.

BENCHMARK 1: Comparison With JMP Data (WHO/UNICEF 2023)

JMP Data (2020)	**World (Rural)**	**India (Rural)**
Safely managed %	60	56
Piped water connection %	42	31.7

Gram Vikas data (2020)	**SAS: ALL (OLD+NEW) households**	**SAS: OLD households**
Safely managed piped water connection	75	92

Among the households in the area under Gram Vikas's intervention studied in the SAS, 75 per cent have safely managed piped water connections (under ALL households) and 92 per cent (under OLD households). This is significantly higher than the country average of 31.7 per cent households with piped water connection in 2020 and 42 per cent households at the global level.

JMP Data (2020)	World (Rural)	India (Rural)
Safely managed sanitation (excluding shared) %	43	50.5
Gram Vikas data (2020)	**SAS: ALL (OLD+NEW) households**	**SAS: OLD households**
Safely managed sanitation (toilets and bathing rooms) %	75	95
Safely managed sanitation (toilets only) %	4	

Less than half the world's rural population has access to safely managed sanitation services. In India around 50 per cent of the rural population had safely managed sanitation facilities in 2020.

- At 79 per cent for ALL households and 95 per cent for OLD households, the population with improved sanitation facilities is higher in villages under Gram Vikas's intervention, compared to the global and national coverage.

The JMP report, 2023, states that 58.7 per cent of the population in India have bathing facilities at home.

- From Gram Vikas's SAS survey, 75 per cent of ALL households have access to a separate bathing room with piped water, and so do 95 per cent of OLD households. These contribute to better hygiene outcomes for the household, and have positive implications for improved menstrual health of women and girls.

BENCHMARK 2: Comparison with Government Data – the Jal Jeevan Mission and the SDG India Index 2020-21

The SDG India Index & Dashboard (Niti Aayog, 2021) measures India's progress towards the SDGs at the national and sub-national levels. The following data relates to progress on SDG-6. The Jal Jeevan Mission (JJM), Government of India tracks piped water supply to rural habitations and households, which is tracked on its web-portal (Jal Jeevan Mission 2023). It also contributes to the JMP data collated by UNICEF and WHO. Since the start of the JJM in 2019, there has been an exponential growth in extending piped water connections to households in rural areas.

Rural population getting safe and adequate drinking water within premises through pipe water supply (%)	**India**	**Odisha**
JJM Aug 2019	16.8	3.51
JJM Oct 2023	69	65
SDG India Index SDG 6 (2020-21)	51.36	51.73
GV SAS data 2020	**ALL HH**	**OLD HH**
Households with piped water supply connection in household (%)	75	92
Households with functional household tap connections at the time of survey (%)	65	80

It can be inferred that coverage of households with piped water connections in villages with the GV intervention, even as of 2020, is higher than the achievements in India and Odisha in later years. The Gram Vikas SAS also collected data on tap connections that were functional at the time of the survey, and the data of ALL households for 2020 (65%) comes close to the JJM data for 2023, but is significantly higher for OLD households (80%).

BENCHMARK 3: Comparison with NFHS 5 (2019-20)

The National Family Health Survey (NFHS-5, 2019-21) data documents the proportion of rural population living in households with an 'improved drinking water source' and 'improved sanitation facility'. Its definitions are as follows:

- Improved Drinking Water Source: Piped water into dwelling/yard/plot, piped to neighbour, public tap/standpipe, tube well or borehole, protected dug well, protected spring, rainwater, tanker truck, cart with small tank, bottled water, community RO plant
- Improved Sanitation Facility: Flush to piped sewer system, flush to septic tank, flush to pit latrine, flush to don't know where, ventilated improved pit/biogas latrine, pit latrine with slab, twin pit/composting toilet, which is not shared with any other household. This indicator does not denote access to the toilet facility.

NFHS-5 2019-20 (%)	**India**	**Odisha**
Population in households with improved drinking water source	94.6	81.7
Population using an improved sanitation facility	64.9	58

GV SAS Data (2020) (%)	**ALL HH**	**OLD HH**
Population in households with safely managed piped water facility	75	92
Population in households with safely managed sanitation facility	79	95
Population in households using safely managed sanitation facility	60	74

The data sets are not directly comparable as the facilities in Gram Vikas supported villages in Odisha are of a higher standard adhering to safely managed water supply with piped water supply to each household and safely managed sanitation with a flush to twin leach pits. Bearing this in mind, availability of safely managed piped water and sanitation facilities in Gram Vikas-supported villages is high (92%) for OLD households.

BENCHMARK 4: Comparison with NARSS data (2019-20) – access and functionality of toilets

The National Annual Rural Sanitation Survey (NARSS) (Ministry of Jal Shakti, GoI 2020) also assesses the country-wide situation on sanitation and hygiene. The NARSS Round-3 (2019-20) was conducted between November 2019 and February 2020.

	NARSS – 3 (2019- 20)		GV SAS (2020)	
	India	Odisha	ALL HH	OLD HH
Households Surveyed (no.)	91,934	4,134	41,586	31,255
Households having access to toilet facility (%)	94.4	89.6	79	95
Households having functional toilets (%)	96.4	84.2		
Rural population using safe, functional & hygienic toilets (%)	85	61.8	60	74
Households with toilets and water in premises (%)	73	47.9		
Households with fully functional WASH systems – access to and using a toilet, bathing room, and functional household tap connection (%)			50	63

As the data sets show, there is a variation between the availability and use of toilets, at the national and state levels. This is seen in villages where Gram Vikas has intervened as well, and can be attributed to various factors, significant among which are the availability of water, and the condition and usability of toilets. Other factors affecting toilet-use include occupational patterns and behaviour issues.

5.3. Locating Gram Vikas's interventions vis-à-vis government policies and programmes for WASH

The biggest difference in Gram Vikas's approach and the government programmes is that the former views piped water supply and sanitation in conjunction and complementary to each other, and not as stand-alone initiatives. Moreover, in Gram Vikas's approach, participation of and ownership by the community are central features.

Sanitation and drinking water supply are part of the State List subjects in India, however the Centre plays a significant role in defining policy contours, making financial allocations, and providing technical support to states. A Total Sanitation Campaign was initiated in 1999 as a comprehensive approach to address rural sanitation. The Nirmal Bharat Abhiyan (2012) took a more comprehensive approach to addressing rural sanitation, a process which gained impetus in 2014 with the launch of the Swachh Bharat Mission with the objective of making India open-defecation free by 2019.

> Gram Vikas's intervention in water and sanitation was initiated two decades before the national government started its mission to end 'open defecation' in villages. Gram Vikas's experiences from Odisha contributed to the formulation of the Nirmal Bharat Abhiyan, precursor to the Swachh Bharat Mission.

In 1972 the Accelerated Rural Water Supply Programme (ARWSP), a centrally sponsored scheme for providing rural water supply as a part of the Minimum Needs Programme, was launched. In 1999, in line with the Millennium Development Goals, a separate Department of Drinking Water Supply was set up by the Government of India. The Ministry of Rural Development launched sector reform initiatives to provide drinking water to all water-scarce villages in the shortest possible time and at least cost, and focusing on the gram panchayats. Rechristened the National Rural Drinking Water Programme (NRDWP) in 2009, the programme was restructured in 2017 with a focus on sustainability of its schemes. In 2019 the Jal Jeevan Mission, Ministry of Jal Shakti, was established, which set the target of providing water on tap to all households (har ghar jal) by 2024.

> Gram Vikas was a member of the Working Group of the Planning Commission on Rural Domestic Water and Sanitation for formulating the Twelfth Five-Year Plan (2012–17) and part of the National Task Force set up in 2019 by the Jal Jeevan Mission to review the implementation of rural drinking-water schemes. The Jal Jeevan Mission has acknowledged the Gram Vikas model for rural drinking water and sanitation.

5.4. Benchmarking qualitative outcomes of WASH interventions

Qualitative outcomes through WASH interventions in communities, include disease and morbidity reduction, drudgery reduction, and community inclusion. Evidence from external studies conducted in villages where Gram Vikas has worked in Odisha (referred to as WASH systems in Odisha in this section), has been juxtaposed against comparable global evidence from studies on similar parameters.

5.4.1. Disease and morbidity reduction

Reduction in Morbidity and Disease: Global Evidence

A significant portion of the disease burden arising out of unsafe drinking water, along with poor sanitation, is attributed to diarrhoea. Drinking water interventions have a significant impact on reducing the risk of childhood diarrhoea. As compared to an unimproved source, the availability of water supply on premises with better water quality resulted in the reduction of diarrhoea by 52 per cent. Moreover, when water is treated at the point-of-use through filtration, solar treatment, or chlorination it leads to a 50 per cent reduction in diarrhoea vis-à-vis when untreated water from an unimproved source is consumed (WHO, UNICEF & World Bank, 2022).

It is essential to have access to sufficient safe water for managing morbidity associated with neglected tropical diseases like trachoma, schistosomiasis, and soil-transmitted infections. Safe water is required to reduce or stop the transmission of infection and prevent it from rebounding (WHO, UNICEF & World Bank, 2022).

Evidence from WASH systems in Odisha

- An interrupted time-series analysis (Duflo, 2015) of nearly 100 villages where Gram Vikas has intervened, shows that as a result of the integrated water and sanitation intervention there was a reduction of 30-50 per cent in episodes of severe diarrhoea. Formal tests for persistence of the results showed that the impact persists for more than five years.
- A study in Haradango village (Baluchova, 2017) concluded that the WASH project is sustainable and could be applied in other parts of Odisha state or even further in India. It verified an 80 per cent reduction in water-borne diseases as a result of the programme.
- A matched cohort study conducted between June 2015 and October 2016 (Reese, 2019) randomly selected 45 intervention villages from the group where the intervention had been completed five years ago and matched them to 45 control villages. Access to a household-improved toilet was almost five times higher in the intervention villages than in the control villages (85.0% vs 17.7%. It was found that the prevalence of soil transmitted helminth (STH) infection among children in the intervention villages was half as much as that in the control villages. Intervention villages also saw a smaller proportion of stunted and underweight children under-5 compared to the control villages. It found evidence of the protective effect of the intervention on infection with any STH in children.

- Studies in Samiapalli village where WASH infrastructure was developed in 1995 concluded that even after 25 years, with access to clean water and healthy hygiene there are lower incidences of skin diseases, and coughs and colds, and improved women's menstrual hygiene (Water Aid, 2019). Another study observed that the functioning WASH system has led to a reduction in gynaecological diseases among women and in water-borne diseases in the village (Pless, 2012).

5.4.2. Impact during COVID

Studies through telephonic data collection in Tamil Nadu, and in-person data collection in Ethiopia and Kenya, found that at least 85 per cent of the respondents resorted to handwashing as a COVID prevention measure. Well-functioning WASH infrastructure enabled the population to follow preventive steps like washing hands and staying indoors because they had access to a latrine and handwashing infrastructure at home (Bauza, 2021).

- The same study conducted in rural areas of Odisha showed that the WASH infrastructure helped the communities develop better hand washing habits during the spread of COVID-19. The majority of the respondents (86%) reported a change in their hand washing routine in response to the pandemic (Bauza 2021). The reported changes were mostly positive, i.e., an increase in the frequency of handwashing, and the usage of soap and a more thorough hand washing technique. The handwashing techniques of children also mirrored the handwashing technique of the adult members of the household. Access to water in their premises enabled household members to wash their hands frequently and stay home.

5.4.3. Drudgery reduction

Global evidence: When drinking water has to be collected from a distant source, women and girls bear the disproportionate burden of the arduous task. This adversely affects their health and safety. When girls are involved, it adversely impacts their school attendance and completion (WHO, UNICEF & World Bank, 2022).

India evidence: A national survey in India in 2018 found that water was collected from off-premises sources by 40 per cent of rural households and 20 per cent of urban households. Households in rural areas reported making two to four trips for fetching water every day. In one-quarter of the rural households, with off-premises water sources, women and girls ended up spending more than 50 minutes per day fetching water, whereas this was 4 minutes per day for men. Among the 64 million households where water was fetched by women from off-premises sources, almost 50 million person-hours were spent by women to fetch water each day, and almost 90 per cent of this burden was borne by rural women (WHO, UNICEF & World Bank, 2022).

Evidence from WASH systems in Odisha

- In the matched cohort study (Reese, 2019), it was found that the 45 villages which had Gram Vikas interventions showed a positive association with minor improvements in round-trip time to the water source, even though it was with higher prevalence of water intermittency, in all likelihood due to greater dependence on the piped system in the intervention villages.
- Another study stated that as a result of Gram Vikas's efforts, the availability of piped water within the household premises eliminates the drudgery of women, who no longer have to spend 4-5 hours a day fetching water and can use the time to engage in economic activities (Pless, 2012).
- In field studies conducted by us, women spoke of the advantages of piped water supply, leaving them with more time to care for their children and for leisure or economic activities. Drudgery reduction was a significant factor why girls of marriageable age seek to marry into villages which have similar facilities of piped water supply, private toilets, and bathing rooms.

5.4.4. Community inclusion

Global evidence: There has been unequal distribution of available water resources based on region (rural v/s urban), gender (women v/s men) and social identity (caste, Indigenous groups). A study conducted in six countries in Latin America and the Caribbean found that there is a 19 per cent difference in access to piped water between Indigenous and non-Indigenous people (WHO, UNICEF & World Bank, 2022).

India Evidence: A study across five Indian states reveals lower rates of water availability within the premises for SC households (Dutta, 2015). It also shows a differential pattern across regions where destitution, physical separation of hamlets, ideas of purity and pollution, and discrimination in the access to public water bodies and structures, etc., play a decisive role. Women from SC households especially face severe challenges in fetching water, including physical violence.

Evidence from WASH systems in Odisha

- The study conducted in Haradango village (Baluchova, 2017) found that all the people, irrespective of their caste, class, and educational levels had their own voice and that their votes held equal value in decision-making about the programme's functioning. Members of all caste and class groups are proportionately represented in the village committees. Women got a chance to play a role outside their families as they have not only been responsible for the maintenance and monitoring of water supply and toilets, but have also handled interactions with government and bank officials among other outsiders. Women, whether they were poor, widows or Dalits found that their voice held as much importance as their more privileged counterparts. The study stated that Gram Vikas, through its water and sanitation programme, has had an impact on not only the health of the population, but has also helped women break their shackles and dismantled other social barriers that have caused discrimination against the marginalised. The authors highlight the fact that, based on the Gram Vikas experience,

something as basic as providing WASH infrastructure can generate sustainable change, not only by reducing water-borne diseases and child mortality, but also by uniting divergent strands within communities.

- The study of the Samiapalli Piped Water Supply System (Water Aid, 2019) states that the requirement of equal participation of men and women in the general body and village committee helped in making the processes inclusive. The participation of women resulted in their having their voices heard, and taking part in decision-making processes. Over time their confidence improved. Though, even when the case study was carried out in 2019, the women would maintain their physical distance from men during meetings, but the intervention managed to redefine the gender equations in the village and succeeded in placing women in leadership roles.

5.4.5. Affordability of WASH systems

Global evidence: JMP/GLAAS states that it is essential that a WASH system is affordable for the population to be able to use it.

Five approaches that help gain insights into WASH affordability are:

A. How people behave with respect to WASH expenditure and service levels;
B. What people say about their preferences on WASH expenditure and service levels;
C. How WASH expenditures compare to an agreed benchmark on WASH spending as a proportion of a household's earnings and expenses;
D. What is a household's poverty status, which indicates deservingness for supportive measures to ensure WASH services are affordable;
E. What measures are already in place to ensure economic access of WASH services to the poor and vulnerable (UNICEF & WHO, 2021).

Evidence from WASH systems in Odisha

- There is 100 per cent inclusion, and all families get the same service levels, the highest in the service ladders, safely managed piped water supply, and safely managed sanitation with private pour flush toilets with twin leach-pits. Poorer families are supported during the construction process.
- Capital costs as well as the costs of operations and maintenance of WASH systems in Gram Vikas intervention villages are affordable. The VDCs put in place mechanisms to leverage contributions from individual households, and where possible from the government, to meet the capital costs. Ongoing expenses are met through monthly collections agreed on by all the households in the village.
- Aside from shocks such as sudden damage to the motor or a break in the pipeline, the expenditures are within affordable limits. Instances of high electricity bills for pumping water have, however, proved to be a challenge and affected the functioning of water supply systems in two villages of the 11 we visited.
- The mechanisms for collection of a corpus fund and maintenance fund ensure that there is a high level of in-built financial sustainability across the villages.

06
Self-Managed Systems in Practice: Key Findings and Lessons

A self-managed system – like a self-generating forest – has its own interdependencies and changing roles.

The contextual design of the intervention, based on certain principles in the form of 'initial conditions', embed an experience for the village community to work together with creativity and imagination and in ways they were hitherto not accustomed to.

The condition of involving '100 per cent households' with all getting an equal level of services from the start, puts communities on a path of working together with a concern for everyone involved. These practices are difficult, and a struggle in the beginning, but VDCs draw on these experiences to do their work in the future. The incubation process thus generates an experience for the community. The VDC gets into the habit of addressing the concerns of all the individuals, ensuring equity, and removing obstacles for different subgroups within the community.

This is borne out by the findings of this study, which zooms in to closely study community- based self-managed systems in 11 villages. It also zooms out to look at qualitative and quantitative outcomes of interventions in integrated water supply, sanitation, and hygiene in rural communities at the global, national, and state levels, and in aggregates of villages.

From the analysis of these investigations, it is borne out with evidence that:

- Rural communities have the willingness and capacity to sustain self-managed systems over long periods of time. VDCs work with the core mandate of ensuring piped water supply to households in the community. This in itself presents a variety of challenges to which the VDC must respond in a timely and agile manner, with a service orientation to ensure that there is equity in the supply of water.
- The premise of 100 per cent inclusion is sustained to a large extent in terms of access to piped water supply and sanitation, even with the growth of population in the habitations. There is a growing demand for water, not just due to increases in population, but also due to changing behaviour, aspirations, and needs for water. This has to be matched with the reality of fluctuations in water supply, due to seasonal and broader climatic factors, as well as to overall demands on water resources. VDCs have been innovative in rule-making to match the demand with supply, and made efforts to augment sources of supply as well. Where the piped water system fails, it fails for everyone.
- The VDCs are largely democratic, and have leaders with conviction and management skills to manage complex processes. They make and enforce rules, have the capacity to adapt and respond to shocks, and make course corrections. Over the years there have been transitions and widening of leadership. Women have come to occupy a seat at the table, and play an active role in managing the system, and ensuring that water supply continues without disruption. The presence of local technical capacities to manage the infrastructure and troubleshoot when there are problems, are crucial factors in ensuring uninterrupted and well-functioning systems.
- VDCs put in place and enforce mechanisms to raise financial resources through community contributions and leveraging from panchayats where possible. These resources are deployed to meet on-going and emerging expenses.

- Self-managed systems are internal-facing, accountable toward the community and have a service orientation. They are also external-facing, have capacities to network with relevant government departments, participate in and raise resources from the panchayat, and seek technical support where needed to ensure continuity of their systems.

