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Learning from Water, Sanitation and Hygiene in the Thar Desert (WSHT) Project



charity: water



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Author's Note

Water scarcity is increasingly becoming a global problem and across all continents a large number of people are living with inadequate quantities of safe and clean water. Global community is concerned about the access of people to safe and clean drinking water, and water for sanitation. As access to water is one of the key determinants of physical health and wellbeing, policy makers, civil society actors and governments have drawn towards finding solutions to the problem of people especially in water starved geographies. Communities in rural areas of dry and arid regions of Western Rajasthan, India brave droughts or drought like situations almost every passing year. It is very much in the interest of all those involved in finding solutions to similar problems across different regions, to learn from the experiences of Gramin Vikas Vigyan Samiti (GRAVIS), an NGO working in the region for the past almost four decades now. Drought resilience model of GRAVIS have been intertwined with goal of ensuring clean and safe drinking water, making water available for other human and cattle needs and thereby ensuring good health and wellbeing for them, through Water, Sanitation and Health in the Thar (WSHT) project implemented by GRAVIS with support of Charity : Water.

Documenting the contours and the takeaways from WSHT project reinforced the people centric approach adopted by GRAVIS since beginning. Revival of desert life through provision of rainwater harvesting structures such as taankas and renovation of village ponds, has propelled the movement of these traditional societies in the process of transition towards wellbeing and water and food security. Provision of Biosand water Filters, complemented by training and orientations sessions have resulted in improved health, and technical trainings have built capacities to maintain and service rainwater harvesting structures, ensuring year round supply of water for the remotest villages in the Thar Desert. Success of all the interventions rides on the bottom up approach that WSHT adopts and centrality of the community aspiration and resources that fortify the movement from deprivation to development. The project, in addition to establishing the effectiveness and relevance of traditional means of water conservation, reinforces the belief in integrated community development approach and the need for strengthening local democratic structures.

Author is immensely grateful to the desert communities whose collective wisdom continues to inspire the drought mitigation and water security endeavours of GRAVIS and the likes and expresses her gratitude to the team at GRAVIS who extended all their support in collating and documenting the project learnings

Neetu Sharma, PhD



Introduction

Today, 2.4 billion people live in water-stressed countries, 420 million people still practise open defecation, and millions of women and girls spend hours every day fetching water. The message is clear. We must change course to achieve universal access to water and sanitation¹. As the water crisis looms over all the parts of the world for drought prone regions, this crisis is more belligerent than ever. Water is scarce not only for basic human needs such as bathing, cleaning, washing etc, clean water is absolutely unavailable for drinking, which is a cause of even greater worry. With unregulated and unlimited extraction of ground water on one hand and environmental pollution quality is getting declined and contamination is creasing. Climate change also affects water quality, posing additional risks to drinking water quality and human health. Higher water temperatures, and an increase in droughts with lower stream flows, will adversely affect water quality due to pesticides, pathogens, sediments, dissolved organic carbon, and thermal pollution².



A village in Thar Desert

1. Blueprint for Acceleration: Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2023, <https://hlpf.un.org/sites/default/files/vnrs/2023/2023%20UN%20Water%20SDG%206%20Synthesis%20Report.pdf>
2. Chapter 4 Observed Changes in Water Quality, IPCC Sixth Assessment Report: IMPact, Adaptation and Vulnerability, 2022 <https://www.ipcc.ch/report/ar6/wg2/chapter/chapter-4/>



Thar Desert region of western Rajasthan is inarguably one of the most dry regions of the world which is afflicted with acute water shortage both for human and cattle needs. The Thar Desert is undoubtedly the most inhospitable ecoregion in the Indo-Pacific region; yet still, it supports a human population density of over 80 people per square kilometer, making it the most densely populated desert in the world. In addition to humans, a significant proportion of livestock inhabits these regions. Rajasthan, with the majority of its portion covered by Desert accounts for 57 million livestock, which is lifeline for rural desert communities, and holds second rank in livestock population in the country³. Shortage of water for farming, human need and for cattle has a catastrophic impact on the lives of people in this region. Water scarcity affects agriculture and cattle rearing, that are primary vocations, poses hygiene, sanitation, nutrition and eventually health related issues for people. Women, children and older people are most affected in terms of the health impact of water scarcity and poor water quality.

Gramin Vikas Vigyan Samiti (GRAVIS)' work on drought mitigation surrounds enhancing peoples' capacity to access safe water around the year. With an overall outreach of about 9000 people, GRAVIS has been supporting the communities through construction of household and community level rainwater harvesting (RWH) structures and requisite know-how in terms of water conservation, health and technical aspects of maintaining various RWH structures. The project, namely, Water, Sanitation and Health in the Thar Desert (WSHT), was a continuation in the direction of ensuring improved water, sanitation, hygiene and health facilities for the people living in rural and difficult to reach remote areas of the Thar Desert in India.

Water, Sanitation and Health in Thar (WSHT): a Project by GRAVIS

Need for specific focus on water, sanitation, hygiene and health demanded targeted interventions in this area. Having recognised this, GRAVIS implemented the WSHT project in 20 villages of Jaisalmer and Jodhpur districts of Western Rajasthan, India with the support of Charity Water

Specific Objectives of the project are:

- Creation of rainwater harvesting storage structures at household and community levels
- Ensure water quality through filters and testing
- Enhance community capacities on water conservation, water quality, sanitation and hygiene
- Improving health and hygiene status
- Data collection, documentation to use for replication advocacy

3. 20th Livestock Census of Rajasthan, 2019, <https://animalhusbandry.rajasthan.gov.in/>



In order to achieve the above objectives, a number of direct interventions were planned. Some of the most important activities were as follows:

- | | |
|--|-------|
| - Construction of drinking water storage tanks (taankas ⁴) | - 432 |
| - Renovation of percolation wells (beries) | - 20 |
| - Installation of Bio Sand Water Filters (BSWFs) | - 432 |
| - Setting up Village Development Committees (VDCs) and their trainings | - 40 |
| - Water and sanitation trainings for the community | - 40 |
| - World water day events | - 02 |



Woman fetching water

The project envisaged fully functional water tanks to meet water needs of families round the year, and cleaned and renovated percolation wells that provide storage of water up to 150,000 litres and recharged on its own, perennially lasting for several years. In addition to the availability of water, the WSHT project looked at the problem of quality of water too and provided BSWF to targeted populations to ensure availability of clean and safe drinking water to them. Finally, with a view to sustain the impact of the interventions, a range of technical and conceptual trainings were conducted as part of the project that have an empowering impact on the community. With a view to assess the impact of all the interventions that were part of WSHT project, a study was undertaken with samples drawn from both Jaisalmer and Jodhpur village. A total number of 100 direct beneficiaries, key informants including community leaders and project staff working on the WSHT project were interviewed to gather and glean the learning from the implementation of the project.

4. Taankas are household level rainwater harvesting structures that have capacity of holding 20-30,000 litres of water. Taankas get filled up during rainy seasons and once filled up serve household needs for water for drinking, cooking, washing, cleaning, bathing and other household purposes, for atleast 6 months



Chapter 1 Reviving the Lifeline: Making water available

The state of Rajasthan is known as the desert state of India because of the Thar Desert that envelops a significant part of the state. Jaisalmer and Jodhpur are two of the most affected administrative districts of the state. Rural populations in both the districts make their living from farming and other related activities such as livestock grazing. This is in spite of the fact that these regions received minimal and scanty rainfalls, have no irrigation facilities and even ground water resources are not only limited but are depleting at a much faster pace than anytime. Contamination of available water resources further aggravates this crisis, and eventually leads to severe implications for food production, availability of drinking water, and for other household purposes such as cooking, washing, cleaning and sanitation, etc. making water available to water starved communities in the rural areas of the Thar Desert has always been at the epicentre of GRAVIS' interventions aimed at water, food and nutrition security. Over a period of almost three decades now, GRAVIS has been in arduously engaged in finding and executing the most efficient strategies to resolve the water crisis in the region, and has innovated several sustainable measures that enhance efficient use of water and making it count for improved food security, nutrition and health for the communities in this region. Droughts are common and so are the struggles of communities to maintain good hygiene, and sanitation facilities, along with nutrition and health. GRAVIS' interventions create a water secure ecosystem for these communities, thereby improving their quality of life over a period of time.