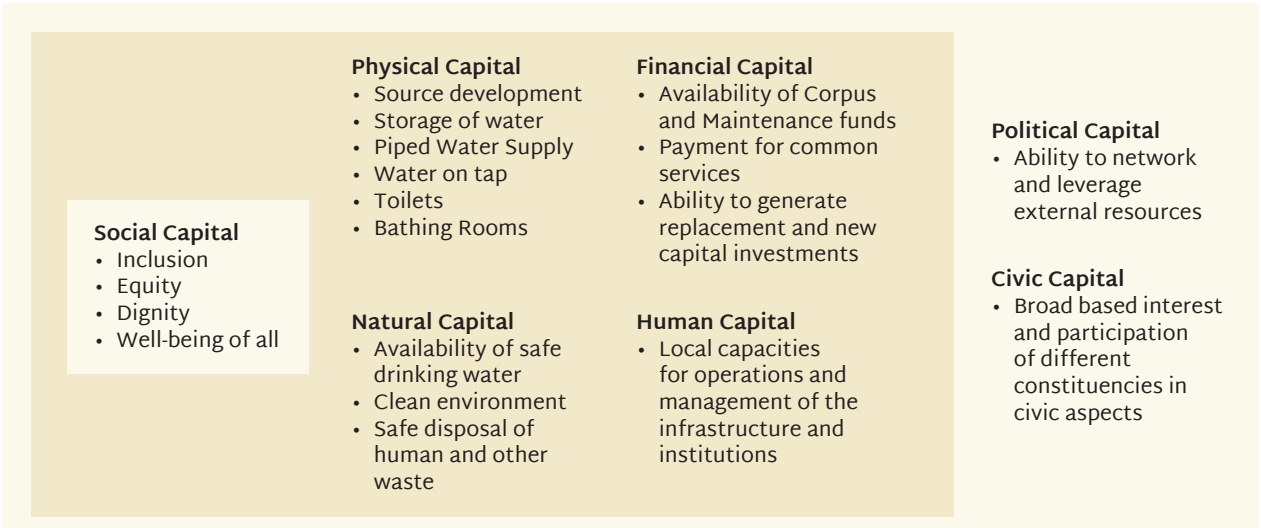
The outcomes of these are seen in continued access, the use and upkeep of the physical infrastructure, and improved outcomes within the villages in health, drudgery reduction and community inclusion in other development activities. Women take active interest in and participate in community processes. People take pride in their villages, and believe that their village rivals, and at times is even better than, what is available in urban areas.

The qualitative and quantitative data in this regard show Gram Vikas's interventions in villages in Odisha have resulted in equivalent and in many instances better outcomes compared to global, national and state-level benchmarks.

Harnessing community capitals in self-managed systems

The five principles which guide the 'initial conditions' put forth by Gram Vikas, and the on-going experience of village communities working together harnesses the social capital to develop the built capital for individual and collective benefit. The built capital includes the development of physical capital and natural capital. These are developed alongside the financial and human capital in the community. The experience of working together feeds into improved well-being and leads to ways to gradually enhance civic and political capital.

The self-managed systems represent a "healthy and vibrant ecosystem which is responsive to the social and economic well-being of its people, built through a dynamic interaction of its various capitals" (Mattos, 2015).



6.1.Aspects relevant for Gram Vikas's (re)engagement with self-management systems

Looking forward, these systems appear to be in need of reinforcements to address emerging issues in areas related to environment sustainability, social equity, and institutional continuity.

6.1.1. Environment sustainability

- As villages become affluent, the demand for water for drinking, irrigation and other uses increases, along with investments in private infrastructure to extract it. New norms, rules, and collective action strategies are needed to moderate this demand and maintain the long-term sustainability of groundwater and stream sources. The quality of water from its source to use also needs attention.
- The current and potential availability of water needs to be balanced by understanding the demand for it. This would have to be done at various levels – at the local habitation and village level, panchayat and watershed level.
- Climate change and extreme weather events are likely to further stress the hydrological systems. Catchment protection and management is needed to enhance water source sustainability.
- Recharge zones need to be identified and targeted for protection and soil moisture conservation, whilst addressing land-use patterns as well. The knowledge and capacity to undertake these actions at a local level is vital.

6.1.2. Social equity

- 'Participation of all' and 'equal participation of women' are not enforceable conditions, but deliberate processes that need attention and practice. In the normal course, after the initial push these tend to settle into a 'zone of comfort,' affecting voice and choice, and determine whose needs are addressed. Externally facilitated processes may be needed to ensure that the voices of marginalised and poor communities continue to be heard.
- Equity considerations for the most part are limited to water supply and sanitation. They do not automatically translate to similar practices in other aspects of the community's functioning. The journey to social change is slow and deliberate, and it cannot be expected that a one-time intervention around water and sanitation, however broad-based it may be, will sustain in perpetuity or manifest in other aspects of the community's working.

6.1.3. Institutional continuity

- For a VDC to take off as a self-managed system, the challenge before Gram Vikas is to know when to let go. Too early may lead to a collapse of the self-managed system, and too late may build high levels of dependence. A conscious process of role-transformation and withdrawal gives the community a taste of working independently.
- On the other hand VDCs need periodic reinforcements and nourishment. These relate to keeping the membership broad-based, involving both elders and youth, and ensuring leadership transitions. The concentration of power and decision-making in a few breeds dependence and, in some cases, corruption.

- Facilitating knowledge exchange and diffusion of experiences across villages and panchayats can enable cross-learning. The renewal of VDCs, with new knowledge and technical capacities can infuse self-managed systems with the ability to develop foresight and solve problems with fresh zeal.

In these interconnected facets, there is an opportunity for Gram Vikas to re-connect with communities with thriving self-managed systems, to re-invigorate their processes and together with them imagine new growth trajectories.

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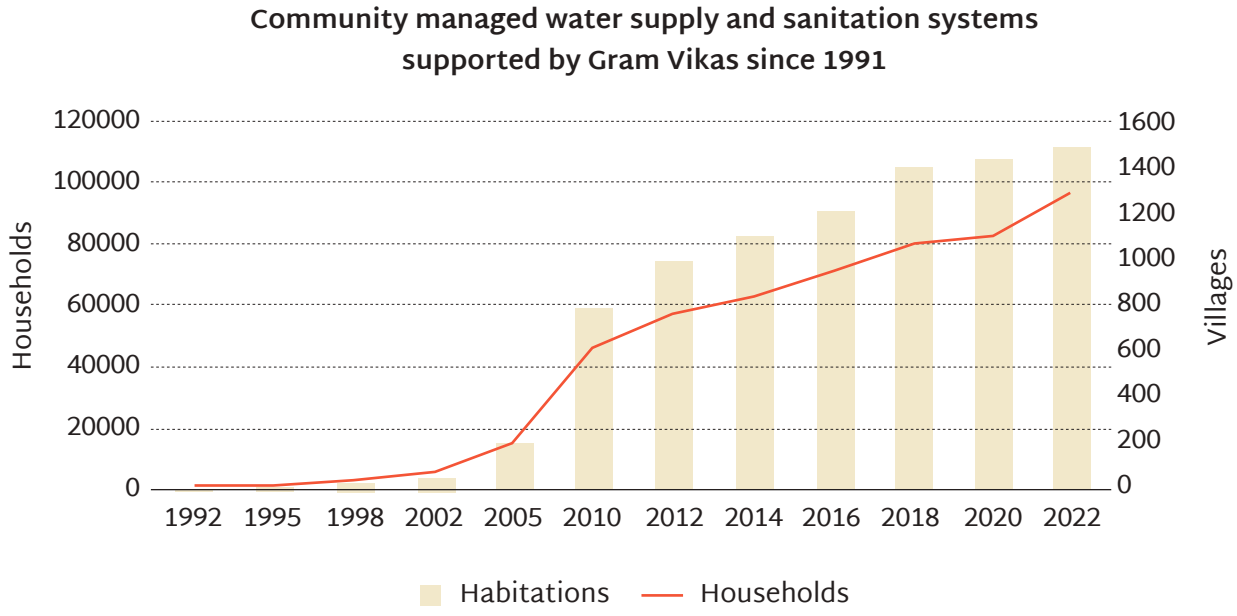
Annexures

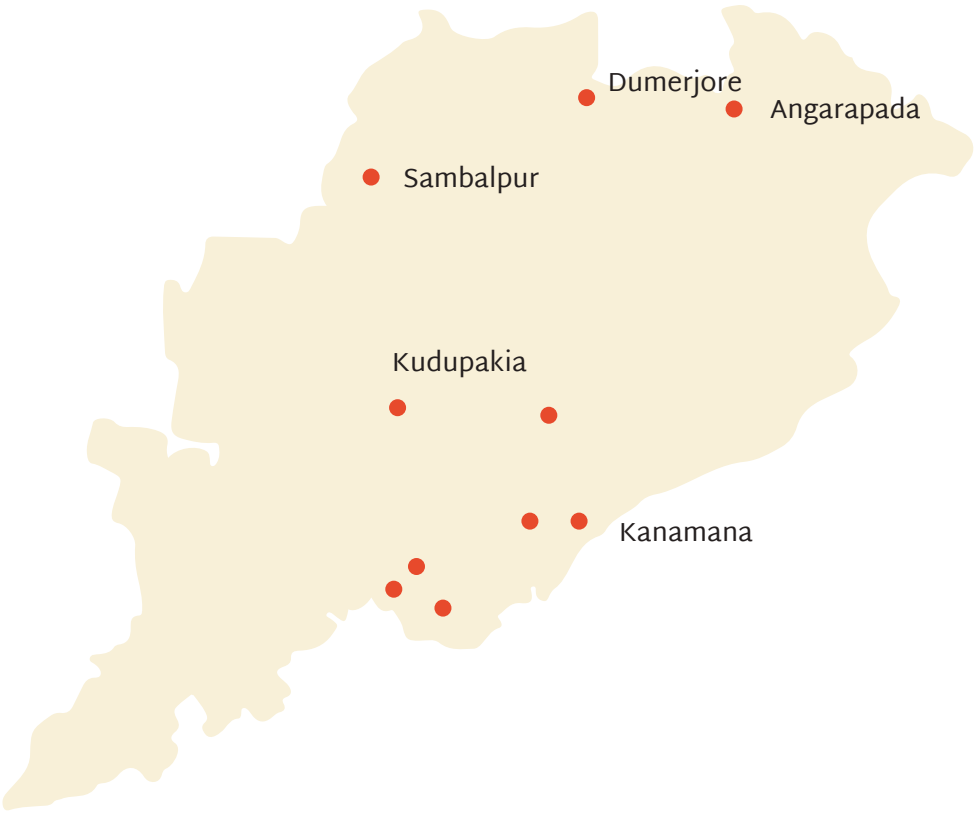
ANNEXURE 1
GROWTH OF GRAM VIKAS' WATER SUPPLY AND SANITATION PROGRAMME

The graph below details the growth of the programme indicating coverage of habitations and households over the years.



ANNEXURE 2
MAP OF LOCATIONS OF VILLAGES INCLUDED IN THE FIELD STUDY

Geographic spread and locations of the villages in Odisha which were part of the field study of self-managed systems.



ANNEXURE 3
VILLAGE PROFILES

- Listening to village communities was central to understanding self-managing systems in this study. Before visiting the villages, we conducted extensive background research, reviewing Gram Vikas records, village profiles, status assessments, and relevant data from previous studies.
- In the villages, we engaged in in-depth discussions with village committees and other stakeholders. These conversations, documented in individual village reports, were crucial for identifying patterns and understanding the commonalities and differences in how self-managed systems have functioned and thrived across these communities. The insights gleaned from these discussions formed the basis of our conclusions.

Annexure 3.1.

Angarpada Village, Angarpada Panchayat, Raruan Block, Mayurbhanj District

DISTRICT
Mayurbhanj

BLOCK
Raruan

GRAM PANCHAYAT
Angarpada

VILLAGE
Angarpada and Polasara

Households at start of GV's work (1994)	Households at the time of survey (2018)	Households at present (2022)
173	**234**	**265**

ST	SC	OBC	GEN
29	**29**	**166**	**9**

A panchayat with a difference

"The leaders of Angarpada Panchayat had deerghadrishti (foresight)," say the villagers of Angarpada.

The leaders saw potential for their village haat (marketplace) to become a place for cattle trade many years ago, as the village is located in close proximity to West Bengal and Jharkhand. In a tradition that has been ongoing for many years, every Sunday cattle traders gather to do business, also for goat, sheep and chicken. And with them come all other trades. A hyper-local market with diverse products and produce, it today rivals any modern commercial mall in cities. The panchayat currently earns a revenue of ₹70-80 lakh annually from the village haat. Over the years it has used the revenues wisely in a range of development activities and infrastructure in the villages within the panchayat. The high school in the panchayat was built with support of the panchayat, which also sponsored construction in the college in Raruan Block.

In the early 1990s, before the idea of toilets and bathing rooms became a common demand, the panchayat supported all families across the villages, as Gram Vikas worked with the communities. In addition to a toilet and bathing room, each family got water on tap in their homes from a common water distribution system. Angarpada village took the lead, and a water tank built near the haat providing water served as an inspiration for other villages. Visitors to the haat took this example back to their village, motivating other villages to join the programme.

Angarpada Panchayat has 11 wards. Angarpada village was the first to start the water supply and sanitation programme in the panchayat in 1997. Seeing the work done here, other villages gradually approached Gram Vikas. Now, the water supply and sanitation programme has been undertaken in all the wards which have tried to establish and manage similar systems with varying degrees of success. The panchayat received the Nirmal Gram Puraskar of ₹50,000 from the President of India in 2014.

Initiating community-managed water supply and sanitation

How Angarpada village jumped into this before anyone else in the area, and even in Odisha, is described in this narration here by the people in the village.

There were initially 5-6 hand-pumps in the village which were the main sources of water. Women would go at night to fetch water. "We used to go at 2 am, otherwise we wouldn't get sufficient water for our needs. We also had to fetch water for the cattle to drink. Some days we had to go four to five times to fetch water." Women shared that now, with water on tap in their own homes, girls from the village are reluctant to marry men in villages which have no toilets or piped water supply.

Gram Vikas first came to the village to implement the biogas programme in the 1980s. Many families had built biogas plants; 8-10 such plants are still functioning in the village. In 1997, the village secretary, who was a teacher, met some of the Gram Vikas staff in the market. They discussed Gram Vikas' new programme for water supply and sanitation in villages, and decided to share the idea with others in the village and held a meeting. "Initially not everyone was willing to believe that water could be supplied by tap to each family."

Contributing to the corpus fund

In the village at the time, there were 170 houses, of which 10 families refused to participate. Gram Vikas' condition was that each family had to contribute ₹1,000 to a village corpus fund which would be used for the perpetuity of the programme. The villagers did not have the money to contribute to the corpus, and some families also had constraints in building their own toilets and bathing rooms. Eventually, after much persuasion by the leaders of the village, the families came together. The panchayat supported with ₹500 per family for the corpus fund and individual families contributed ₹500 to create the corpus. The villagers' contribution could be in cash or in kind; the cash collected was placed in a fixed deposit. This has grown over the years, and together with other collections, there is ₹14 lakh in fixed deposits with the village committee today.

Forming a Village Committee

After the initial talks, the first committee was formed, with only men as members, which met

frequently, often hamlet-wise, to motivate families to join, and plan ways in which the programme could be implemented. The core team of 5-6 people met every evening from 6-7 pm to take stock of progress.

Subsequently three women were brought into the committee. The present village committee, which was reconstituted in 2022, has 11 women and 10 men. Members of the VDC meet regularly and make collaborative decisions.

Meeting the cost of maintenance

To meet the maintenance costs and electricity expenses, the village committee initially started collecting ₹10 per month from BPL families and ₹15 per month from APL families. This, over time, increased to ₹15 and ₹20, respectively. At present ₹50 per month is raised from all families. If a family cannot pay, the committee uses its discretionary power (veto power) to waive the fees. The charges are ₹200 a day for water supply for events and functions in individual households.

Till 2023, the electricity was being charged at a lower rate for agriculture. This anomaly was detected and the rates have recently been changed to commercial rates. There was also a fine imposed by the electricity department, which has been cleared by the village committee after negotiating with the electricity department. They used their fixed deposit for this payment.

The current monthly electricity bill is around ₹20,000. Given this, there is a proposal to increase household collections from ₹50 to ₹100 per month. There is also a proposal to hike the water charges levied on the panchayat from ₹1,000 to ₹2,000 per month for the water supplied to the village haat. The villagers also feel that a solar pump will help offset the increasing costs of electricity.

The committee takes care of monthly collections, with one person each responsible for their hamlet. There is a receipt book for the collections. In case of a default, a red notice is given to the family, which serves as a warning that their connection will be cut. In most cases families pay up with the red notice warning. About ten families were not making regular payments, but the situation was resolved after discussion with the families. The panchayat also recently paid their arrears in bulk, ₹30,000 for 2.5 years (October 2020 to March 2023). The village committee feels they cannot be too harsh and impose fines as this may lead to conflicts; they prefer to issue a warning and follow up with families individually. The village committee repaired toilets and taps to prevent water wastage; these costs were borne by the individual families.

All these decisions are taken through a consensus-building process across the village, and eventually agreed upon in the village committee meeting. The 12,000-litre water tank near the village supplies water every Sunday to the marketplace, for which the panchayat makes a monthly payment of ₹1,000 to the Angarpada village committee.

How the water supply system was developed

To meet the water needs of the village, an overhead water tank of 78,000 litres was built in 1998, and piped water supply to all households commenced. A tank of 14,000 litres was added in 2001, when it was realised that water was not reaching all the households. At the time, Member of

Parliament Smt. Kumudini Patnaik donated ₹1 lakh for the water supply programme. Two more water tanks (of 12,000 litres each) were added in 2005 and 2008, with support from the RWSS and technical support from Gram Vikas; one of these runs on a solar pump.

For construction of the main water tank, a roster was created for labour contributions by each family; some better-off families contributed in cash. A few people from the village therefore got employment building the water tank.

The main overhead water tank developed leaks over time. They made a request to the panchayat but were unable to leverage the money to repair it. The water tank was eventually repaired in 2022, with ₹70,000 from the village committee. The village approached Gram Vikas for technical support and masons. The head mistri was provided by Gram Vikas, and labour contributions were made by the villagers. So far the tank has been repaired internally; painting and repair work on the outside have been delayed due to a lack of funds. At that time, the scaffolding will have to be redone as it has decayed.

The main source of water for the tank is a bore-well, which had been drilled in 1997 to a depth of 300 ft and is still functional. The pump motor was placed at around 90 feet below ground level; the water depth continues to be high (around 10-15 feet below ground level) despite the well having been operational for over two decades. Additionally, there are two bore-wells (one constructed in 2022); one of these is currently being used.

With the increasing demand for water, and shortages in supply especially in summer, there are now rules regarding timings for the release of water.

In the last 2-3 years over 30 families have installed personal motors and overhead plastic Sintex tanks in their homes to store water. This poses a new challenge for equitable water distribution, as the motors suck up the water, leaving less for the households which are further down the pipeline. Better-off families with concrete roofs are able to afford tanks, but not those with tiled/sloping roofs. The village committee decided to discourage families from drawing from the main supply by motor by imposing a stiff fine, however people mentioned that no one has yet been fined. Five to six families have their own bore wells.

The villagers are vigilant about the use and misuse of water. There was a proposal to install water meters in homes, but this did not work since the meters did not record consumption accurately, which gave rise to a lot of disputes within the village, and they were discontinued.

How the water supply system is operated

The village employs four operators, who have been trained in plumbing and given kits to undertake repairs. The village committee pays ₹1,000-1,500 each per month to the pump operators. The main water tank is on the land of the operator Lokranjan Mahanta, who manages the operations with support of his wife Sabita. He has donated the land to the village but has been residing in the rooms below the water tank. He has now built a house nearby. The main tank is filled twice each day. It takes up to four hours to fill; the tank is emptied in less than two hours, whereas earlier this took four to five hours, showing that the demand has increased. It used to take four hours to fill up

even earlier, which indicates that there is adequate water in the aquifer which has sustained over the years.

The depth of water in the aquifers is also high – villagers said that when they opened one bore to take out the pump for repairs the water level was less than 10 feet below ground level. The boring for a new pump (for Tank 4) was done to a depth of 300 feet, while the motor was installed at around 100 feet below ground level.

Toilets and bathing rooms for all households

In Angarpada and Polasara 265 families are currently dependent on the water supply system; the intervention began with 170 families in 1997. All have their own toilets and bathing rooms.