As water resources are scarce all over the world, harvesting and managing of water in a judicious way has come to be accepted as the most pragmatic strategy to achieve water security for water insecure communities. With climate changes posing the problems of uncertainty of rains along with the existing acute water shortage in the Thar region, collection of rainwater, managing it well and utilising it for various human and cattle needs, have been recognised as the scientific solutions to the water crisis in the region. Adopting a holistic approach and all encompassing set of interventions, GRAVIS enabled construction of a range of rainwater harvesting structures in the two districts of Rajasthan through WSHT project, towards the aim of addressing a wide range of water needs of the community. By mid 2023, over a period of two years GRAVIS, as part of the WSHT project, had constructed 432 structures for harvesting of rainwater that benefited 3000 people in two districts most affected by prolonged droughts

Table 1 - Overview of rainwater harvesting structures constructed through WSHT project

Sn.	Interventions	Numbers	Beneficiaries		
			Males	Females	Total
1	Taanka	432	1200	1800	3000
2	Bio Sand Water Filters	432	1200	1800	3000
3	Beri	20	60	80	140

As mentioned in the table, another 3000 people were impacted through the BSWFs and a similar number of people benefited from renovations of percolation wells.



1.1 Household level water security and its outcomes

The state of Rajasthan in western India is the most water deficient state of India. More than 30 districts, i.e., the administrative units, out of the total of 50 reel under water scarcity on a regular basis. Rural and remote areas of Jaisalmer and Jodhpur districts face recurrent droughts and drought- like situations triggering severe drinking water crises for the populations inhabited in these villages. For most households, drinking water sources are located at the distance of 6-8 kilometres everyday, and as in the case of the rest of the developing regions facing water shortage, the burden of providing for water needs of the families falls disproportionately on women and young girls. On an average a woman spends about 4-6 hours everyday collecting water. Engagement of women and young girls in water collection deprives them from leading a normal life in which they can engage in self development, self-reliance activities or socialisation. A region that is marred with regressive gender norms, water scarcity contributes to women and young girls woes. School education of young girls keeps getting affected because of water fetching duties, most girls are not able to attend school regularly, and even when they do, time for studies at home is not available to them. In such a situation most girls keep dropping out of education, creating a cycle of low level of education, lack of exposure and opportunities, and consequent subjugation of women in the family and society. Most women do not own any assets making them further vulnerable to financial shocks and increasing their dependence on males in the family.

On the other hand, if women and girls do not engage in water collection for the family, the household finds itself in unmet needs in terms of drinking water and water for other purposes such as cleaning, cooking, and bathing and sanitation. As the project villages are located at long distances with no means of comfortable and inexpensive transport available in their area, public water services through piped water also elude them. None of the households in the villages covered under WSHT project have access to water supply through pipelines. When the water crisis worsens, communities in three regions are forced to adopt unsustainable measures such as extraction of groundwater, which is expensive as well as unsustainable. With a view to ameliorate the water scarcity at the household level, GRAVIS facilitated construction of 432.taankas in 20 identified villages of Jaisalmer and Jodhpur, reaching out to a cumulative population of 3000 of which half of them were women and girls.

For women and young girls, however, alleviation of their labour and reduction in time spent on water fetching are two most cardinal outcomes of having a taanka. Most women and young girls were happy to spend their time now on social and educational activities. Many women could participate in the meetings and training organised by GRAVIS mainly because they were let off their water fetching role. As shown in the table and figure below, 36% women reported that they were spending 3-4 hours everyday in fetching water, 28% were spending 1-2 hours and rest 18% each were spending either 2-3 or 4-5 hours per day, time that is being saved now, credits to tanks constriction at their houses.

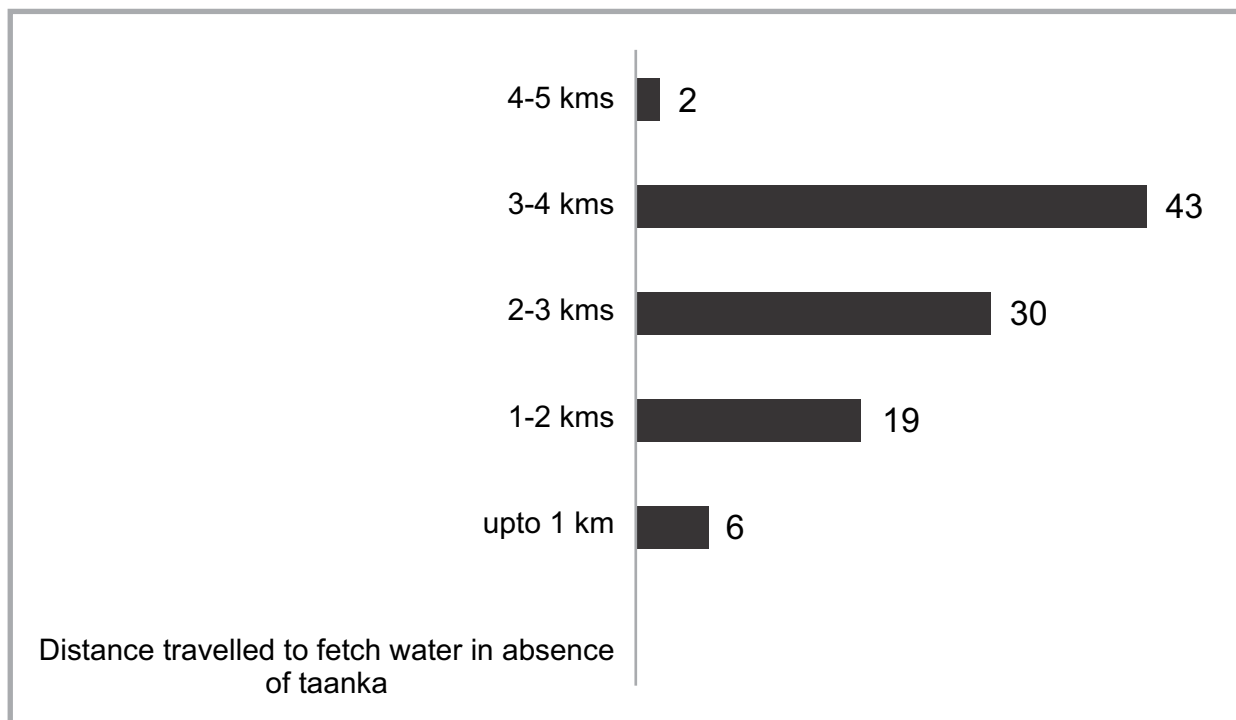


Figure 1 - Time saved from water collection



A significant amount of excruciating walk was also saved for women, as shown in the table and figures below

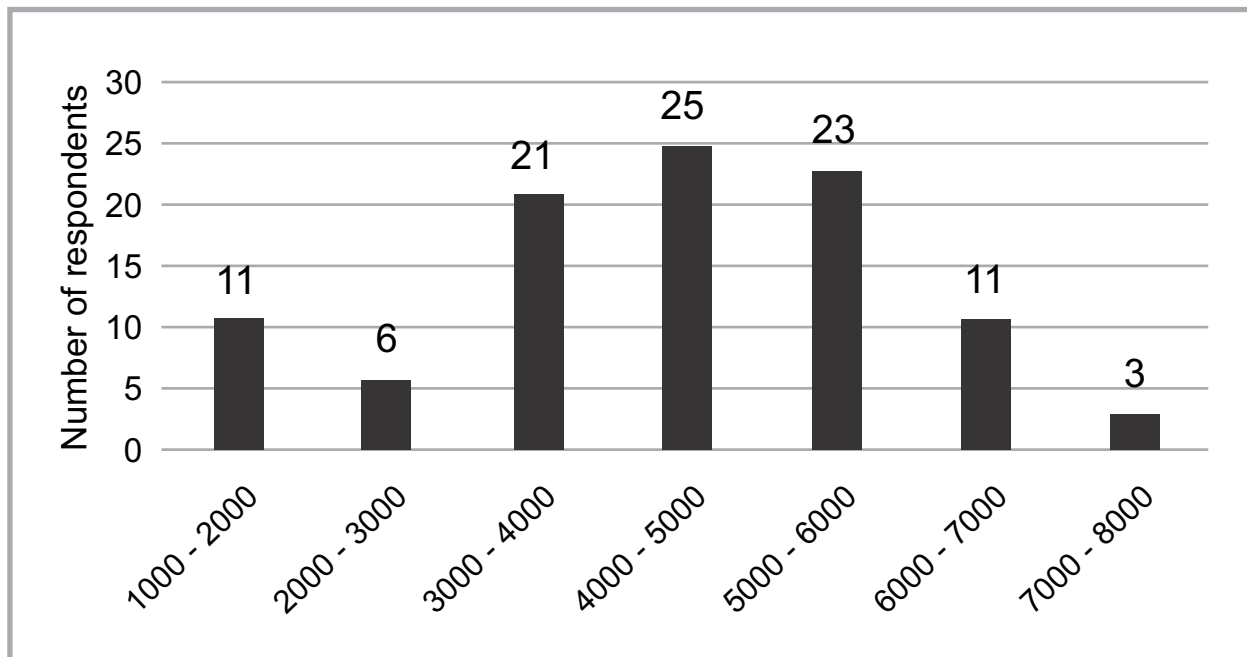
Figure 2 - Distance travelled to fetch water in absence of *taanka*