To construct the toilets and bathing rooms in 1997, the families received ₹2,500 from Gram Vikas in the form of materials – cement, steel, etc. BPL families got ₹500 from the government. In recent years, when families added new toilets, they received ₹12,000 from the government under the Swachch Bharat Mission. Repairs of some of the old toilets were also made with these funds. New families are given connections to the water supply systems once their toilets are built and they contribute ₹1,000 to the corpus fund. All the families in the village use toilets now, and there is no open defecation. Earlier they would have to give a warning if they defecated in the open, now they do not wish to defecate outside. Since water supply is regulated and not available at all times, families store water in their homes. Waste water in the bathing room is utilised to grow papayas, bananas and some vegetables.

While most families have twin leach pits, some families built only one soak pit. One woman said that when their soak pit was filled, they had to stop using the toilet for two to three months, which was very inconvenient. It is only when they could empty the soak pit, that they resumed use of the toilets.

When toilets were initially built, the village committee supported construction for poorer families by providing stone. Also, for two families which did not have land to build toilets, the villagers made the land available.

Dealing with leaks, breaks, or other disruption

During the process of construction, masons in the village were trained by Gram Vikas. In the last 25 years these masons have been able to take care of repairs and maintenance in the toilets and water supply system. They have also been able to construct new toilets in the village without outside support.

Last year, 14 families on one side of the village were receiving less water, due to their location. The village committee conducted a survey and addressed this by changing the delivery pipeline from Tank 1 to Tank 3. For this the village committee incurred a cost of ₹4,500 towards purchasing four pipes of 50 mm and hiring the bulldozer (JCB). The families bore the cost of labour for undertaking this work.

In another hamlet, reduced water supply was due to a crack caused by roots of trees, an issue it was not easy to detect. But once the problem was identified, the section of the pipe was repaired by the village committee.

The motor had to be repaired 10 years ago, and two more had to be repaired in 2019, for which the village committee bore the expenses.

In the case of defective taps or issues in the toilets, individual families have to undertake the repairs, supported by the VDC where necessary. But the failure to repair taps in time leads to a wastage of water, and the committee imposes a fine.

There have been instances of disruption in supply during a storm. The villagers remember cyclone Phailin in 2013. During that time, they managed with water from the two solar-pump Sintex tanks (2,000 litres each, one near the market and the other near the anganwadi), and the dug wells.

There are also concerns with electricity bills, which used to be billed monthly and were easy to clear. Now there is a tendency to send bills every 2-3 months, and the high cumulative amounts become harder to pay.

Ensuring good governance

After the old President Dilip Raut, a new president was selected but changed within a year. The current President Santosh Kumar Raut, who was formerly in the defence services, is the brother of Dilip Raut. The village committee was reconstituted in 2022 with 11 women and 10 men.

In addition to the village committee which oversees the water supply and sanitation, there is the Kali Puja Committee, where the President and Secretary have not changed for a long time. There are overlaps between the two committees. Every Puja a new operating committee is selected. Recently the Pani Panchayat received a sanction for 10 bore-wells to villagers, which is managed by a separate Pani Panchayat Samiti. There is also a Van Suraksha Samiti (Forest Protection Committee). As the forest mainly comprises acacia trees, there is limited revenue from it; people collect fuelwood from there and also ensure there is no indiscriminate logging.

The villagers remember the earlier President Khetramon Mahanta as being very supportive of the village. It also helped that the former Secretary of the village committee, Rabi Babu had retired as a PO from the panchayat, as he was able to identify water resources which could be tapped by the village.

The impacts as described by women

"It used to be difficult going out into the jungle under cover of darkness. Now we have our own toilets. No one likes to go out to defecate now." The women candidly spoke about how toilets and piped water supply have changed their lives, reduced their drudgery, freeing up time for them to care for their homes and children. They also feel that water-borne diseases have reduced.

Three self-help groups (SHGs) were formed in the early 2000s. They would meet regularly and talk about conditions in the village, and look into toilet usage and cleanliness. Now there are 25 groups,

set up under the Odisha Livelihoods Mission. The anganwadi did support the formation of the new groups; 11 women from these groups recently went to Balasore for training in tailoring.

One group also got the contract to construct 100 toilets, new ones and the repair of old ones, under the Swachch Bharat Mission. They bought material, engaged masons, and supervised the work. Families could add bathrooms as per their need and ability. Once the toilet was built, the family had to pay ₹1,000 to the corpus fund to be connected to the water supply system.

The women told us that there is a waste management system wherein all households follow a three-way segregation of waste – plastic bottles, polythene and glass bottles, with the waste being collected once a month. They proudly stated that no waste was thrown around in the village.

Earlier, women would undertake pisciculture collectively. The ponds are now auctioned by the panchayat. One SHG has taken the pond on lease, which is a Minor Irrigation Project auctioned by the Forest Department. One woman in an SHG cultivated mushrooms for a few years and made a profit, but now does not have time to continue. One of the SHGs has taken responsibility for collection of the electricity bills; two women from the group go around the panchayat to read the meters and make the collections.

Other spin-offs

During the implementation of Gram Vikas' programme, there was a joyful learning centre for younger children of 6 to 10 years. Given the interest shown by the village community, the village committee took an interest, converted an unused go-down and used the space to conduct classes. Students were enrolled to study up to class 5, and three teachers and one non-teaching staff were employed by the village committee. The village committee monitored the functioning of this centre, which has now grown into a formal school with classes to class 7 – the Nandikeshwar Shishu Vidya Mandir, also called the Aurobindo School. The school functions from fees paid by parents and has a management committee, but the village committee still has an active interest in it. Parents prefer to send their children here rather than the government school because of its holistic teaching and learning approach.

What lies ahead

The village is blessed with a rich aquifer system; the water level has not dropped much in the last few decades. The water quality is also said to be excellent and the water tastes very good. Thus the village is well placed for the future in terms of the sustainability of supply and water security.

The panchayat wants to take over operation and management of the water supply system, but people are not willing to let go. In two villages, the system has been handed over to the panchayat, which pays the operators' fees and the electricity bills. The village committees in these villages had become dysfunctional and stopped monthly collections from families. However, if there are any problems the repairs are not addressed in time. The operator fees are also not paid regularly there. Due to these reasons the residents of Angarpada fear that their well-functioning system may face a similar fate, so they do not want to hand over their water supply system to the panchayat, despite facing fairly high electricity bills.

An emerging challenge to the equitable distribution is the recent trend in some households' use of overhead plastic storage tanks combined with attaching motors to the water supply pipeline to draw water in.

The mega project of JJM is also at their doorstep. When asked if they will continue their community-managed water supply and sanitation system, the president said that they had had a dream of bringing tap water to each household, which they had realised over two decades ago, while the mega project is still a dream from the government and needs to be seen when it will be realised. The villagers emphatically state that even if the project comes to the village, "the water will not taste as sweet". This may be both literal and metaphorical – as more than one person had stated that the village is famous for the taste of its water.

Annexure 3.2.

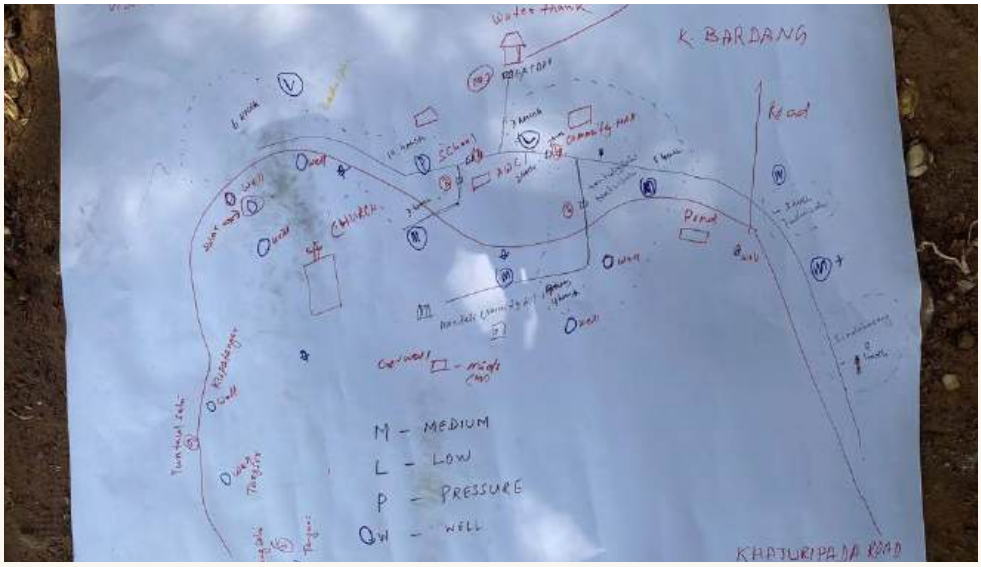
Anusahi Village, Khajuripada Panchayat, Nuagada Block, Gajapati District

DISTRICT
Gajapati

BLOCK
Nuagada

GRAM PANCHAYAT
Khajuripada

VILLAGE
Anusahi



Households at start of GV's work (1999)
50

Households at the time of survey (2018)
80

ST	SC	OBC	GEN
79	1	0	0

Water security and equity in a Soura village

Anusahi village is nestled in a horse-shoe shaped valley in the Eastern Ghats of Gajapati district. The village is supposed to have been settled by two brothers – one died, and the other had six sons (5 of whom survived), and their descendants are said to live in the village. The name Anu is said to derive from Hanu or Hanuman – as the area was well-populated with monkeys in the distant past, but is not reported anymore. The Anusahi residents are from the Soura tribal community. The total agricultural area was said to be around 100 acres, and the reserve forest and patta areas around 500 acres. The Titili cyclone hit the area, and while the residential areas were saved, a large number of trees on one side fell down.

Water situation before the GV intervention

Before the GV intervention, the primary sources of water in the village were 5-6 dug-wells, mostly community managed. The wells were spread out across the village in different hamlets. The few that we saw seemed to be around 30 feet deep. In addition, the community used to dig small chuas – shallow holes in moist areas around 4-5 feet deep – which have been filled up and not survived. There were a few hand-pumps as well.

Initial situation

A committee was set up by the village, to focus on water supply, and also asked to look at the construction of toilets and bathrooms. The first person to make a toilet and bathroom was Sandhu Mandal (then president, and still holding the post), the second was the treasurer, Masan Mandal. Subhan, the then secretary was amongst the last; his hamlet was at the tail end of the pipeline and he had doubts about whether the water would reach there: "I will not get water, so why should I be secretary." Interestingly, he also made his toilet and bathroom after the pipeline was laid and presumably reached his hamlet. Eso, from another tail-end hamlet came to donate labour (shramdan) but his hamlet did not get any water.

Kailash Chandra Sahu was the GV coordinator. In GV's initial visits to the village, there were reportedly apprehensions among the villagers about the motives of the NGO in coming to work in the village; this feeling dissipated as they realised that the focus was on water sanitation, and they began work. The water supply system was inaugurated by the then Chief Minister J.B. Patnaik.

Water sources

The village has extensive sources of water. The earliest sources were dug wells spread across the village. In addition, a spring or jharna in the hills above has been tapped for the piped water supply. The spring has good water quality – tests on 12 parameters show that the water is clear with no bacteria, both at the tank as well as in the sample houses where testing was done (and reported in resolution dated May 17, 2023).

Two tanks – second built after contamination

There were two tanks at the source: The first was built by GV support, to collect water and channel it to the pipeline. At that time there was no road (now, a road passes around 200 m from the source), and construction material had to be carried up to the site by shramdan.

Subsequently, about 4-5 years or so ago, a second tank was made, above and adjacent to the first, and the new tank collected the flow of water from the fissures in the rocks into the collection tank below. This was done apparently after a visit by GV staff including a foreign visitor, who conducted a water test and found some bacterial contamination, and on a second visit, recommended constructing a covering tank to prevent falling leaves, etc., to avoid bacterial contamination. The water system has not faced any contamination issues since.

Tank maintenance

A large mesh of fine roots was seen floating in the water in the second tank, near the outlet for the pipe. These plant roots grow in the tank, and eventually get into the outlet pipe and clog it. Hence the pipe/tank requires periodic cleaning, around 6-7 times a year. However, there is no impact of the roots on the quality of the water. There was damage to the lower tank on one side, which was plastered and repaired around four years ago.

Land-use above the source

The forest above the source had been cleared for cultivation (bagada/ slash-burn cultivation) in the past, prior to its use as a piped water source. Around three acres of forest above the water source belongs to the village mandali which has planted trees and plan to fence the area and plant more

trees. The trees planted are teak, cashew, and mango. The planting of trees has stopped further clearing of the land for shifting agriculture, and should lead to further regeneration in the forest, provided the undergrowth, etc., is not cleared.

Water availability across hamlets

A sketch map was prepared with the residents present in the meeting, to understand the water supply systems, hamlets served, locations of wells, etc., and any differences or concerns with water supply.

The purpose of getting residents to draw in elements related to the water supply on the map was to allow a discussion about specific elements and their interactions in a spatial way. The map shows the names of the hamlets, the presence of wells, and the sources – pipelines, tanks, and gate valves. In the discussion it emerged that there were some differences in the water pressure in different areas, even within hamlets (depicted by L – Low, M – Medium, M+ – Medium plus, and H – High). The status of water supply and the presence of wells in each hamlet is presented in the table below.

Hamlet	Status of piped water supply and alternate sources	Number of wells / well locations
Bardeng Sahi	No piped water supply; they use the Kupatangar well in Tuntaul Sahi.	2 wells at Tangari & Tangsir
Tuntaul Sahi	The well is the primary source; as it is not connected to the water supply system the village does not have piped supply.	1 at Kupatangar
Bada Sahi	Bada Sahi is the main hamlet; the upper portions receive less water due to low pressure; the lower parts are well served with medium and even high pressure.	Patikada (two wells side-by- side) 1 well School well
Titin Sahi	The hamlet is also called Tentuli Sahi, which means tamarind (imli); the upper region has low pressure and receives less water.	2 wells
Pudui Sahi	It has medium-pressure supply.	1 well
Sindiba Sahi	The name means a small khajur tree, but this is hardly seen any more. It receives medium-plus pressure, as it is at the tail end, about 1.5 km away. The first secretary of the committee, who was from this hamlet, was instrumental in getting the water supply pipeline extended to it.	1 well (tbc)

The village has only two motors, in the anaganwadi and the dug-well.

Operations and water supply – from 24-hours to 'timing' (gote ghanta)

Water is supplied to connected households, the village mandali community hall, and its toilet. Initially around 50 households received water; subsequently this has been extended to another 20 or so households. The church is not connected, presumably as there is no toilet there. For about 8-9 months in a year, the main gate valve is left open for 24 hours as there is adequate flow of water from the water source. By the end of March or early April till around the end of June, the source starts drying up and the water supply shifts to 'timing' (gote ghanta) – one hour a day in the evening.

People said that water supply in summer was always restricted to 'timing'. However one person said that in the initial years water was supplied all the time, all year around, but after about five years, they shifted to 'timing'. This may have been around the time that 20-odd households were added to the water supply system, after they built toilets with aid from the SBM, and demand increased.

Water supply gate valve operations

The gate valve is operated by the operator, Enosh Mandal, who opens the valve at around 6 pm for one hour in summer. At least two people said that only the operator is allowed to change the setting of the gate valve, and that if Enosh is not there the system would shut down.

Sometimes people complain that to Enosh that they are not receiving sufficient water, and that he should see to this. The post of the operator is a fixed and honorary one; Enosh has been handling the work for many years. There is a proposal to offer some support to him, as per the 'khushi' of the village, but this has not happened yet.

How long does the storage tank take to fill across seasons?

For about six months (July to December), there is more than sufficient water flowing into the tank. Water supply is continuous, and despite usage the tank keeps overflowing. For January and February, supply is still continuous, but the tank does not overflow in the day, only at night when usage falls. By April, the tank fills up to only around 8 of its total depth of 10 feet, while by May-June, it fills up to around 5 or 6 feet. Initially committee members used to handle the gate valve. Then Enosh was given sole charge of the work, which is more in the summer months (as he has to open and close the valve daily), and less in the monsoon and post-monsoon seasons.

Differential levels of water supply – role of gate valves in enhancing equity in water supply

On the map, the different hamlets were depicted along with the approximate number of households in each. Two hamlets are on the upper side and therefore have a bit less pressure. To moderate the water supply to all areas, four additional gate valves were installed 5-8 years ago, which are kept partially open during summer thereby reducing the flow through the values to the downstream hamlets, and allowing adequate pressure and volume of water to flow to the two upper hamlets, in Bada Sahi and Titin Sahi (6 households to the upper left of Bada Sahi). This setting is done once at the beginning of the season.

Gate valves 1 and 2 are kept open fully, and gate valves 3, 4, and 5 are kept half-open, so that water flows to the upper-side houses. This suggestion was apparently made in a discussion with Jai

Krishan Das, who is a long-standing GV staff member involved in the village, who asked them to fix additional gate valves, which were purchased from Behrampur.

Repairs

These are typically handled on a case-by-case basis. The committee members said they collect money only when required to deal with an emergent repair situation; they can also take support from the Mandali.

In the past, they have managed to get resources from the panchayat as well, for the repair of source tanks (leakages and re-plastering from inside and out). Details of the cost of repairs for the tank were available, and the resolution authorising the repairs was seen in the proceedings book. Repairs were authorised in the last week of May 2018, and done in the first week of June, 2018.

Around 4-5 people in the village reportedly know about fitting pipes and plumbing, and can help fix these in the village.

Committee documents

We were able to see a proceedings register for the last 5-odd years. There were few meetings about operations and repair issues, especially for the repair of the source tank in 2018, mentioned above. The person who had the other documents was not available in the village that day.

Tank cleaning

Tanks were cleaned about 2-3 times a year. It was stated that cleaning was last done around November 2022, and prior to that, had been done before the start of the 2022 monsoon, in around June 2022. To undertake cleaning and other works, the village has an interesting system: an announcement is made over a public address loudspeaker system via a microphone the evening before regarding the cleaning the next day, and people showed up to help.

Water testing

Testing was done at 5-6 points on May 17, 2023, and the results entered in the meeting register (see the Resolutions annex). The water was tested at the supply tank, the dug well (with the solar-powered pump which is not in use), and in a few households. A map prepared to locate the water testing points was included in the committee records.

Left-out hamlets

Tuntaul Sahi and Bardeng Sahi, two hamlets on one side of the village, are almost a km away from the tank, and these did not receive piped water supply (see map). One resident, Eso Mandal, from Tuntaul Sahi hamlet came for the meeting, stating he was the only person from his hamlet to make a toilet and bathroom; the other nine-odd families were not ready for various reasons: they had been using a dug-well for a long time; did not like the idea of making a toilet and bathroom and sitting in a room to defecate, and also felt they are so far from the proposed tank they doubted pipes would actually be laid so that water would reach them.

The almost left-out hamlets

Sindiba Sahi (Sindiba refers to a kind of a small khajur tree hardly seen any more) receives fairly good water supply with medium-plus availability. The hamlet is at the tail end, about 1 km away from the storage tank, and additional lengths of pipe were required to connect it, for which the GV person in charge of the initial project had to get a second estimate passed of around 3,000 feet of pipeline. (In the first estimate of about 10,000 feet of pipe, this hamlet was reportedly not covered.) Subhan Mandal, first secretary of the committee who was from this hamlet, said that he had to ask GV to include his hamlet, or he would have to leave the committee: "pani nahi jayega to chordega, ayega to karega."

Discussion with women around the well in Bada Sahi

The women's house is at a higher elevation and gets less water in summer, so they keep 2-3 handis of water from the pipeline for drinking. The remaining supply is stored in drums or buckets for washing and use in the toilet, and is supplemented with water from the well in summer.

Solar panels for the well at Patikada for supplementary supply

An additional source of water was explored by GV a few years ago. A solar panel-based pump was placed adjacent to a large well, and a pipeline extended from the well to the storage tank. However the well is not used to supplement water in the piped water system, because the water in the solar well has a brownish tinge and is said to not taste good. Initial water testing has not revealed any significant red flags.

Washing of clothes, and so on, happens around a smaller second well that is adjacent to the solar well. The staff speculated whether that could impact the water quality in the bigger well, which has greenish water, of good quality; this second well was repaired with funds from the Jeevan Dhara programme.