Water from taankas are used by all the beneficiaries for drinking, cooking, cleaning and bathing too. 45% of the beneficiaries mentioned that maintaining hygiene and taking bath regularly was difficult especially during the dry seasons, as water was never enough even for other crucial needs such as drinking, cooking etc. Some of them (12%) are able to secure some water for their cattle too. All the beneficiaries reported an improvement in hygiene status of the family and consequently reduction in the episodes of waterborne illnesses, especially among children. For all the taanka beneficiaries, sources of water in the past were village ponds and small limited capacity tanks that they used to keep at home. Quality of pond water remains a matter of concern as water stagnates. Salinity and dust in pond water also make them unsafe for drinking. Water may also get contaminated during the process of transportation and storage. Storing it in an unscientific way and inability to keep the water at home covered all the time also affect the quality of water making it unsafe for drinking directly. Taanka enables year round provision of fresh water for people and helps them not only consume clean water for drinking but also for cooking and other purposes. Design of taanka that is augmented for greater efficacy in terms of ensuring cleanliness of water that goes in the tank makes it an extremely useful and safe source of water, as against other sources such as village ponds.

Figure 3 – Money saved annually due to construction of *taanka* (INR)



Availability of water through taankas has a visible and immediate impact on the health status of people. While there is an evident decrease in the number of children falling sick in the project villages, it was also reported that other ailments such as skin rashes or allergies, stomach related issues such as diarrhoea and vomiting, and other issues such as abdominal pain, stomach infections, cough and even seasonal fever, have also substantially reduced. All taanka beneficiaries believe that this improvement in the health status of people is directly attributable to the availability of clean and safe drinking water and their enhanced ability to maintain personal hygiene even during droughts, due to construction of taankas.



Impact of construction of taanka within the premises is visible through improved health status of women and young girls as well. In addition to availability of clean and safe drinking water, women and young girls' freedom from everyday toil of walking long distances carrying water pitchers on their heads, has provided them much needed relief. Women used to complain of headaches, knee and back pain, breathlessness especially during peak summers, weakness and physical exhaustion most of the time. As they no longer need to spend time and energy in water collection, women and girls feel much rested and healthier. They are also able to maintain better menstrual hygiene with water made available at the doorstep. 65% women reported a decrease in infections caused due to lack of hygiene.

Taankas transform lives



A few miles away and a long walk from the centre of the village cluster, a block, takes us to Kamla Devi's home. Kamla Devi's and her daughters offer a welcoming smile before they get back to their studies and start preparing for school the next day. Kamla Devi's family situation was different about a year ago. She and her daughters used to travel 3 miles everyday to reach the water source and fetch water from there. This distance used to increase during the distress period as many water sources used to get parched. 4-6 months in a year the family had to spend Rs 1500 to 3000 each month and buy water to meet household needs. Kamla Devi's and her daughters used to spend a cumulative duration of 10-12 hours everyday to meet water needs of the family. J was always exhausted and could not engage in any social activities. Her



daughters had to miss school every other day and they could not concentrate on their studies at home either. Despite this, the quantity of water that they could carry was limited and was barely sufficient for drinking, cooking and most critical needs. They could neither have enough water for everyone to bathe, clean or for sanitation purposes.