Collection of funds

The committee tried to collect ₹10 per household per month in June 2022, from about 70 households, but only about a quarter paid (not sure for how long). However, repairs have been carried out by generating resources at the community level. To replace the gate valve, etc., (at a cost of around ₹3,000 for a 90-mm one and around ₹2,500 for the 75-mm one), around ₹300-400 was collected last year from each household. The fitting was done by Subhan, the former secretary, and labour was provided voluntarily by the village residents. A balance of around ₹1,000-1,200 still remains from the collection.

New households

The sarpanch listed about 15-20 households for which water supply has been extended after the water supply scheme was set up.

Sanitation

People built twin-pit toilets; some have filled one pit and some have filled two and returned to the first one.

Support from the panchayat

Given that the president of the water committee is also the sarpanch of the Khujarapada panchayat, coordination with the panchayat is fairly easy. It was reported that a 2 lakh was allocated from the panchayat this year for extending water supply to the left-out hamlets. The president/sarpanch said that water supply would be extended to these households and the toilet and bathroom can be built later when they receive the subsidy.

In terms of further expectations from the panchayat: a well with hand pump and submersible pump in front of the anganwadi needs to be cleaned and repaired; the non-functioning hand pump has to be restored/repaired, for which they have applied to the panchayat for funds. The school has two more hand pumps which are said to be functional.

They have also asked the panchayat to help clean/restore the dug-well adjacent to the solar well as they are concerned that wastewater from use adjacent to the well may be seeping into the solar-enabled well and impacting its colour/taste and, possibly, quality.

Engagement with RWSS

The village has received support for various activities from the RWSS which:

- Gave funds for repairing the dug well, with solar panels, with tech support from GV;
- Supplied the black pipe two years ago to connect this well to the water tank; it is not yet in use due to taste issues; and
- installed hand-pumps and gave a grant of ₹1 lakh for repairing the main water tank.

It was said that VDC members approach the RWSS directly for any requirements: "If required, Dash babu (from GV) can make a call."

Other institutions and cooperations

- **Church construction.** The church was built with donations from the village, collected every Sunday, and given willingly by the people. Of this, around ₹55-60 lakh has been spent. The labour was provided free by the villagers, and the mistris (masons) from the village reportedly also volunteered their time. The church was inaugurated in 2016.
- **Community hall.** For construction of the community hall the village received ₹5 lakh initially from the panchayat, then ₹2 lakh for building an extension room, and subsequently ₹1 lakh for the flooring. All the construction work is handled by the village Mandali.
- **Labour contribution for the community hall.** The village has a system for generating labour contributions from the community. They have created six groups comprising around 10 households each. Each group works one day a week; they are currently working on building the community hall. We met one such group of volunteers on our visit.
- **SHGs.** There are reportedly nine SHGs in the village which collect ₹50/month/person as savings. There is also a Vana Suraksha Samiti (VSS) in the village, which mentioned that their work mainly involved helping apply for pattas for individual forest rights and tree planting, etc.

The main festival celebrated in the village is Christmas. The village has reportedly been given drums and other instruments by the government to celebrate local festivals, but these do not seem to be in use.

Impact and influence

Anusahi was the first village in the area to get water supply and that-too gravity flow. Sandhu Mandal, the second president, helped motivate villagers to take up construction of toilets and bathrooms; subsequently he helped motivate six other villages to do the same. After hearing about and visiting the system in Anusahi or talking to their residents, the following villages were said to have also built water supply systems and toilets and bathrooms:

Sindrampur village in Samphalpur Panchayat, Rupurising village in Antarada Panchayat, Kudusahi, Tarangada and Murising villages in Khajuripada Panchayat, Kerugeising village in Nuagada Panchayat, and Nbardanya village in Parimala Panchayat.

In discussion, GV field staff said that once people from other villages saw the system in Anusahi – this gave them an example and a tangible model for the way forward – that GV could help them build a similar system– and this made the work of extending the work easier for the staff.

Annexure 3.3.

Bandipahad Sadakpada Village, Lakhanpur Panchayat and Block, Jharsuguda District

DISTRICT
Jharsuguda

BLOCK
Lakhanpur

GRAM PANCHAYAT
Lakhanpur

VILLAGE
Bandipahad Sadakpada

Households at start of GV's work (2012)
87

Households at the time of survey (2018)
104

ST	SC	OBC	GEN
87	0	16	1

At a time of crisis, women take the lead

Bandipahad Sadakpada is a village in Lakhanpur Panchayat of Jharsuguda, with a predominantly tribal population.

A community-managed water supply and sanitation programme has been implemented with support from Gram Vikas in all the villages in Lakhanpur Panchayat, which is in close proximity to the Mahanadi Coalfields.

Before they received piped water supply in the village, the residents depended on a well and standpoints, at which water would be supplied by the panchayat. They used to fetch water and store it in their homes, but the water was insufficient in the summer months.

Gram Vikas first came to the village in 2012, and work on toilets, bathing rooms and water supply was completed in 2015. A committee was set up to manage the water supply system – and it is registered as the Gramya Jalo-o-Parimala Committee, RWSS, Bandipahad.

Building toilets

To build the toilets, every family had to collect stones for the foundations and provide labour. Gram Vikas gave up to ₹5,000 per household in the form of material such as cement and rods, and masonry support. Other materials were mobilised by the families themselves. There were 87 households at the start, and now there are nearly 150 households.

Some new households have built toilets, others have not, since they do not have the funds, but they use the toilets in their parents' homes. They have been given water supply connections but have not contributed to the corpus fund.

Water supply system

For the water supply, all adults in the village contributed five person- days of work. A bore-well was dug, water was obtained at 150 ft, and an overhead water tank of 10,000 litres capacity was built. The land for the tank was donated by a village resident in 2014 (as recorded in the resolutions). Initially the villagers received water all through the day. With reducing water availability in the aquifer, at present they release water twice a day. The pump is run for several hours each time, but the tank still does not get filled fully, and distribution is started with a partially filled tank.

Shocks to the system

The water supply system has gone through a range of problems including motor breakdown, necessitating frequent and expensive repairs and replacements in the system. There have also been high electricity bills and resultant non-payments. Because of this water supply was disrupted in the past year. Five women in the village decided to take charge and now have made a plan for regular collections, maintenance and operation of the water supply system, timely payments of electricity bills, etc. The village committee was reconstituted this year (on December 12, 2022) with 11 members, and the women are playing a leadership role.

Costs of the water supply system

Two women from the committee currently operate the motor to run the water supply system on a voluntary basis. Earlier the water tank operator was being paid ₹1,000 per month. To meet the electricity bills and other expenses, the village committee collects ₹20 per head per month; thus a family of five pays ₹100 a month for water. A cashier is appointed to collect the money door-to-door from all the hamlets, and it takes him two to three days to make the collections. If a household does not pay on time it is given a week's notice, which has now been relaxed to a month's notice. In the past, water supply was cut from two households due to non-payment. As the residents had pooled money to buy a motor recently, they are not collecting ₹20 a month at present, but they plan to start collections soon.

Motor troubles and responses

The pump motor has needed to be repaired or replaced at least five times in the past, most recently in December 2022. The five women who manage the system pooled ₹4,000 each to buy a new motor for ₹20,000, as an interim measure so that water supply was not disrupted for too long. This amount was subsequently recouped through contributions of ₹200 per household. However, this motor stopped functioning within a few months, and the villagers did not have water for almost three months. They then made an application to the panchayat and received a new motor after about three months, in May 2023. They gave one of their older non-functional motors

in exchange. To install the new motor, the entire village came together and provided labour. The motor that they had earlier purchased has been repaired and kept as a standby.
As per the cashbook, expenses were also made for a new gate valve in 2016, and for transformer repairs in 2017 and 2018.

Regularising payment of electricity bills

The five women who have taken leadership roles in the new committee have taken responsibility for the timely payment of electricity bills. To cover the dues of ₹3 lakh, which had resulted in cutting the electricity connection for the water supply, they went to meet officials of the electricity department in Belpahad, which is a 15-minute bus ride from their village. They have an assurance that each month they will pay their electricity bill for the month, along with some amount of the arrears, so that their over dues are paid off in course of time. Based on this, electricity supply to the village was reconnected. Now the bill shows only the last month's usage as

Income	Rs
Grant received from Western Odisha Development	349,000
Corporation (WODC) against TBR construction work	400,200
Grant received against NBA Subsidy from DWSM towards TBR construction work (87 hhs x ₹4,600)	326,250
Grant received from TLR Krosaki - Belapahad towards TBR construction work (87 hhs x ₹3,750)	1,616,400
Grant received from Gram Vikas C/O DWSM against water tank/supply construction work Maintenance fund collection by VDC	354,040

Expenditure	Rs
Construction of Toilet & bathing room work expenditure by GV/VDC	988,450
Water tank/supply construction expenses by Gram Vikas through VDC	1,616,400
Electricity bill payment for water supply work against maintenance fund	76,500
Repairing of main pipe line for water supply work expenses by VDC	40,000
Repairing of pump-set & motor for water supply work expenses by VDC	60,992
Repairing electricity transformer of pump house for water supply expenses by VDC	53,248
Water tank washing and boundary wall cleaning expenses by VDC	30,000
Pump operator charges for maintenance of water supply & pump house work expenses by VDC	72,000
Other expenses by VDC- stationary, travel, food, etc.	11,300
Water tank inauguration expenses by VDC	10,000

the current amount payable, while the long-term pending amount is shown separately as pending arrears. The women have collected ₹300 from each household towards meeting the electricity supply (which has been recorded in the resolutions).

In 2022 their accounts were audited with help from a Village Lekha Mitra.

Water quantity and quality: The village faces a declining water availability in their aquifer, and cannot fill the tank completely even after running the motor for many hours, especially in summer. In addition, the water is red in colour from its high mineral content, and buckets get coated red after water is kept standing in them. The villagers also feel that the iron in the water jams the motor, so they ensure that the tank is cleaned every month. When it is cleaned there is a red deposit in the tank. Earlier they used to pay ₹1,000 and sometimes up to ₹2,500 for cleaning the water tank, now they give the young man who cleans the tank some snacks and drinks in lieu of payment. Tests for water quality show that there are no serious problems in the water.

Toilet usage: Despite the water shortages, toilets are reportedly used regularly, even if they have to carry water for use in the toilets.

Water security: The community also came together to prepare a Village Poverty Reduction Plan. Water scarcity and the need for water security were their top priorities. One of the activities they are undertaking for this is the development of a three-acre pond (pokhri) with support from Gram Vikas and the panchayat. The land is owned privately, but the owner has handed it over to the village. In addition to Gram Vikas' funds, MGNREGA funds have also been leveraged. The work was underway in June and the villagers hoped to complete it before the start of the monsoons.

Community activities: There are buildings of Mission Shakti and Van Suraksha Samiti in the village. The 12 SHGs are active and collect savings each month. One group is making sal-leaf plates and another group is making jhadoos (brooms). The VSS periodically engages the community in nursery plantations. Villagers protect the forest and ensure there is no misuse; and all families can collect fuelwood and forest produce. The most significant community event is an annual festival in a cave in the hill above the village. The cave is said to have been used by the Pandavas. Each year during Kartik Purnima (full moon), pilgrims from near and far come to the cave. Women from Bandipahad Sadakpada take charge and organise the event.

Bandipahad Dumripada – water woes

An adjoining hamlet of 20 households was also supposed to be connected to the water supply system, but given its location, distance and the capacity of the water tank, this was not feasible and they faced problems in their water supply. The panchayat dug a separate bore-well and gave a 5,000-litre sintex tank to the hamlet. Given the low water availability in the bore-well they stopped running it; at present it is disconnected and kept in one of the houses of the villagers. There is a separate operator and collection mechanism for this habitation and they collect ₹10 monthly from each household. For common activities, Bandipahad Sadakpada and Dumripada work together. They have all built toilets and bathing rooms which are being used.

A tanker from the panchayat brings water from a private bore-well to the habitation two to three days every week. This they store and use, apart from using the hand-pump in the village, which has a low discharge – the water flow stops after two-three people use it. There is also a pond about a kilometre away which they use for bathing. Residents said that this level of water shortage has been faced only this year, ascribing it to the impact of mining activity in the area, combined with low rainfall. They are hoping for an early resolution to their problems soon.

Annexure 3.4.

Beherguda Village, Lakhanpur Panchayat and Block, Jharsuguda District

DISTRICT
Jharsuguda

BLOCK
Lakhanpur

GRAM PANCHAYAT
Lakhanpur

VILLAGE
Beheraguda

Households at start of GV's work (2010)
41

Households at the time of survey (2018)
43

ST	SC	OBC	GEN
12	1	20	6

To keep a self-managed system going, despite the shocks

The villages of Lakhanpur Panchayat in Jharsuguda District are in the periphery of the Mahanadi Coalfields. Karlajori village in the panchayat has recently been relocated with the expansion of the coal mine. All other villages which sit on sheets of coal, await the same fate, it could be in the next few decades, or it could be sooner. The area is also surrounded by stretches of mixed forest, which yield a range of produce. Beheraguda village is located close to the highway.

What the villagers shared

The meeting on the evening of June 6 was attended by many villagers, including ward member Sumidha Tandi, Secretary Jasmin Bhoi, Vice President Jugal Kalo, many members of old and new committees, and women from the self-help groups (SHGs). The water supply and sanitation system has been operational in the village since 2011. Till recently the water supply system had functioned well, but there has been a disruption since February 2023; the problems had started much earlier and had been building up.

They had seen the work that communities had done in neighbouring villages with support from Gram Vikas in building piped water supply systems and sanitation, and wanted to have a similar system. Among the initial group of leaders were teachers, who were keen to implement the programme in their village. They went to Daridhipa village to see the work there and how the community managed it. Jugal Kalo, a retired teacher shared that, with only 41 families in their village, Gram Vikas was initially reluctant to work there. Finally with persuasion and support from the panchayat, work was started. The Sarpanch of Lakhanpur Panchayat gave the assurance that the entire panchayat would be covered.

Coming together and pooling resources for construction

After the villagers arrived at a consensus, construction of the toilets and bathing rooms started in February 2010. The MLA Anil Sahu contributed ₹1,50,000 to support the construction of toilets and Tata Refractory Limited, Belpahad, provided 1,500 bricks per family for the same. In addition, all families who were BPL (which was most of the households) received ₹4,600 each from the government under the Nirmal Bharat Abhiyan.

Since there was a lot of enthusiasm among the villagers, and the women were especially keen to get piped water supply, the work was done very quickly in less than a year. There was one widow in the village whose sons had a dispute over land: one son, Rajkumar Kisan, was the president of the village committee. When both sons delayed the construction process, the woman, who was almost 60, took charge and started digging for the toilet and bathing room, and ensured that it was built. Her efforts were recognised and she was felicitated.

Corpus collection

Going beyond the ₹1,000 per household norm suggested by Gram Vikas, 41 households collected a corpus of ₹50,000, saying it would come in use in the future. The villagers have a practice of working together. Each year they collectively work for community festivals, with recent contributions being in the range of ₹400-500 per household. Women have come together to form SHGs, but these are largely restricted to monthly savings and credit, though they are keen to begin some collective activity.

Water availability and the water supply system

Before the establishment of the piped water supply system, the villagers depended on a stream (nala) nearby for bathing and on hand pumps for drinking water. Though the quantity of water in the stream has reduced over time, it still has some water.

When plans for the water supply were being made, one bore-well was identified and dug initially, and this was followed by two more bore-wells dug with support from RWSS.

For the piped water supply system, funds were leveraged from RWSS. Rosters were made for labour contributions from all families for construction of the system.

A 30,000-litre overhead water tank was built, the water supply system was established and by December 2011 piped water started being supplied to all the households. The villagers would get water supply all the time, and said that the water from the tank tasted good, and could be used for

drinking and cooking. From the beginning 3-5 houses did not get adequate water because they were at a higher level. This has not yet been adequately addressed.

Alternative water sources and water quality

There are nearly 30 dug-wells across the village, many in individual homes, and their water levels fall in summer. Since the village is located in the coal belt, the quality of water in the dug-wells is poor, reddish in colour and clears only when it is allowed to settle.

Some years ago while MCL was drilling for coal, a geyser of hot water gushed from a depth of 1,100 ft. Once the geyser settled, the government constructed a water tank and water stored in the tank was supplied to all the villages in the panchayat through stand-posts.

Extending piped water facility

When new households needed water supply, they would make their own arrangements for pipes, labour, etc. In April 2017, one household built a toilet at their own costs, and subsequently they were given water connections. However, this practice has not continued. Over time, as many more households have come up in the village, they have not been connected to the piped water supply as they have not built toilets. They have not been covered under the Swachch Bharat Abhiyan for new toilet construction.

Water charges and management systems

To meet electricity expenses and other recurring costs, initially there was a monthly collection of ₹15 per person; so a four-member family paid ₹60. The committee members divided the village into localities to collect these fees. When one family did not pay even after repeated reminders, water supply to their household was finally disconnected through a consensus decision in the village. Over time the village has made efforts to streamline collections on fixed days, and have also decided to charge families ₹100 per household for the use of water during marriages and festivals; other community functions are also charged for the use of water.

Addressing rising electricity bills

On receiving their first few electricity bills the villagers realised they needed to take action, so in June 2012, they discussed in the village meeting how to reduce the bills. The bill for February 2012 was ₹1,308. Collections to pay the electricity bills were usually made as and when the bills were received. In 2017, they decided to collect ₹300-500 per household to meet these bills. However, there were defaults, and by October 2020 the arrears had amounted to around ₹67,073; this increased substantially, and by November 2022, the monthly bill amount was ₹1,665, and arrears had amounted to ₹102,720. The department demanded that the villagers pay at least half their dues. This is an issue which affects most of the villages in the panchayat as well.

Since the electricity bill and arrears have not been paid, water supply to Beheraguda was cut in February 2023.

They now have to resort to the stream for bathing and to hand pump and stand-posts for other water uses. "Se hampump paani bholo nahi, osubidha ochchi... tanki re chobbis ghanta sufficient paani thila - rati re bhi ghir-ghir-ghir-ghir paani" ("the hand-pump water is not good - we face a problem

- earlier we got sufficient water from the tank, continuous water even at night"). They say they continue to use the toilets as it has now become a habit.

In April 2020, problems in the main pipeline were repaired by the villagers. Around 8-10 people now know plumbing in the village and can undertake repairs. They learnt to do this while work was going on in their village. The tank is cleaned a few times every year by the villagers for which there was a rotational system among the households.

Motor operations, maintenance and related costs

In 2013, when the motor developed problems, the villagers repaired it. In April 2015 they had to get a new motor, the first replacement after four years. The funds for this were collected through contributions from the village community. The new motor worked for a while. Since then the government has given the villages two motors, but both have stopped functioning in one and half years.

In 2022, the functioning motor developed problems; the village spent ₹8,000 on a second-hand motor which also did not work. Once more they collected money from all the villagers, after which people stopped paying or collecting monthly fees. They say that the iron deposits jam the motor and spoils it; also the motor is affected by voltage fluctuations and lightning. The village does not have a functional motor at present.

Udhav Sahu is the pump operator, and has run the motor from the start. Initially, he was not paid, but in 2012, the villagers decided to pay him ₹200 a month with a collection of ₹5 per household. The tank is on his land, he lives there and his family uses the room below the tank, which has become a matter of dispute. There is a clause in his agreement which says that on his death someone from his family would take responsibility for operating the water supply system. The operator's son-in-law said that there are continuous problems with the electricity, motor, starter, wire, etc.

The Village Committee and its motivations

There used to be no specific date for the village committee meetings, they met as and when required. They met more frequently initially when construction was ongoing. Over time they have tried to regularise meetings and collections.

The village recently appointed a Village Lekha Mitra with Gram Vikas' help to audit their accounts. They still have their corpus, the ₹50,000 they had collected in 2011 has grown in a fixed deposit. There is a newly constituted village committee, with the older leadership keen on handing over charge. A group of volunteers have now been organised to regularise electricity connections. The ward member, Sumidha Tandi, who is from the village is keen to get the water supply system operational, as are the women from the SHGs who attended the meeting. The water from the tank is better they say, and they would like it to work again.