In one of the meetings attended by her husband on the importance of clean water and hygiene, Kamla Devi's husband came to know about the possibility of getting a *taanka* constructed at her house, he immediately approached the VDC with the same request. Considering the financial situation of the family, VDC approved the construction of *taanka* at Kamla Devi's house. "It seems like a different phase of our lives, I no longer worry about water at the break of dawn, my daughters spend their mornings preparing for school and study in the evening too. Water from *taanka* is fresh and tastier than the water we used to bring from the pond. With just one or two rains, *taanka* got filled with water and we had sufficient water until summer. We use water for drinking, cooking, cleaning and washing and if its sufficient, its used for cattle too." Kamla Devi says.

Having a *taanka* at home has transformed the lifestyle of the family, not only because of the enhanced ability to maintain hygiene and cleanliness and follow good practices, household expenditure on water is also being saved. The family is now saving about Rs 6000 to 8000 in a year. With improved hygiene and availability of year round water, the health of family members is improving. Kamla Devi's daughters are doing well in their studies and Kamla Devi has started attending community meetings and trainings, which was not possible earlier. 'All families in the desert should have a *taanka* at their home. Taankas have a transformative impact on our lives and with each household having a *taanka* the whole desert community will prosper.' Kamla Devi signs off.



Taankas have addressed most of the water related needs of families and improved hygiene and cleanliness, and consequently general health and wellbeing in the families. As children, women, older people and others are not falling ill very often, they have reduced expenses on healthcare too. Women are saving not only their labour but also a substantial amount of their time that is now being diverted to self care and self development activities.



A new taanka

Improved educational opportunity for young girls is another crucial outcome of the *taanka* construction, which will potentially lead to creation of an educated and empowered group of women within a few years, and eventually a community with enhanced gender balance. All beneficiaries found *taanka* to be a life changing element in their lives and recommended that all households in the entire Thar Desert should have a *taanka* at their homes.

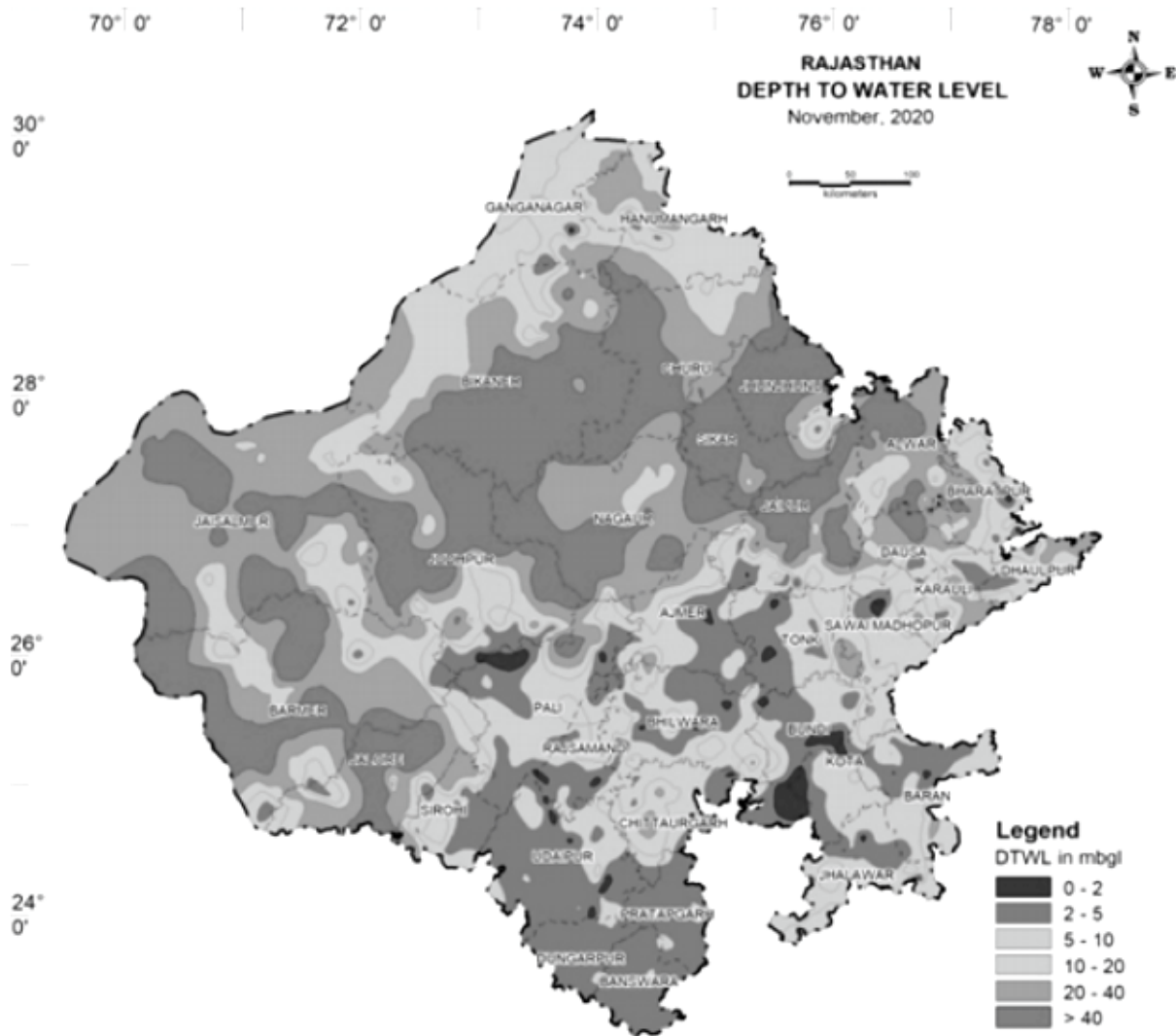
1.2 Safe Drinking Water - a boon for improved health