Annexure 3.5.

Dengapadar Village, Nandiagada Panchayat, Kabisuryanagar Block, Ganjam District

DISTRICT
Ganjam

BLOCK
Kabisuryanagar

GRAM PANCHAYAT
Nandiagada

Households at start of GV's work (1994)
236

Households at the time of SAS survey (2018)
329

ST	SC	OBC	GEN
0	43	269	7

Continuing the legacy of community cooperation

Dengapadar is a large village in Nandiagada Panchayat. It is in Hinjilicut constituency, represented by Odisha's current Chief Minister, Shri Naveen Patnaik, who visited the village in 1998, when he was Member of Parliament and Union Minister of Steel and Mines. The current Member of Parliament, Smt Pramila Bisoyi is from village Chermaria, which like Dengapadar was among the early villages to undertake decentralised, community-managed, piped water supply and sanitation in partnership with Gram Vikas.

Located adjacent to a 15-acre fresh-water pond, the village finds itself situated on a rock bed with shallow aquifers. Bore-wells do not yield water, dug-wells are the only source. Rock is hit at 30 feet, and continues till over 200 feet. This has made the villagers cautious about how water is used.

The village had a practice of working together, especially in the management of the pond, from which they earned an annual income and organised an annual religious festival. Most families in the village are marginal farmers, but are progressive and have gone on to become teachers, and taken other government and private jobs. Many youths migrate for work, and at present in every household at least two persons work in Chennai, Surat, or Hyderabad.

Community cohesion and leadership

Gram Vikas first visited the village in the course of implementing the biogas programme in the 1980s. A few biogas plants continued to be operational till a few years ago, for almost 30 years, with minor repairs. With the division of families and reduction of cattle, the biogas plants went into disuse.

Prior to implementation of the water supply intervention, the failure of government-supplied tube-wells resulted in acute water scarcity, especially in summer. The pond was the only source for bathing, drinking, and all the livestock and household use. The absence of protected drinking water resulted in recurring incidents of diarrhoea, gastro-enteritis, etc., which had made the villagers desperate for clean sources of water.

They went to the District Collector who asked them to visit Sarakumpa and Samiapalli where Gram Vikas had initiated the water supply and sanitation programme. They visited, stayed overnight and wrote a survey report. There they saw how the entire village found ways to work together, especially in supporting families which did not have enough money or material for construction. There were cases where a few families did not have land to build their toilet, and the village found ways to make the land available to them. These instances inspired them to undertake a similar programme in their village and they approached Gram Vikas.

A few people from Gram Vikas visited the village in 1994, to discuss the modalities of the programme with the village leaders and others in the community. An old and respected village leader, Laba Biswal, listened intently to the proposal, to what Gram Vikas promised to bring, and what they expected villagers to do. Along with a few others in the village, he encouraged the villagers to take the challenge and participate in the programme. Some of them were suspicious, and concerned about why Gram Vikas would want to provide support to the village and the families to build toilets and piped water supply. And then there was the question of each family contributing to a community corpus fund, which was to be used to support new families in the village in the future. The corpus fund would be jointly managed by the village committee and Gram Vikas. "Will Gram Vikas take away our assets? Will our village be sold?" These were the questions the villagers asked.

Today the villagers say "a lot of money has been spent in our village in the name of different schemes and programmes, but none of them have lasted the way the water supply and sanitation programme has. Even now we get water on tap all through the day in our homes."

Generating a corpus fund

When the issue of collecting a corpus fund was discussed, the villagers wondered how each family would be able to contribute ₹1,000. After much debate and discussion, they decided that each family would contribute ₹500 to the corpus, and the balance would be paid out of the common fund of the village. The village common fund had a sizable amount of money from the income generated by the annual fish harvest from the 15-acre community pond. Fish are a rich source of income, bringing in nearly ₹80,000-100,000 every year in the 1990s. What was significant about this decision was the fact that the fund had till then been used for a jatra (a community festival) each year, in the month of July. Whatever remained was used for building and renovating the

village temples. The villagers collectively decided that sanitation infrastructure and access to safe drinking water should get preference, and the jatra was discontinued for three years. Each time the fish was harvested, every household would get 1 kg of fish free of cost, while the remainder of the catch was sold, and the proceeds deposited in the community fund. In this manner a sum of ₹2,36,000 was generated for the corpus fund.

Village Committee

The community has registered a society, Bishwanath Gramya Unnayan Samiti, which is used for the collection of funds, and is the decision-making body. During the initial days of the programme, there were village-level and hamlet-wise meetings almost every evening. They now meet once every month. Monthly collections and accounts are well maintained and recorded and significant resolutions are discussed in the meetings. The people in the committee have changed; some of the older people have died. Laba Biswal's sons, grandsons, and grandnephews continue to play a leadership role in the village. At present there are no administrative positions, instead, everybody is equally part of the committee and the decisions are collectively made.

Given the vast funds of the village, and because they did not have proper audits, there were issues related to audit and income tax some years ago. After this they decided not to keep a large corpus fund in their account. Instead, they now have ₹20 lakh in 10 fixed deposits of ₹2 lakh each, in the names of individuals who have given a written undertaking that the fund is to be used solely for village development, based on the decisions of the village committee, and will not be put to personal use.

Other community investments

From the community fund, the villagers also paid a portion of people's contributions towards the construction of the water tank. The electrical transformer in their village also needed upgrading, and they spent nearly ₹40,000 on procuring a new one and on additional electric wires and poles. In 2000, they built a community hall on a 100 sq. m. plinth area, for which Gram Vikas contributed ₹40,000, ₹80,000 was drawn from the community fund, and villagers voluntarily provided labour. At the time, the village committee additionally decided to deposit ₹60,000 from the community fund in a fixed deposit, of which neither the principal nor interest would be touched for five years. This was to ensure a backup fund to meet unforeseen contingencies, such as technical faults, repairs, and replacement in the water supply systems, etc.

In 2001, they used part of the community fund to buy a standby generator to ensure power supply for pumping water in case of disruptions. At the time, they had got some money from the panchayat for cleaning the pond. The villagers contributed labour, and the ₹1 lakh that was earned, was used to purchase the generator rather than paying it out for labour.

To economise on the use of the generator, the villagers have laid a pipeline which connects to 20 stand-posts. The main water supply pipe is not used when the generator is operated to pump water. This backup has served them well during power disruptions following storms and cyclones. After cyclone Phailin, the Block Development Officer approached the village and purchased water, for ₹10,000.

Construction of toilets, bathing rooms (TBRs) and extension of facilities

For the construction of TBRs, stones and labour were provided by the village community. Gram Vikas also provided training for masons. The construction work started in December 1994 and was completed by May 1997. To accelerate the construction, they set a completion date for the foundation-digging and stone-binding. If families did not construct within the time period set, they would not receive any bricks for construction.

Between 1997 and 2000, 16 more households were added in the village. As per the agreed norms, the community drew upon the interest from the corpus fund to extend the sanitation and water programme to the new habitations. The village committee decided that they would not touch either the principal or interest from the corpus, instead, ₹1,300 would be given to each new household out of the community fund, and the balance would be given by the individual ousehold involved.

In subsequent years new families in the village have built toilets, either from their own finances or with government support if available. Only after they build their toilets is the piped water connection extended to the new households. At the same time they have to contribute ₹1,000 to the corpus fund. The current number of households is 382.

The toilets were constructed with two soak pits each. Over time, in a few households the soak pits have filled up. Since it was a twin-pit system, this has not disrupted the use of toilets; the filled pits have been cleaned and are ready for the next cycle of use.

Water supply sources

The village has three water tanks. The main tank is of 75,000 litres capacity, while the second tank is of 38,000 litres. A third tank of 50,000 litres has been constructed, for use occasionally in an emergency or during festivals, or in times when more water is needed in the village.

There are two water sources (dug well) for the tanks, both developed in 1997. The other water sources in the village are 8 hand-pumps and 20 dug-wells. People from neighbouring villages also come at times of shortage to collect water.

The main water tank needed to be repaired some years ago, since it had developed cracks and leaks after 20 years of being in use. For this, the village was able to leverage ₹3,00,000 from the Block Office. The committee members monitored the repairs and also created a system for labour contributions.

Water supply system/water supply charges

There are two pumps connected to the two dug wells which run on electricity. Water is released twice during the day by the pump operator. All families get water in their homes through pipes throughout the day. In the summer months, if there is a shortage, they disconnect the delivery through the main pipeline, and use the pipeline connected to the generator which supplies water to the stand posts. Any family needing water can collect water from the stand posts at this time. The pump operator has been changed only once in the last 30 years. The operators have been trained by the plumbers and technicians from Gram Vikas. The operators take care of the

maintenance of the motors. The motor runs for more than 16 hours every day. Periodically, the motor has needed repairs; the villagers have kept six motors on standby, so that water supply is not disrupted even for a day.

Equity issues - how households cope

There are differences in water pressure as it flows from the tank, which leads to differences in supply to different parts of the village. For around ten days from June 14 to 23, the dug wells had insufficient water, and water was supplied through the stand-posts to regulate use. We spoke with different households to understand how they cope.

The harijan sahi, which is located at a distance from the main tank, receives less water, due to low water pressure. The sahi has a water standpoint connected to the main tank and a hand pump at the rear which is not working at present. There is a pond where many go to bathe. The women remarked that there has always been a problem with water availability, but it has become worse during the peak summers. The standpoint is the sole source of drinking water at present. Daily trips to the standpoint could range from three to eight times, which increase depending on water requirements, and could take up to one to two hours each day. This tedious task is done by women. The storage modes used vary from pots to drums to anything big enough available in the household for storing water.

Three out of four households in this sahi reported having made some repairs to their taps, with individuals sourcing the materials on their own, and the operator doing the repairs, at a cost ranging from ₹50-150 per time. All four households need to replace the damaged roofs and doors of their bathrooms and toilets.

One family pays the maintenance fund ₹360 for the year, while three families make a monthly payment of ₹30 per household. This is noted in a passbook provided to all the households. Apart from this, they make no other payment or contribution.

Two other households interviewed are in another direction of the village, and have water standpoints at 100 metres distance. They reported having water throughout the year, but at present depend on the standpoints like the rest of the village. The other major water source is a pond about 500 metres away, which is occasionally used for bathing and washing clothes. The trips to the standpoints could vary from four to eight times a day depending on the household chores. The quality of the water was reported to be good. The modes of storage used are drums and aluminium pots. One of the two households reported having a damaged roof in the bathroom, the other household replaced its damaged roofs and the doors of the toilet and bathroom.

One household in another part of the village reported having a limited supply of water from the water tank since the beginning, which is not sufficient for their needs. They resolved the issue by making a private bore-well in the house. The householders have also managed to replace damaged roofs, and have constructed a toilet and bathroom inside the house. They also use water from the main water tank that is supplied through pipes, and from the standpoints, but the private bore-well is their primary source.

Another household reported having installed a motor in the dug well to meet the household demand for water. It also uses the standpoints and has made some repairs to their taps and replaced damaged roofs and doors of toilets and bathrooms. The household uses drums and pots for storing water.

The final household reported having sufficient water throughout the year for their needs, and relied entirely on water from the stand post. It also reported damage to the toilet and bathing room roofs and has undertaken repairs for the tap. Their mode of storage is pots and a drum.

Water charges

The operator is paid ₹6,500 each month, and the monthly electricity bill is currently around ₹4,000. "We have an understanding in this regard, so that is why our bills are not very high," they shared. "It will help if we get a solar pump for water supply." Originally, the committee collected ₹10 a month from each household but gradually increased the charges to ₹15, ₹20, and ₹25. Now the maintenance charge is ₹30 per household, which they estimate serves 200 litres of water per day, amounting to 6,000 litres a month; if they draw more water than this, they are liable to be fined. Some families pay ₹360 for the whole year. In case of private functions or festivals, the households have to pay ₹200 for the water supply. All families make the monthly payment on the first or second of the month; if they do not make it in time, an accumulating fine of ₹1 per month is levied. There is a register with entries of collections from each family, currently maintained by Madanmohan Swain.

The committee has a separate monitoring committee/team to track and observe the misuse of water. In weekly inspections, if committee members find instances of misuse or wastage they impose a fine of ₹1,000. In a recent incident, one family which was drawing water from the main pipeline using a motor was fined ₹5,000, which was a consensus decision at the village meeting.

Water quality

The water was tested some years ago with help of RWSS, and its quality was certified to be good. There is a protocol for cleaning the water tank 6-8 times a year, which is undertaken by the villagers themselves; they also add bleaching powder to the tank and well 4-6 times a year as a disinfectant.

Village pond

The village common fund initially had a sizable amount of money from the income generated by fish stocks in the 15-acre community pond. Over the years, this income has gradually diminished, as the pond has not been cleaned for many years. There is sedimentation in the pond, as well as the growth of hyacinth and other biomass, which has diminished the quality of the water. If the pond were to be cleared, it could be used for pisciculture as well as irrigation. The pond is part of a minor irrigation project, and the villagers have asked the panchayat as well as the local MLA for funds. They will need an estimated ₹2 crore to rejuvenate the pond.

There are four small ponds in the village. One is currently being repaired through MGNREGA funds of ₹10 lakhs. Funds for streetlights, roads, and houses have also been received from the panchayat. A new health sub-centre is being constructed in the village at a cost of ₹17,92,000.

All the plastic waste in the village is collected in dustbins provided by the panchayat, so there is no litter.

Self-help groups

The village had three SHGs initially, which have now increased to 21 groups at present. Each woman saves ₹50-100 per month and the funds are mainly used for personal needs. There are currently no individual or group enterprises, although the women are keen for support for setting up economic activities. The women shared that girls from the village when they get married, go to other villages and motivate them to build toilets there as well. They find it difficult if there is no piped water supply.

Annexure 3.6.

Dumerjore Village, Dumerjore Panchayat, Kuaramunda Block, Sundergarh District

DISTRICT
Sundergarh

BLOCK
Kuarmunda

GRAM PANCHAYAT
Dumerjore

VILLAGE
Dumerjore

Households at start of GV's work (2009)
126

Households at the time of survey (2018)
163

ST	SC	OBC	GEN
135	7	18	0

Our village is like a town

The Mandira dam is built across the Sankha River and there is a canal that takes water to the Rourkela Steel Plant (RSP). As building the dam had led to the submergence of lands, the villages are in the rehabilitation area of the RSP, also referred to as the 'periphery' in the company's parlance. Villagers say that theirs is a 'steel village' – several activities in the panchayat have been undertaken by RSP, including roads, electricity, school buildings, market place, meeting area, etc. SAIL/RSP also provided support in the construction of sanitation infrastructure in the panchayat, with support from Gram Vikas. Many people in the village are retired teachers and many have jobs in RSP and ancillary industries in the neighbouring area.

Water supply system in the village

Before the addition of piped water supply in the village, people depended on a 100-year old dug well and 4-5 hand-pumps, but the water was not sufficient. Fetching water for all household needs was the responsibility of the women and it took 4-5 hours every day: "up-down, up-down, we had to make many trips to fetch water". Sometimes there would be a fault in the hand-pump which would

get repaired only after 8-10 days, sometimes 20 days. This caused additional difficulties. Women and men had to go to the backwater of the dam to bathe, which is just outside the village; the approach to the dam would get very muddy especially in summer, which was a big problem.

RWSS had started piped water supply in the village before Gram Vikas arrived there. Pipelines were laid and water connections were made through 10 stand points across the village. A bore-well was dug and water pumped by motor and distributed through the standpoints twice a day. This however was erratic and did not continue for long.

Taking leadership and mobilising the community

In 2009, Gram Vikas came to Dumerjore village and spoke with some of the villagers. They were also talking with villagers in Chotiatola in the same panchayat where the system was first established. A few men and women from Dumerjore, who were active in the village committee, went to Chotiatola to see how the water supply and sanitation system worked, and to get trained in the construction process. Dumerjore Panchayat is divided into five revenue villages and 11 village habitations.

Work on water supply and sanitation in Dumerjore started in 2010 and took almost three years to complete, and so far it has been done in all but two habitations.

After seeing the water supply in Chotialota, the village leaders started convincing all the families in their village to participate, to contribute ₹1,000 to the corpus fund and collect materials (stone and sand) for their toilets. RSP would provide all the other materials, and GV would give management support. Meetings were held every day, and the construction process slowly picked up. A few women took the lead, since they were convinced that the programme would benefit them; some men supported them as well. Jharna Kujur was one of them, and so was Manoj Barla who is currently vice-president of the village committee. Each family contributed ₹1,000 towards a corpus fund, which is kept in a fixed deposit account in the bank.

Construction of toilets and bathing rooms

Gram Vikas organised training for leaders and volunteers from Dumerjore in all aspects of the construction process for toilets and bathing rooms, while work was underway in Chotiatola. Once work on construction of toilets and bathing rooms started in Dumerjore, the leaders and volunteers would walk around their village to check on its progress. Since there was a deadline for the work, committee members often got involved in the process, digging the foundation, placing stones, and encouraging families to build their toilets on time. Payments were released subject to progress, and only after all the families had built their toilets would the water supply system become operational. It took three years from the start of work till water was supplied to the households. Funding support was received from RSP/ SAIL. All the families contributed stone, sand, and labour during constriction of their toilets and bathing rooms. The materials, including cement, rods and pipes, were provided by Gram Vikas.

Building the water supply system

A water tower with an overhead tank of 65,000 litres capacity was built. The vice-president shared that the village contributed an additional sum towards building the tank, to enhance its larger

capacity for future needs. Since part of the habitation did not get water, an additional tank of 10,000 litres was subsequently built. The bore-well which RWSS had dug continues to provide water. The tanks are filled once during the day. It takes over six hours for the tank to get filled or 'loaded' with water, and it is emptied in less than two hours after the water is released. Dilip Topo who operates the motor learnt from the Gram Vikas plumber about the pipeline system and repairs while the work was on in the village, and now he is able to undertake any repairs needed on the pipeline.

When there are festivals or events in the village the pump is operated twice. Even for private functions no charges are levied.

The water flows simultaneously across all pipelines from the water tank. Since water is released only once a day, all families have made their own water storage arrangements, some use 200-litre plastic drums, others drums and other vessels as per their capabilities. Many families have also built small open water storage tanks with brick, just outside the bathroom. The overhead water tanks are cleaned twice a year, once before the monsoons and once after, with labour contributions by the villagers.

A water quality test was done; the water is of good quality though there is a presence of some bacteria, fluoride, and nitrate.

The distribution pipeline laid by RWSS was used where possible, and additional pipes were laid to ensure water reached all the families. One of the concerns is that there is considerable variation in the depth of the pipelines laid across the village, and they face issues of leakages.

The main source of water is the bore-well that was dug by RWSS, which continues to have water although the level and quantity has gone down. Efforts were made to dig two other bore-wells but were not successful (the abandoned boreholes can be seen adjacent to the water tank). A fourth bore-well was dug, which has water, and is connected by a pipe to the tank, but no motor has been fixed to it and there is no electricity connection, so it is not in use.

Other water sources at present

There are now 12 public hand-pumps of which 5 are defunct; this includes 2 solar-powered hand-pumps, which operate in a hybrid mode. In addition four families have private hand-pumps and four families have dug wells. The 100-year old dug well still yields water, and one dug well has gone dry. Around 5-6 families have dug their own bore-wells with motors to lift water for their homes. Bidyutprabha Oram who has such a system in her village, which was built at a cost of around ₹1 lakh, said this was needed because there are 10-12 members in her family. The whole family depends on one toilet and bathing room.

There are also three ponds in the village, of which two dry up in summer and one is perennial. In summer, when water supply is lower, people bathe in the pond. No one defecates outside, since now they are all used to using the toilets.

The villagers feel that the water level has fallen by 50-60 ft. The government has supported the setting up of several lift irrigation systems, but these are not functional; villagers say this is because of their proximity to the dam.

Wastewater management

Wastewater from the bathing rooms flows into a pit and many families have planted a few banana trees and vegetables. There is no stagnant water; most of the wastewater dries up since it is very hot. The toilet waste empties into soak pits. Each household has two pits, one currently in operation, not filled as yet.

New toilets

No new toilets have been constructed in the village, though 4-5 families have been given additional water connections. These families have not contributed to the corpus fund; they had written to the panchayat in May 2023, asking for support for the construction of toilets, and are awaiting a response.

Operations and maintenance of the water supply system

A key support to the village is that the electricity bills are paid by the panchayat, which also pays ₹1,500 per month to the pump operator. Thus a major recurring cost is being met by the panchayat. The village committee pays an additional amount of ₹500 per month to the pump operator, from funds it collects from the villagers. This helps the committee maintain some oversight over the operators and keeps the latter responsive to the committee. The pump operator in Dumerjore was changed once three years ago, and the motor is currently being operated by Dilip Topo.

Only another village in the Panchayat, Baniguni, gets the same support from the panchayat; other villages collect and pay their own electricity bills and operator fees. The villagers of Dumerjore feel they are lucky, and that it is difficult for other villages: electricity bills can be as much as ₹5,000, requiring monthly contributions of ₹100 per family; added to this is the payments for the operator and repairs, for which they would need to make additional collections.

There is a monthly collection of ₹20 per tap for each household; with three taps, most households pay ₹60 a month. A cashier has been appointed to keep record of the collections, which are usually taken at the time of the meeting, which is held on the first Sunday of every month. Other matters pertaining to the village community are also discussed in these meetings. In the meeting on June 4, villagers discussed the forthcoming festival on June 27 when they will do a puja before sowing the crop. They have decided that those who can will contribute ₹300 per family for the festival.

Fines and penalties

There used to be a rule imposing a fine in case of non-payment of dues, but this has never been enforced. After a few warnings by the village committee in 'hard language,' families usually relent and pay their dues. If the payment is not made on time, they have to pay an additional ₹10 the subsequent month.

Shocks to the water supply system and how they face it

The monthly collections for the water supply programme are kept in a savings bank account. This has come in use especially when there are bulk expenses to be met, such as repairs to or replacement of the motor, which had to be done twice in the past years, most recently in 2022, and earlier in 2017. On both occasions they had to spend around ₹40,000. In the first instance they withdrew the money from the savings account where the maintenance collection was deposited. In 2022, since the two signatories were not present (one villager and one person from Gram Vikas), they were unable to withdraw the money. Since the problem had to be addressed immediately, they collected ₹300 from each household. As a result, the households are not at present contributing to the monthly collection, but plan to resume again soon.

The village committee took on the responsibility of replacing the motor. They went to Rourkela to check the different models and bought a 3-HP Kirloskar pump. The women said water supply was disrupted for about a month (the men thought it was disrupted for a week) while the repairs were being done. During this time, households relied on the hand pumps and also on the two solar-driven hand-pumps (hybrid) installed in the village.

Currently a few families in Purantola hamlet, which is at a higher level, are not getting water in their pipes. The village committee is yet to look into this issue seriously. For some time the hamlet was connected to the smaller water tank of 10,000 litres, but since there was a shortfall in supply, the connection was removed and the families went back to depending on the main tank, from which water did not reach everyone.

Villagers are able to undertake minor repairs of the water supply system and toilets. When there is a serious issue, they get someone from the Karuamunda block headquarter. Some roofs of toilets need to be repaired, which was left to the capabilities of the individual families. The villagers were hoping for some support from the government or Gram Vikas for the repair of toilets.

Committee reconstitution

For ten years the same village committee was in place: their leadership was accepted throughout the village, and they kept accounts and records well. The committee was reconstituted a few months ago; some younger persons have been inducted, while some of the older members continue. It currently has five men and five women.

Relations with the panchayat

The village had a Sarpanch in the panchayat in the past and there is a ward member from the village at present. They are aware of the panchayat's development plans and the funds that are allocated. They have recently received funds for the development of the pond and for road repair, but not for the building and repair of toilets, even though a survey has been conducted for building new toilets and applications have been made.

Other institutions and common resources

The village is surrounded by a forest and it is part of an active Van Suraksha Samiti. The Samiti ensures that there is no indiscriminate felling of trees and protects the forest from outsiders. It has a mixed species of trees, and a variety of seeds and other products are available seasonally.

All the families from the village can collect firewood and other forest produce as per their needs; some also sell forest produce.

The pond near the village is used for pisciculture. RSP introduces fingerlings into the pond, and at harvest time, all the families are free to harvest as much as they can, which is consumed by the household, as well as sold to generate additional incomes for families.

Women's groups

There are women's self-help groups (SHGs) in the village which undertake regular monthly savings of ₹50 to 100 per member, to be used for internal loans.

Jharna Kujur, the ASHA worker and who has been closely involved with the programme since the beginning shared that the SHGs used to be very active. The members in her group were involved in many activities: making soap, phenol, liquid blue for whitening clothes, candle-making, mid-day meals for schools, managing the village haat, organising cultural programmes in the panchayat, maintaining a nursery to sell saplings, and the collective cultivation of potatoes, sesame and horse gram. These activities continued up to Covid, and slowly reduced as members' interest waned.

Solid waste management

One SHG has currently taken the responsibility to collect and segregate solid waste. After several months of awareness creation, they now go around the village on a cycle for over 3-4 hours, collecting segregated waste from the households. This they take to the sorting centre near the panchayat and separate and pack it. The waste is picked up by a truck from the block periodically; this has been done twice so far. This system was introduced last September, and after several rounds of awareness, has been working well, and the village looks clean overall.

As we were leaving the village Jharna Kujur proudly shared, "our village today has all the facilities of a town".

The path ahead

The village has an interesting hybrid model. The village committee is reaping the benefits of the panchayat covering the main operational costs of electricity supply and operator fees, while they contribute to supplement the operator charges. The system has not been completely 'taken over' by the panchayat – they provide financial support, while the committee is still active and addresses day-to-day issues that arise, including those related to the motor. There has been a significant decline in groundwater levels in the village and the villagers will have to face that challenge in the future, especially as the trend of private bore-wells, of which there are just a few, picks up.

Note on Village: Teterabal, Panchayat: Dumarjore, Block: Kuarmunda, District: Sundargarh, Orissa

Background. We made a short visit to Teterabal village in the afternoon of June 5, 2023 to see an example of a recently formed committee. A hamlet of 52 households, the village had set up a committee in 2020 and was running its own water supply system, paying for the electricity and

operations. The construction of toilets, bathrooms and a water tower storage tank was supported by MCL and implemented by GV. We met with Sunil Tigga, a cadre person in the village, Gola Tigga, the president, and one other person.

Previous situation. Residents drew water from 6-7 shallow dug-wells spread across the village. The water table in the village is very high – most wells have water just a few feet below ground level most of the year, which goes down in summer to around 12-15 feet.

Aquifer and water supply infrastructure. Given the high level of groundwater in the village, and the experience with failed bore-wells in neighbouring villages, GV (with MCL support) made a new shallow dug-well for the water supply system, and pump water from the dug-well to a small tank of around 25,000 litres. The dug-well is 15 to 18 feet deep; it was difficult to make it deeper as water kept seeping in from the sides during construction.

Water distribution. Water is supplied for 24 hrs most of the year. Prior to the installation of the water supply system, the villagers repaired pipes and taps in 11 households to fix leaks, so as to avoid wastage. The villagers have been facing a problem in summer these last two months and there has been a reduction in supply: water is supplied for one hour in the morning (6-7 am) and half an hour in the evening (5:30-6:00 pm).

It was mentioned that the main pipelines have three 'chambers' (gate-valves). The president felt that they needed to install around 5-6 gate-valves, to be able to control the flow more effectively across the village in case of repairs, etc. A collateral benefit would be that they could also make credible threats of withholding water supply for residents who were not paying their bills.

Water supply expenses and revenue. The primary expenditure is on electricity charges for the motor, at about ₹2,500 per month. An example of the electricity bill amounts is shown in the table below.

Time period	No. of days	Electricity bill amount (Rs.)
1/7/21 to 20/7/21	20	1,510
1/3/2022 to 31/3/2022	31	2,580
2/7/2022 to 28/7/2022	27	2,213

The operator charges per month are ₹1,200, and ₹300 a month is paid to the village cadre to keep the books in order. From what we could make out this was money well spent, as the record books had been systematically maintained. The committee used to collect ₹50 per month from each family, which increased to ₹100 in September 2020. People pay the fees at meetings or come to the operator's home to pay. For special occasions like marriage, the charge is ₹200 per day. They are planning to introduce a fine of ₹1,500 per day for someone who is using the water supply for building a house.

In the initial year, virtually all the 52 households paid their dues, but over time, the number of defaulters has increased. In a recent meeting, the decision was made to ask those who had not paid for more than five months, to pay up. The following table shows the number of people who have been paying the charges each month and the changes over time.

Month	Number of households who have paid water charges	Remarks
Aug 2020	52	
Sept 2020	52	
Oct 2020	46	6 people did not pay, as they did not get water then
Oct 2021	51	
Jun 2022	46	
July 2022	44	
Dec 2022	36	
Jan 2023	36	
Feb 2023	32	
Mar 2023	29	
April 2023	16	Sunil, the village cadre, was getting married in early June, and did not collect money in April and May. Also, the water supply declined in summer.
May 2023	9	

Water quality. We visited the water supply dug-well. It was mentioned that tests had earlier shown that the dug-well had bacterial contamination during the monsoon, but that the water was fine the rest of the year. Therefore on March 21, 2023 it was decided to do 'mitigation' around the well. The area around the well had some shallow areas and a pit as well, where waste water used to accumulate. It was decided to 'mitigate' the contamination (GV language), by filling up the depressions and pits around the well so that water did not accumulate and the water quality was maintained in the well. This was done, and the water was tested on May 21, 2023.

A person from an adjacent hamlet mentioned that the name Teterabal signifies a moist area with the presence of moist soil and this village lives up to its name – with high levels of shallow groundwater. The water levels are high most of the year, but availability goes down in the summer and the shallow dug-wells tend to dry up. The committee has developed a good system of maintaining records; they make their electricity payments and have addressed contamination issues. Over time there have been gaps in the monthly payments, which shows that it is quite easy for a well-functioning system to start developing cracks and face concerns, especially with resource mobilisation. It is hoped that they will get back on track and restart their monthly payment system.

Annexure 3.7.

Gramdebati village, Khetamundali Panchayat, Jaganath Prasad Block, Ganjam District

DISTRICT
Ganjam

BLOCK
Jaganathprasad

GRAM PANCHAYAT
Khetamundali

Households at start of GV's work (2007)	Households at the time of SAS survey (2018)
46	**54**

ST	SC	OBC	GEN
54	0	0	0

Socio-economic context

Gramdebati village of Khetamundali Gram Panchayat has three small hamlets, Talasahi which consists of 19 households, Mundiasahi with 24 households, and Dhobasahi which has 7 households, predominantly inhabited by khond adivasis. Located very close to the Daspalla elephant reserve, the corridors of these villages are susceptible to elephant crossings. Located at the border of Ganjam and Nayagarh districts, these villages have little access to public transport. All three sahis are together part of the Vana Suraksha Samiti. The ward member for the panchayat is currently from Dhobasahi.

Gram Vikas has been working in the area of Jagannath Prasad Block for over 30 years.

Gramdebati Mundiasahi

The villagers talk about the support provided by Gram Vikas for social forestry, cashew cultivation, and learning centres for children in the village. All the children now go to the primary school in the village and attend high school in Khetamundali. They proudly shared that one of the girls from the village went to Navodaya Vidyalaya, and recently completed her graduate studies in biology; she plans to become a teacher.

The people of Gramdebati decided to join the programme to build water supply and sanitation systems in 2007. Nuasahi and Tirigochha, neighbouring villages, already had piped water supply, toilets, and bathrooms with Gram Vikas' support.

Construction of the toilets and bathrooms started in June 2008, and was completed a year later in September 2009. The total number of households at that time was 46. Initially, all the households in the three sahis shared the water supply system. After some years, Talasahi and Dhobasahi were disconnected from the system due to their non-payment of electricity charges and other expenses. At present, the Mundiasahi has an independent water supply system catering to 24 households, and to the primary school in the village.

Before the water supply system was set up, women and young girls had to walk over half a kilometre to wells, ponds, and tube-wells to fetch water for household needs. A dug well was one of the main sources for drinking water, but it would dry up during summer creating an acute shortage. Now that there is a piped water supply system in place, it is easier to access water and use toilets and bathrooms, especially for women, for most months of the year.

An elderly woman who has witnessed conditions before the water supply system was functional as well as Gram Vikas' work over the years remarked, "Each day we (women) had to go to fetch water from the dug well for household activities and water was sufficient then. Now that there is a whole system in place but water is still not sufficient." Even though the water supply to Talasahi and Dhobasahi has been disconnected, Mundiasahi still faces an issue with water availability in peak summers. Dhobasahi is still not connected to a water supply system.

Water sources and the water supply system

A perennial stream near Talasahi was harnessed initially for water. For the water tank, a 5,000-litre sintex tank was placed in an RCC tank in Mundiasahi, at a location from which water could be distributed to all families across the three hamlets. However, this system proved to be inefficient, susceptible to frequent breaks and cracks, with elephants trampling on the tank. The distance from the source to the tank was also a factor affecting supply.

A bore-well was therefore dug near the water tank, connected to electricity, and water was lifted through this. This system worked for some time, but raising collections for the electricity bills from the three sahis became a problem, which adversely affected the system. Over time, there were frequent break downs of the motors: around three motors had to be changed over a short span of time in the last few years. These repeated shocks were resolved by the committee. At one time they collected ₹10,000 for motor repairs from the villagers.

The people of Mundiasahi, where the operator resided and which had active members in the committee, issued warnings to those who did not pay, and eventually decided to cut the water supply to Talasahi and Dhobasahi.

Electricity charges kept rising and went up to ₹20,000 per month, which was unaffordable for the small habitation. Given the continued difficulty in paying electricity bills, the water tank in Mundiasahi has recently been connected to a bore-well, with a pump run on solar power, a change that has been appropriate.

Building a corpus fund

In 2007, each household in the three sahis contributed ₹1,000 to set up a corpus fund, which amounted to ₹46,000 as there were 46 households at the time. This fund remains with the original committee members as signatories, and has not been divided among the three sahis. Villagers were unclear about its status and use.

The village water and sanitation committee was reconstituted around six months ago. To meet the expenses of the water supply system, the committee collects a monthly amount of ₹50 per household as maintenance on the first day of the month.

Almost 16 years since the first toilets and bathrooms were constructed, some of the toilet roofs and doors need repairs. Nonetheless, toilets and bathrooms are still regularly used by the villagers, most of whom now dislike going outside to defecate.

Self-help groups (SHGs) and other activities

The village currently has one SHG with 11 members saving ₹50 monthly. There are no group enterprises as yet but the group has received sanction for a goat shed for ₹50,000: "we have built a shed but there are no goats," they shared.

There is access and availability for forest produce, but the villagers' dependence on the forest has reduced over the years, "with changing times". Women still gather mahua flowers and bamboo and sal leaves which they sell; they also sell plates woven from the sal leaves. Earlier wood for the plough was gathered from the forest, but cutting trees is no longer encouraged.

Currently, the villagers are together undertaking renovation of a pond, for which private land was donated to the village and the labour is being collectively mobilised. After the renovation of the pond, they plan to start pisciculture in the pond.

Gramdebati Talasahi

Talasahi and Mundiasahi initially shared the water supply system. Talasahi situated on the upper side of the village had a limited flow of water due to pressure differences. When water supply to their village was disconnected, the villagers felt this was unjust, as they did not have piped water supply for many years.

Water sources and the water supply system

The sahi has two dug wells, of which one is perennial while the other tends to be dry during the summer. These dug wells are connected to three hand pumps. The other major water source in the village is a pond.

In 2022, with support from Gram Vikas, 19 families of Talasahi built a water tank with a capacity of 12,000 litres. One bore-well is connected to the tank which is solar-powered and provides 24x7 water supply. Since the habitation is small, once the tank is filled the water is sufficient for all the households for two days. The motor is switched on again if the water flow in the taps, especially in toilets, tapers off. Shanti Jani, an active member of the village committee is also the operator of the water tank.

Construction of toilets and bathrooms and overhead tank

Contributions to the corpus fund were made jointly in 2009 with Mundiasahi. When it came to construction of a new tank, the villagers came together for daily meetings to make decisions. The 25-sq ft land, on which the tank is constructed, was donated by Prashanti Jani to the VWSC. The community collectively contributed boulders, sand, and labour, while Gram Vikas provided cement, technical assistance, and plumbing and mason training in the course of the construction. The village youth have voluntarily taken on responsibility of clearing the water tank periodically, 3-4 times in a year, on no fixed date.

The water supply was made functional only after all the toilets and bathrooms were constructed. Of the 19 households 12 already had toilets and bathrooms and 7 had recently completed them. They had made applications for a toilet subsidy under the Swachch Bharat Mission, but this had not yet been sanctioned, so they constructed at their own expense.

Water quality and greywater management

The toilets were constructed with two soak pits. All the plastic waste is collected in a community dustbin and later burnt; women usually take turns to do this, depending on their convenience.

Grey water from bathrooms is not allowed to stagnate and is used in kitchen gardens to grow brinjals and chilies. A water quality test was done by the Gram Vikas team and the presence of fluoride was discovered. The team also conducted several interventions and spread awareness about the importance of improving water quality and good sanitation behaviour.

The village water and sanitation committee

The committee is in charge of the functioning of the water supply system. Households pay a monthly amount of ₹30 each, usually collected on the 20th of the month. The money is set aside for repairs and other contingencies. At present there is no system of fines, because all the villagers are part of one large family, 'gote ghar,' as Shanti Jani explained.

An amount of ₹200-300 is usually collected from each household annually for religious festivals, by a leader who overlooks the festival each year; the balance of the fund is used for subsequent festivals.

The panchayat has supported construction of the houses and provided street lights; it also constructed a community hall in 2004.

Self-help groups (SHGs) and other activities

The sahi has two SHGs, one with 10 members saving ₹100 per person per month and another with 15 members saving ₹50 per person per month. The women had initiated joint enterprises for soap-making and mushroom cultivation, but these are currently at a halt. The SHG has leased the village pond for pisciculture in previous years, and are cultivating various fingerlings; the lease has been renewed for over two years enabling the group to make a profit. At present Shanti Jani has taken this on as an individual venture by investing money for the fingerlings.

The SHG also manages a nursery, located across from the pond. It has a collection of a variety of saplings – cashew, tamarind, jackfruit, papaya, guava, and moringa – and made a profit of ₹50,000 by selling the seedlings to Gram Vikas. The women have also leased community land to plant mangoes, moringa, and cashew.

In the midst of all these changes, the families of Dhoba Sahi have been left out. They currently do not have piped water supply.

VPRP and GPDP

Gram Vikas is working in all the villages in the panchayat and has facilitated the process of preparing Village Poverty Reduction Plans (VPRP) which feeds into the Gram Panchayat Development Plan (GPDP).

Annexure 3.8.

Kanamana Village, Kanamana Panchayat, Chatrapur Block, Ganjam District

DISTRICT
Ganjam

BLOCK
Chatrapur

GRAM PANCHAYAT
Kanamana

Households at start of GV's work (2007)	Households at the time of SAS survey (2018)	Current number of households (2022)
144	**165**	**182**

ST	SC	OBC	GEN
39	53	57	16

A cohesive mixed community and strong sustained leadership

Kanamana village in Chatrapur Block of Ganjam is located in a coastal industrial area, in close proximity to Indian Rare Earth Limited, a privately owned titanium factory and other ancillary industries. A few people from the village work in these industries, in permanent and temporary jobs. The village is close to the National Highway.

People from the village migrate seasonally to other states – Mumbai, Hyderabad and Chennai being popular destinations. Land ownership is limited, land holdings are small, and cultivation takes place usually during monsoons. There are also many landless families. Most families have patches of kewra, from which flowers are collected and sold to traders from Kannauj who visit the village.

Kanamana is a mixed village; it has both Odia and Telugu-speaking families, from different castes and economic categories.

Water resources before piped water supply

Before the piped water supply system was set up, the villagers depended on water from two dug-wells, about 1.5 km away, and two hand-pumps. People, old and young, bathed at the wells, which also catered to the needs of animals. The location of these wells was such that people had to wade through wet mud often, and as they balanced pots of water, they sometimes slipped and fell. This daily errand, taking almost 40-60 minutes, was mostly done by women, and often needed multiple trips to fetch water. Some people had personal wells on their lands.

The pond in front of the village was also used for bathing. The initial bore-well was dug by the government RWSS in 2007, water was found at a depth of 450 ft, and the RWSS provided a stand point to collect the water. Around the same time, Gram Vikas came to the village and began meeting and talking to the leaders initially, and then the entire community, about undertaking a water supply and sanitation programme in the village. The village leaders discussed the merits of each programme with the whole village. The appeal of piped water supply and toilets was very strong, and people agreed to work on the programme with Gram Vikas. The RWSS handed over the two bore-well sources to the village community. One of the bore-wells is still being used with a motor; the other, located in the school, is not being used, since it has not been connected to the motor.

Once there was complete consensus among the households, work started on construction of the toilets and bathing rooms in June 2007. A village committee was formed to plan and oversee the progress of work. Given the differences in resources and abilities among the village residents, construction took time, and work was completed in January 2010.

Resource contributions for the construction of toilets and bathrooms

The village committee leveraged ₹3,500 from the government for APL families and ₹5,000 (₹2,800 + ₹2,200) for BPL families for the toilets. The remaining cost of building the toilets and bathing rooms was borne by the families, who contributed in terms of labour and materials (stones and sand), meeting nearly 60 per cent of the costs. All toilets have twin soak pits and continue to be in use. Some pits have been filled in the course of time, have been cleaned and continue to be used by 4-5 families. The majority of the families are using the first soak pits.

The masons and technical support were provided by Gram Vikas, who also trained local people during the construction process. They also provided training in plumbing and helped the village committee purchase other materials like cement, iron rods, pipes, etc.

Those who depended on daily wages found it hard to make their contributions; families with such difficulties were supported at the time of construction, and allowed to repay over time. The committee kept records of all these.

Building a corpus

At the start of the programme, the committee also collected ₹1,000 per household to set up a corpus fund, which has grown with the addition of new households. The fund amount has been placed in a fixed deposit. The total number of households at that time was 144, which has increased to 182. Many families have been able to access funds from the government under the

Swachch Bharat Mission to build their toilets, which they constructed on their own as per their requirements and budget. Only after the families build their toilets and contribute to the corpus, are they connected to the water supply system to receive piped water supply.

The overhead water tank

The village came together to build one overhead water tank, with a capacity of 38,000 litres. For construction of the water tank, Gram Vikas helped the village committee leverage funds from the government and provided material and technical support. The villagers made labour contributions to build the water supply system. A bore-well connected to electricity was the main source of water for the water supply system. Over time the demand for water has increased, with new households and a growing population, while at the same time electricity charges have also been increasing. In 2023, with support from Gram Vikas the villagers added to their water sources by digging another bore-well connected to a solar-powered pump. A pipeline was laid from the new well connecting it to the water tank. Once again, the villagers contributed their labour; a few households which could afford made cash contributions, and local people were employed.

The village also has five hand-pumps and eight dug-wells. There is a medium-sized pond in front of the village, across the road and adjoining the school. At times of shortages, the villagers depend on these for their needs. A few families have also dug their own bore-wells.

Changes in water supply charges

The village committee currently collects a monthly amount of ₹30 per person, to pay for electricity and maintenance of the system. Therefore, a household of five persons now have to pay ₹150 a month, which is the same amount being charged from families renting accommodation in the village as well. Earlier the monthly charges were ₹50 per household. With the shift in power distribution to Tata Power, there has been a steep increase in the tariff from ₹3,000 to ₹14,000 per month. This has necessitated a revision in the amount collected from each household, an issue that was discussed in the village and agreed on by consensus.

Different charges

There are differential charges for commercial establishments like car garages and shops (₹500 a month) and extra charges for family functions when water is drawn from the water supply system. In the event of a private function or festival, the household has to take permission from the committee to draw water and is required to deposit ₹600, of which ₹300 is used for the water and ₹300 is towards cleaning the garbage (which is refunded if the household clears this after the function). If this payment (₹300 + 300) is not made, they have to pay ₹750 the next month. The village supplies water for free to the Kanamana Upper Primary School and the anganwadi located across the road.

Payment collection system

The committee earlier would go house-to-house to collect the monthly charges, which was time-consuming. Subsequently, they devised a system where committee members met at the temple on a designated day in the month, village residents came there to make their payments. If they did not pay one month, they paid the next month. The committee keeps detailed sheets to record the monthly contributions, which has been updated till December 2022; the records for 2023 have yet

to be updated. The records are simple, and give a ready sense of who has paid and who has not.

Payment of electricity bills

The president proudly shared that ever since the system was installed 13 years ago, they have paid the electricity bills regularly, without any arrears; the electricity has never been cut due to non-payment. Meter readings are now digital, so the electricity company does not come to the village to take physical readings. It would have helped if domestic rates were charged for electricity; at present, electricity is being charged at commercial rates, which is a burden for all the villagers.

Regulating water supply

In the initial days water was supplied 24*7. Now, some regulation of supply has been needed given the increased use and misuse of water, as well as increasing electricity charges. At present, the motor is run twice a day from 5 to 11 am and from 5 to 6 pm, with water being released simultaneously. While most households receive equal amounts of water, some houses on higher elevations claim to have shortages due to low water pressure.

The villagers are not allowed to divert the water to their vegetable gardens. Till the time of Covid, water was being supplied 24*7. After the introduction of supply regulation, some families have begun storing water in their homes, but they are not allowed to use motors to draw water from the main pipeline. There is periodic monitoring and families which do not follow these rules or waste water are given warnings. A few families have private bore-wells, which they run by motor to meet their domestic needs. The dug-wells are slowly becoming dry, but as the bore-well sources have sufficient water, there has been no fall in the supply.

Differential water supply

Five households located on one side of the village said they had a differential supply of water due to low pressure; they depend on a hand-pump near their households, at distances ranging from 10-80 metres. The women said that the daily task of fetching water from the hand-pump can take 30 minutes to over an hour per day. A common practice across all these households is to store water in any available vessel, from aluminium pots to buckets to drums.

Even though water is sufficient for almost all the household chores such as bathing or use in the kitchen, the supply is affected during peak summer months. Another concern raised by the people was the installation of motors in individual households to draw water from the main pipeline, thus affecting the already sporadic supply and availability of water. They are also concerned about the poor quality of water and the presence of white particles in it.

While there is consistent usage of toilets and bathrooms across all the households, repairs are needed on the roofs and doors, which is a problem faced by all, especially during the monsoons. Many toilet roofs were repaired and replaced by using individual funds, the repairs of the taps were undertaken by the operator, but individuals bear the cost of the materials.

Pump operation and management

Raja Rao Reddy serves as the pump operator and is paid ₹5,000 per month. He runs the pump through a remote dial-up service on his phone, which connects to a sensor near the pump. This was purchased last year at ₹13,500. Only he has access to it. If there are any repairs to be made in the pipes, he is the one who fixes it. Raja Rao is also president of the VWSC

With the addition of a new bore-well run on a solar pump, it is hoped that the electricity charges will be reduced somewhat, and more water will be available to all households.

If taps in the toilets or bathing rooms break, they must be replaced immediately by the individual families to avoid wastage of water. Many families have upgraded the old toilets and built new toilets based on their resource availability. Only after they have built their toilet, and it is inspected, are they connected to the piped water supply system. Around 40 such connections have been made. Ten families received support from Swachch Bharat Mission for building toilets.

It has been nearly 15 years since the construction, some toilets need repairs – the asbestos roofs have cracks and leaks during the rainy season. While individual households must carry out these repairs, the village committee helps to get funds where possible from the panchayat.

Water quality

A water quality test was done by the GV team in December 2017 revealing a fluoride problem in the water. Recently the IRE also collected water for testing but the results are not out yet. The water source from the new dug-well was supplying salt water (which was not good to taste); the water was tested and the quality has improved according to the villagers. No intervention has been made to improve the quality of water.

Waste management /grey water management

The village looks clean. All the plastic waste is collected in a community dustbin and is later burnt. In the years immediately following construction, there used to be regular monitoring of cleanliness. The anganwadi didi also participated in overseeing this. Volunteers from the households took turns to clean the village each week in groups of ten, which helped build a culture of cleanliness.

Grey water from the bathing rooms is not allowed to stagnate and is used for kitchen gardens to grow brinjal, chillies, papaya and bananas, wherever possible.

Village institutions

The Village Water and Sanitation Committee (VWSC) is called the jolo porimal comiti kanamana. There is a registered society in the village. The committee members are the same since 2008 and committee reformation has not taken place; only one senior member is not active. There is no auditing of accounts; every January the committee shares the accounts with the village, which consists of the amounts received, what was spent, and what is the balance.

Other than the VWSC, there is another village committee which looks into the general welfare issues of the villages, community festivals, etc.

The village initially had four SHGs, mobilised with support from Gram Vikas. At present there are 10 SHGs, where the women save ₹100 per person per month, which is used primarily for personal needs. They maintain records on their own, although there are no individual or group enterprises. Some years ago the women made bags on an order from the District Rural Development Authority. They were also given training in sewing, and 10-15 sewing machines were provided.

Meetings of the committee

In early days of the programme, especially when construction was going on, there were regular meetings, sometimes more than once a day. As the system became streamlined, the committee decided to meet once every month, on sankranti. This however did continue for long. At present there is no stipulated time for the meeting of the village committee, and meetings take place when there are resolutions to be made or in the case of emergency discussions or situations.

Changes in the habitation

When Cyclone Titli hit coastal Odisha in 2018, many families were affected. Seventeen families from Kanamana were rehabilitated in a neighbouring hamlet called the ORDP colony. They have built their own toilets and bathing rooms, have a separate water tank with a capacity of 10,000 litres, and a bore-well that runs on a solar-powered pump. The ORDP colony has a separate committee to manage the system

Spread effect

Kanamana became the first village in the panchayat with a functional water supply system and toilets and bathrooms; following it, the neighbouring village Chasa Kanamana also decided to participate in the programme. Leaders from the village had gone to other villages to spread the word. Other villages in the panchayat have not yet joined the programme, and the women there are still facing a lot of problems, fetching water, facing unclean surroundings, etc.

Engaging with the Panchayat

The village committee has an amicable relation with the panchayat. In 2021, the committee spent ₹80,000 to repair cracks in the water tank and paint the walls. They considered withdrawing the money from the corpus fund, but when they enquired about the process, it turned out to be complicated, since the former Executive Director of Gram Vikas is a signatory, the bank demanded physical verification before the funds could be withdrawn.

The committee members applied to the panchayat, which agreed to provide some funds, which was supplemented by the committee's savings fund. While upfront payments were made from the community fund, it was later reimbursed through the funds from the Panchayat. It took 10-15 days to complete the repairs, but the water supply was interrupted for only a day.

The panchayat had provided the village with 20 street lights, and built cement concrete roads and a cemetery; a kalyan mandapam is under construction. The MLA supported construction of the temple. Under NREGS, a 400-m drain was constructed; a youth group took on the task of implementing the work, which ensured it was done properly.

The IREL had provided solar street lights, but these are not working presently due to a battery failure. Each year the IREL provides fingerlings to stock the pond. The village committee oversees the fish harvesting and distribution to villagers. The catch is sold at a subsidised rate to the families, and the income from this added to the community fund.

The RWSS visited the village once again with the Vasudha Programme, promising water connections to all the households. A large water tank has been built under the programme just outside the village, but the villagers are not sure when it will be operationalised or what they will have to pay. They are confident that the water supply system they currently operate will continue, since they are not sure how reliable government water supply will be.

Annexure 3.9.

Kudupakia Village, Sirtiguda Panchayat, K Nuagaon Block, Kandhamal District

DISTRICT
Kandhamal

BLOCK
K. Nuagaon

GRAM PANCHAYAT
Sirtiguda

VILLAGE
Kudupakia

Households at start of GV's work (2013)	Households at the time of survey (2018)
112	**115**

ST	SC	OBC	GEN
18	**84**	**1**	**3**

A village well-endowed and yet in want

Kudupakia village, in Sirtiguda Panchayat, is located just off a busy National Highway. Gram Vikas has worked in most villages of Sirtiguda Panchayat. Employment is a serious concern in the village, which has over 60 to 70 graduates, but there are no jobs. Some villagers are teachers and some have government jobs; migration for employment is common, with most people going to other states, most commonly to Kerala, Karnataka, and Tamil Nadu. The majority of the households in the village are Christian.

Water access before piped water supply

Before the installation of the water supply system, villagers depended on a well about a kilometre away and a spring (chuaan) which yielded some water. In summer, they had to scoop out whatever little water was available There were also a few hand-pumps, of which only one still functions. Some of those who go out to work bathe at Sirtiguda dam or in the Adaki River.

Coming together to build sanitation infrastructure

In 2001, the organisation Pradan came to the village and helped the villagers form self-help groups (SHGs). Gram Vikas arrived in the village about ten years ago, and enquired if the villagers would be interested in working together to join the water supply and sanitation programme. With Gram Vikas' help the village received financial support from the government under the Swachch Bharat Mission – ₹12,000 per family, and additional ₹13,000 from ITDA.

Each family made arrangements for 1,000 bricks, some families worked in groups. All the families collected stones, and with technical support from Gram Vikas built their own toilets and bathing rooms. There was a storehouse in the village where the cement and other materials were stored.

Building the water tank

The villagers worked collectively to build the water tank. While there was support from RWSS, all the families had to make contributions of labour. Water supply to the homes started in 2015. There was sufficient water for all the families, through the day. Water would be filled during the night and released during the day. Many families also store water in their homes in storage vessels and drums. If there are problems in the toilets and pipes, they can undertake the repairs themselves, and there are also 8-10 trained masons in the village.

Collections for operations and electricity

The committee collected ₹10 per family money to pay ₹800 to the operator, which was later raised to ₹1,000. One person was trained by Gram Vikas, and later others learnt too.

For the electricity bills, the committee collects money from the households and makes the payments. The bills have not come regularly, sometimes only after 2-3 months. Further, the rates have been increasing: in January 2016, the monthly electricity bill was ₹1,530, which increased to ₹18,000 in 2019. Some people were unable to pay, which created conflict within the village. In September 2021, the arrears totalled close to ₹2 lakh, while the monthly bill was ₹4,000. Because of non-payment of bills the water supply has been disconnected for more than a year. Last year some of the village members went to the electricity department in Baliguda to meet the Junior Engineer, then to the district headquarters in Phulbani, but were told that nothing could be done, and they have given up their efforts.

Other water sources

About two years ago, the government set up a solar-powered hand- pump, connected to two taps. Since the closure of the piped water supply system, families (mainly the women) have had to go to these points for water; the water is insufficient, but they manage. In one hamlet, Kakamaha, 13 families have sufficient water from four wells which have been dug with support from OTELP. PRADAN also set up a gravity-flow water supply system which brings piped water into their homes. Water is available in this system for 6-8 months of the year, but there is no water during summer.

New families and connections

There are 30-35 new families in the village, but their names have not been added to the list for support from the government under the Swachch Bharat Abhiyan, from which others in the village have benefitted. They have not built their toilets and bathing rooms and continue to use the

toilets in their parents' homes. A few better-off people, who are in service, have built their own toilets.

Forest committee

There is a Vana Suraksha Samiti, but not much collective activity. No outsiders can cut wood from the forest, but all villagers can access the forest. They get sal seeds, make siali plates, mahua, mango, etc. They collect fruits and seeds and sell them to traders near their village.
Self-help groups: The women have been organised into SHGs; 10 currently exist in the village, and they have periodically received support from OTELP and Mission Shakti. The groups were given poultry to rear as a livelihood activity, but these did not survive; they also got a power tiller and harvester from the government, but these are not being used. The groups collect ₹20-30 per week and rotate the credit within the group, along with doing some collective NTFP-based work.

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MGNREGS

Villagers participate in MGNREGS work when it is available, for which they receive ₹222 a day, but the payments are not always received in time.

Augmentation of water source

To augment the water supply, an open well was dug with support from Gram Vikas last year, and this will be powered by a solar pump. The location identified for digging the well was changed by the villagers three times. Finally, in the location that they began digging, there was no water supply up to 30 feet. The villagers pooled money to buy 12 cement rings which were used to deepen the well, and there is sufficient water now. The villagers are planning to complete the stone binding of the well and its cover, so that it can become operational. A new pipeline was laid from this well to the water tank, a distance of more than a kilometre, an enterprise in which all the villagers participated. They formed groups of 5-6 and plan to complete the work in a day. If anyone could not come to work that day, they paid in kind and the group leader would re-organise the workers. The pipe was donated by Gram Vikas. About 200 metres of the connection to the water tank remains. The committee is working actively to make sure they get the water supply system operational again.

Annexure 3.10.

Tala Landusahi Village, Laxmipur Panchayat, Rayagada Block, Gajapati District

DISTRICT
Gajapati

BLOCK
Rayagada

GRAM PANCHAYAT
Laxmipur

VILLAGE
Tala Landusahi

Households at start of GV's work (2006)
44

Households at the time of survey (2018)
50

ST	SC	OBC	GEN
50	0	0	0

History of the village

The current location of Tala Landusahi is close to the main road in Laxmipur Panchayat. The villagers apparently moved to this site a few decades ago; they used to live about half a kilometre above on the hillside. At the time of the shift, some people came down to Tala Landusahi, while a few families moved further up to Upar Landusahi. There has been a general village committee since 1992, and one of the first activities it undertook was to run a non-formal school.

History of the Village Development Committee

Gram Vikas first came to the village around 1986, and work on setting up a water system in the village started in 2006. As reported, meetings were held regularly, morning and night, to convince the villagers about the benefits of the system. GV's pitch was simple – they would give them the purchased material, and the villagers would do the rest.

They also began work related to social forestry, mostly on private land: earlier there had been no bamboo, now there was too much in the village; cashew, lemons, mangos and pineapples were also planted. The current president of the Village Development Committee (VDC) Gourang Sabar, was initially the treasurer before he became the president. In between, he had left the VDC for three

years, at which time the water system did not function well; in his own words, there were pipe leakages and broken taps, and the monthly charges were not collected. He returned as president, and the VDC was reconstituted in mid-2022 and made broad-based with 15 members, including several women. The current secretary is a young woman, Anjali Sabar, who also works as a teacher in Shishu Mandir School.

All the records were recently audited, for which ₹4,700 was paid from the VDC funds to the Lekha Mitra.

VDC meetings

VDC meetings are reportedly held every fortnight, on the 15th and 30th of the month. The preferred meeting time is 5 am before people get busy with their work; they tend to avoid having meetings in the evening. Important resolutions are entered in the resolution register.

The water system pre-intervention

Before the GV-supported piped water system was set up, the Tala Landusahi villagers used to get water from the spring at Amar Singh Nala (on the boundary with the neighbouring Amar Singh village). The village also had two dug-wells, which dried up in summer, so they began going to the river below the village, the Karanj nal. A few hand pumps had been set up with government support, but the villagers did not like the taste of the water.

Water supply system

With the GV intervention, the spring on the Amar Singh Nala was tapped for piped water supply. An intake well was made and connected to a collection chamber, from which water was piped to a water collection tank in the village; a filtration chamber was built along the pipeline.

The spring source

The flow of water from the spring has decreased over time; 15 years ago there was considerable overflow, and people would pipe the water out and use it for bathing, and other needs. There used to be a rijoi tree near the spring, but someone who lived in the old settlement area near the spring, set the tree on fire while clearing the forest above, and the tree died. Thereafter the water in the spring has reduced. The reduction in water availability has affected the cropping patterns – in the fields below the spring, farmers currently sow only a single paddy crop, where earlier they had also cultivated onions in winter after the paddy harvest, but have stopped as there is not enough water.

Changes in timing

Seasonal changes are also noticed in the time taken to fill up the collection tank. In the monsoon, the tank is estimated to fill up in 4-5 hours, but in summer it could take about two days (one person estimated it was 3-4 days). For around nine months in the year, the supply is kept on all the time; but in the summer, the valve is opened from 4 am to around 6 am; there is a trickle of water throughout the day, and it is also reportedly open in the evening between 5 and 6 pm.

Finance

The VDC has two passbooks. It levies a monthly charge of ₹30 per household (based on the rate of ₹1 per day). This was introduced in September 2022, after a meeting of the VDC; initially the

charges were ₹5 per household per month, but the amounts were not collected effectively.

We were not able to see the monthly collection accounts, as the person handling them was not there. We did, however, see one list from May 2023, which listed the households as paying ₹120 each. So apparently collection had not been done for 3-4 months, and the amount was collected in one go, at a time when the villagers received some income from the sale of cashew nuts. The maintenance money is deposited in the bank account.

The corpus that was collected at the time of setting up the water system is kept in a fixed deposit; one fixed deposit was maturing for an amount of ₹2,23,913 on July 7, 2022, the other for ₹1,44,898 on October 24, 2022.

New connections

The village had 43 connections, and 4 more new ones have been sanctioned. The VDC takes ₹1,000 as a deposit for new connections, so even if an existing family decides to set up two households, the new household will have to contribute ₹1,000 to the corpus. The construction of a toilet is a prerequisite to receive a water connection, and these are currently built with government funding. The last connection was given 2-3 years ago.

One new household in the village does not have a connection – Savitri Bhuyan (No. 45), who migrated from Upper Landusahi 6-7 years ago; they draw water from the stand-post. A recent resolution was passed stating that new migrants to the village would have to make a corpus donation of ₹10,000. The reasoning behind this was that the new family would also become a stakeholder in the financial assets of the Committee – currently amounting to ₹4 lakh, which works out to approximately ₹8,000-10,000 per head. Hence from an equity point of view, the new migrant would need to contribute. On further discussion about the practicality of the resolution, it was agreed that the VDC could settle for ₹5,000 as a corpus donation if there was any discussion. However, the new household has not yet applied for a water connection, and incidentally the house is located opposite the house of the president.

Operations and maintenance

The village has an innovative mechanism to distribute responsibilities for managing the water supply and for collecting the money – they rotate these on a monthly basis. Each household is given the responsibility for a month to run the water system, to open and close the gate valves, and also collect funds from each household and hand over the collections to the president at the meeting. Typically a male member of the household undertakes these tasks. Some people may skip payments for a few months, and then pay in one cumulative amount. It was mentioned that this month's collection was to be done by Parshuram Sabar (house no. 27 in the list), next month by Sibaram Sabar (house no. 39), and the following month by the residents in house no. 24.

For major pipeline repairs, the committee typically calls a small meeting and decides to tackle it the next day. All problems are reported in the meeting.

If a tap is broken, the household is expected to buy a new tap and install it themselves or ask for help from those in the village who know how to install; there are 6-7 mistris in the village.

The storage tank and filter tank are cleaned around twice a year, typically when there is a problem in the flow of water, usually in the filter plant. The process involves removing each layer of the filter medium carefully and separately, washing the outside, and then adding it back. The layers from top to bottom are: sand, red murmu, sand, angaro (charcoal), big stones, and finally small stones.

A quick review of the bank passbook showed a deposit from the DWSM of ₹81,650 on November 2, 2009 and a withdrawal by the committee of ₹60,000 on March 31, 2010. This was for the purchase of a gate valve and for constructing a filter chamber which involved buying cement, iron rods, and rodi (stone chips) and paying the mistris. The filter tank was finished in 2010.

Control via gate valves

Initially the village water supply system had two gate valves. Three more were added for better control of the water supply in specific sections, and also to enable cut-off in supply for doing repairs, etc. It also helps to improve the supply to the lower lanes in the village where houses receive less water. Typically, the gate valves are opened only to around 50 per cent capacity to facilitate longer use and enable supply to low-pressure areas.

New repairs

The VDC plans to add a new gate valve next to the water tank (the old one had earlier been replaced by a metal valve at a cost of ₹6,400). They will not have to make a separate collection for this, and plan to buy it from the money collected for the maintenance fund.

Lesser-served areas

The houses (nos. 45 to 52) below the main road of the village have low water pressure and hence receive low supply and often no water in summer, though the additional gate valves installed help to some extent. The secretary of the VDC lives in this area and clearly voices his concerns; he is likely to raise these in the meetings as well.

New stand-post

In response to the problem of low water availability, about a year ago a stand-post was installed at a central point in the village, by taking a connection from the mainline, at an upstream point near gate valve 2 which received a trickle of water through the day. The construction was supported by donations; ₹1,000 was donated by a teacher in the village for the materials (30 feet of pipe, sockets, taps, etc.), and another family gave cement. We observed that the tap was in use virtually through the day.

Water wastage, tap repairs, closing connections

It was mentioned that 2-3 households had had their tap connections shut down by installing an end valve. The families in two households (Raghunath Sabar and Mangla Jani) were living elsewhere and had not repaired the broken taps, so to avoid wastage, end-valves were installed. A third household (Bulu Sabar) lived in the village, but had not repaired a broken tap despite warnings; they still had to pay their contribution to the maintenance fund. We asked if other villages also did this, and were told that Laxmipur reportedly closes connections if taps are not repaired. If a connection is closed, the household goes and gets their tap (such as in the case of Parsuram).

Use of toilets and bathrooms

It was felt that the use of toilets has become normalised over time and almost everyone used toilets throughout the year, even during the summer period of water scarcity. If water runs short, they get water from the hand-pump, dug-well or stand-post.

Relation with the panchayat and RWSS

As in most other villages, the government has installed hand pumps – around four have been put in over the years. There is also a bore-well in the anganwadi. The president said that the VDC has good relations with the panchayat; he attends an open house in the block on the 19th of every month to discuss issues related to the village, including people not receiving their old-age pensions.

Other community-based activities

Tala Landusahi has a good history of community-based work and has been actively involved with GV as well. They have run non-formal education classes, and undertaken a variety of land-development and income-based activities. In addition, they also collectively celebrate various festivals that revolve around the ripening, harvest or use of particular fruit and grains, which also serve as a collective decision-making mechanism to regulate the collection and use of the fruit/grain, which requires a certain amount of collective trust to implement. The following festivals were mentioned:

- **Kandal puja:** Kandal is a type of pulse, planted in summer and ready for harvest by December/January. This puja takes place before sakranti in January. After the puja there is a celebration which involves cooking the kandal and sharing it in leaf cups. Once the puja is held, the villagers are allowed to cook kandal with spices, oil, etc.
- **Ambo puja:** The date for this puja, at which mangoes are worshipped, is decided collectively by the villagers every year. As per the custom, mangoes can be plucked and eaten only after the puja.
- **Kamala puja:** This is a similar puja for oranges, generally held before Dusshera.
- **Dolo purnima /uli/holi puja:** A long-standing festival in the village. People recollect that in the past they used to make colours from banana trees during this puja.

Livelihoods

People in the village are generally dependent on agriculture and horticulture. Gaurang mentioned that he had 40 mango, kamala, and lemon trees, the fruits of which he sells in season. Krushna Bhuiyan in the village had around 40 trees bearing eight varieties of mangoes, which he also sells.

Water quality

The water quality is said to be good. It is a gravity-based system from a spring source with a filter system as well. No major issues or outbreaks of disease have been reported in recent years (as shared by an older woman).

There was an initial scoping visit in May, and a follow-up on the morning and evening of June 11, 2023. The meeting was postponed for a day as there was a marriage in the village.

Annexure 3.11.

Tarava Village, Tarava Panchayat, Gajapati District

DISTRICT
Gajapati

BLOCK
Gumma

GRAM PANCHAYAT
Tarava

VILLAGE
Tarava

Households at start of GV's work (1999)	Households at the time of survey (2018)
47	**66**

ST	SC	OBC	GEN
66	**0**	**0**	**0**

The village is said to be fairly old, around 150 years. It has seven bangshas (generations) – two Gamang, one Badaraita, three Bhuyan, and one Mandal. It has several old tamarind trees, the biggest with a girth of 25-26 feet. There is an old tradition (said to be megalithic) of erecting a stone next to the tree every time anyone in the village (who has been named) dies. Big stones and big trees were said to have spirits, and were not frequented. The village has around 50-60 acres of agricultural land and forests of around 1,000 acres.

The current generation is not interested in reading Sauran, the traditional language. Lives earlier were simpler – older people spent time in the forest and would drink. Now, they do not go much into the forest, which is full of alaoi (cashew) trees. Crops grown earlier like ganga, jauna, mandiya, borai, saraimoyi, kurui, and kambur, are not grown now. The villagers now grow mostly new varieties of paddy.

Earlier sources of water

Springs

Earlier the village used to get water from a spring. One spring in the village adjacent to the road was made into a chua (a shallow dug spring), but this was filled up after someone fell into it and drowned. After several years it was dug up again, and subsequently filled up and converted into a field for cultivation by the owner.

There is another spring adjacent to the site, also along the road, that was flowing during our visit in June, and there was a wet area around it. Its water is also used for agriculture. In a farsighted move, the land on which this spring flows was purchased by the village around 20 years ago for around ₹700; the money was pooled by community members from their work as labourers and coolies to harvest the tamarind.

Villagers also used to travel quite far to another spring in the nullah on the boundary with Gulujang village, to bathe, etc. The flow of water in both springs would decrease in summer. There is a third spring in the forested hills above the village, at a fair distance, which dries up in summer; it was subsequently connected to the water storage tank by gravity, but disconnected about 3-5 years ago, due to concerns about water quality (there were insects in the water).

Dug-wells and hand-pumps. The earliest water interventions from outside were two dug-wells – one constructed when the village was in the Kashinagar block, and the other after it was transferred to the Gumma block. Both of them are now within the school campus. The first dug-well had a water depth of around 10 feet below ground level, and was said to have a standing water column of around 10 feet. A respondent said that it is over 50 years old. Thereafter a few hand-pumps were set up by the RWSS.

Start of water supply work

The president mentioned that GV's first water intervention was in a nearby village, Buruding. A few people from Tarava went to Buruding to see the system, as they could not imagine that water flowing from a nala into a tank could be clean. However, when they visited, they saw that the water was being pumped up with a motor from a bore-well to the tank. They discussed the details when they returned to the village. Another apprehension in the early days was that GV may not stay in the village for long.

They remembered 'Gouda sir' from GV, who came to the village. Initially, meetings were held daily; one or two families were not willing to sign on to the system, and gave GV a resolution saying that they would not be able to do the work. As per the retelling, a village elder advised them at that time that it would not be prudent to stop the work; for, if they did and GV left the village, there was no surety that they could continue. Eventually they started the work, and even the reluctant families joined in. The president said he had to face angry questions from the village on why there were so many meetings, whether the water supply system would actually work, and so on, but things eventually settled down.

Current status of water supply

Water is currently sourced from three bore-wells. The primary bore-well (400 feet) is connected to the grid, a secondary bore-well (200 feet) runs on a solar-powered motor, and a third is located in the school. While the primary bore-well was set up with GV support, the secondary bore-well was dug with support from RWSS and solar panels were provided by GV. The solar panels were installed around 5-6 years ago. If there is good sunlight, then a solar-operated motor can fill the storage tank in three hours. The water storage tank has a capacity of 30,000 litres (although the sign on it says 20,000 litres).

The water level in the solar-powered bore-well was apparently 15.7 feet. There has been no change in water availability over time, with adequate water even in summer. One difference is that when this bore-well is run in summer, then a nearby hand-pump runs dry, and recovers only after about an hour or so of the pumping in the bore-well being stopped. Their main issue with the water supply are the disruptions when the motor develops a fault.

With two bore-wells, the village has a backup, and they also now have a solar system to power a second bore-well when there is electricity disruption. Faults have been developed in the motor, starter, and dibbi (electricity board) (for which they replaced the starter). The bore-well pumps have shut down 2-3 times and been replaced, and around 7-8 years ago the system was struck by lightning. But for the past 5-6 years, the motor has been working well.

The **Village Development Committee** is supposed to change its members every three years, but it has changed membership around twice in the past. The mandali also has a similar system of changing its membership every three years.

The resolution register was made available for 2023 and 2018-19. A quick review showed a variety of entries regarding the water supply system, including repair work (bore-well chamber, bore-well cover, gate valve), collection of funds (₹50 per household in November 2018 for repairs), identification of operators for the year, fixing the date of the monthly meeting day (fourth Thursday of every month, in the evening), monthly charges (₹20 per household per month in February 2019), payment of corpus funds by new users (January 2023), one-time collection for the maintenance fund (₹400 per household), and operator fees (paid in kind or with paddy). In addition there are resolutions regarding good practices – water use, cleanliness, water-level monitoring, water-quality monitoring, etc.

Water supply timing

The water supply is restricted to 30 minutes to an hour in the morning (between 5 and 6 am) and 30 minutes in the evening (between 5-6 pm), all year round. After the supply stops, the motor is started to refill the storage tank. If the tank is not fully drained, it fills in about two hours, and if fully drained, then in three hours. The rationale for choosing the timings of the water supply was mainly to conserve water; people go out during the day and sometimes leave their taps open, or let the water drain into the vegetable fields.

Operators: The committee appoints two voluntary operators from the village for the water supply system, for a year. Each operator is compensated in kind, and given three mana of rice per household (each mana is about 2-2.5 kg). A new operator is appointed around January 1 every year. The monthly electricity bill was ₹800-1,000; after the solar panels were installed, it fell to around ₹400-450. This month it is around ₹453, last month it was ₹430.

The water quality is generally fine. The villagers recalled that the pipe near the gate valve broke once and bacteria entered the water; the problem disappeared after the pipe was fixed.

The school was also given a water connection initially, which functioned for around 15 years; however, the pipe broke with children playing close by, and the school also got its own bore-well with a motor, so the connection was shut down.

The villagers felt there was no need for a filter; a recent water quality test showed no bacteria. (The iron levels were slightly elevated.)

The water storage tank is cleaned every 2-3 months, maybe about 5-6 times a year. They mentioned that the tank should not be cleaned too often or too vigorously, as the cement plaster inside the tank may erode. The tank was repaired once, when it developed a leak; around ten bags of cement were used to plaster it both inside and out.

Finances

Each household contributes ₹20 per month to the maintenance fund. One-time collections are also carried out episodically to cover lumpy expenses. The money is collected at the monthly meetings, and not done door-to-door. Typically, people contribute ₹240 for the entire year in one go. Accurate records are kept of the funds paid by each household, which are recorded annually. About three households have not been paying for the last few years. A review of the books showed that six people did not pay in 2021, and about 15 in 2022. Between 2020 and 2021, there was a collection of ₹50 from virtually everyone for the electric panel which broke down.

The village has an interesting approach to raising funds – they volunteer their labour; for e.g., they collectively apply for a labour contract, and the wages paid for the assignment are donated for community purposes. In this way, the residents do not face a direct cash demand. They typically get paid ₹250-300 per day working on such contracts; in the past they worked at a brick kiln and were paid ₹10,000 for making 20,000 bricks. The money collected is kept for collective use. At present, there is a balance of ₹6,000-7,000 in the maintenance fund.

About two years ago, the electric meter box developed a fault. The villagers went to the Junior Engineer, who asked them to pay an average rate bill. They spent ₹24,000 in all to pay the bill and fix the meter.

There was discussion at the last meeting about collecting a one-time amount of ₹400 per household for future maintenance.

Piped water connections

Initially the village had 45 connections. One person shifted out and went to the IA colony. In the last 20 years, the growth in water connections has been limited; only 6-7 households have been given connections. New connections typically happen when a brother moves out and builds a new house (as in the case of Polikar Bhuyan, Tiyapil, Sanjay Gamang, Sardun Gamang, Anesimon Gamang, and Ruday Gamang). They make their own toilets and bathrooms, although the committee does not insist on this as a pre-requisite for being linked to the water supply; neither do they insist on pre-payment of the corpus contribution of ₹1,000; they have given connections to people who have not paid yet. Kimon, Gopi, and Tadiash do not have connections yet; Kimon's wife is in the VDC committee.

Repair

If a tap breaks, people either replace or fix it themselves, or take help from 1-2 skilled people in the village. Jisay Bhuyan, who was present at the meeting, is said to be the go-to person for fixing taps and new connections, as well as for repairs in the pipeline. People said that he does not charge for doing this work in the village.

Government support

The main support received from the RWSS has been the hand-pumps, bore-well and motor on which the solar panels were installed. The bore-well and motor in the school were also given by RWSS. The block had provided the two dug-wells in the early interventions.

The current panchayat sarpanch is from Golujang village; the seat is reserved for women. There are two panchayat wards in Tarava, also represented by women. The main support from the panchayat is via NREGA, for work activities like road work, building a guard wall in the fields, pokhari rejuvenation, land development, soak pits, and clearing/levelling land.

Future ideas

The villagers said that if they received support from the government or any other source, they would clean and repair the older spring in the hill, put in a filter pit to improve the water quality, and then connect this gravity-fed source to the storage tank. For the existing chua (shallow spring) along the roadside, they planned to make it pucca and start water supply to the village via a standpipe, etc.

Distribution of water

One set of households has low pressure in its pipeline and receives less water; the water reaches them only after the pipe fills up, and supply stops once the main valve is closed. They depend on the hand-pump to supplement their use.

History of collective work

The village has a mandali (a meeting hall) which they built about 20 years ago with community labour. For the cash component, they donated their wages from working as labour elsewhere. Some people who could not work gave cash. They maintain a chart to keep track of who has made labour contributions.

Influence

People have visited from Jazpur and Jaipur in Orissa, and also gone as far as Jharkhand to see how other villages work. Nearby villages who have visited and subsequently set up water supply later include Golujang, Patipul, Linga, and Engarda (which are mostly tribal Soura villages). The water supply system has spread a lot in villages like Asharygada, which have non-tribal populations.

Toilets, bathrooms, sanitation and marriage

Most marriages are arranged by the boy's family asking for the bride. Mandali office bearers are involved and play an important role, as the girl's family enquire about the antecedents of the boy involved. Apparently, in the last few years, the presence of a toilet, bathroom and water supply has become an important feature before the marriage is agreed to by the girl's family. Toilet-use has become normalised over time, as there is no scarcity of water even in the summer months.

Self-Help Groups

The village has four SHGs, one of which is the Siva Sakti Mahila Swai group. We met Kalyani Gamang from the group; she is the master book-keeper. With support from the Orissa Livelihood Mission (OLM), the group has set up a mushroom-growing shed with a green perforated sheet, and they grow two types of mushroom – padachatu (which grows in the monsoon and fetches ₹200 a kg in the village), and dingrichatu (which grows in winter and is priced at ₹150 per kg in the village). Other groups undertake chicken-rearing, paper plate-making, and cooking mid-day meals (MDM), and rent out large utensils for events (mostly with OLM/ITDA support).

The family of Kalyani (and Prakash) Gamang has kept around 20 honey boxes this year, with support from the Agricultural Department. They got the boxes from Puri and are expecting up to five litres of honey per box. Around 6-7 communities of bees left the boxes. The family was offered advance payments by villagers, but they have not accepted as they expect to sell directly in the market, possibly at the rate of ₹400 per litre.

Prakash mentioned that he worked as a water supply operator many years ago, and used to clean the tanks very frequently, once every week or two weeks. Kalyani said she had also cleaned the tanks in her maternal village.

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