Safe drinking water is the lifeline for humanity. In drought affected regions, scarcity of water for any household purpose makes it difficult for people to even think about its quality. When the rainfall is scant and negligible, availability of water itself becomes a luxury. In such situations, drought affected communities do not afford to consider quality of water before consuming it. The state of Rajasthan, while being one of the most water scarce states of India, also faces the problem of groundwater contamination. Groundwater table in every fifth well (20%) in the state has gone below the alarming level of 40 metres, making it largely unfit for drinking as water below 40 metres⁵ contains sulphur, chlorine and fluoride more than the permissible limits posing health hazards when consumed regularly. It is even more worrisome that this proportion rose to 40% (wells with alarmingly low levels) by 2020.

5. Groundwater Year Book 2020-21, Rajasthan, Central Ground Water Board, Department of Water Resources, River Development & Ganga Rejuvenation Ministry of Jal Shakti, available on: <http://cgwb.gov.in/Regions/WR/Reports/GW%20Year%20Book%202020-21-Rajasthan.pdf>



Rajasthan - Depth to Water Level

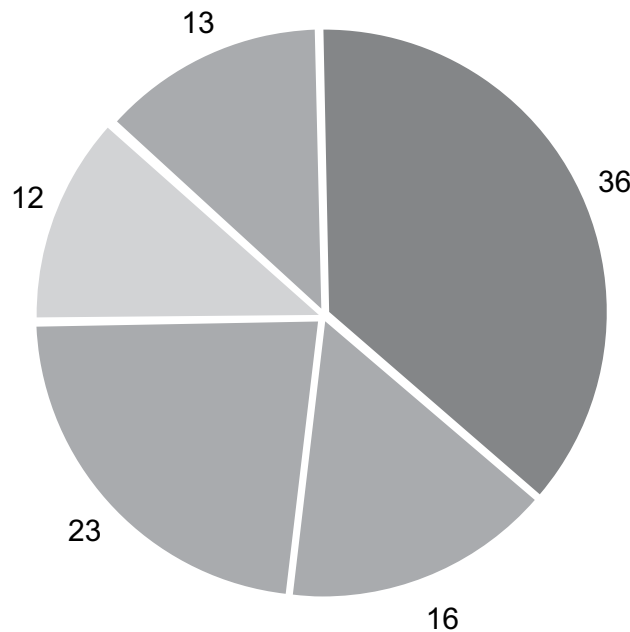


Source: *Groundwater Year Book 2020-21, Rajasthan, Central Ground Water Board, Department of Water Resources, River Development & Ganga Rejuvenation Ministry of Jal Shakti*

As shown in figure above Jaisalmer and Jodhpur fall in the category of regions having the lowest levels of groundwater in the state, which means that most of the groundwater available in these districts is not suitable for drinking without adequate treatment. The problems get further magnified with the absence of piped water facilities in agristic and far off areas of these districts where the WSHT project was being implemented by GRAVIS. Communities in these regions have no choice but to collect drinking water from village ponds, which is most often loaded with contaminants such as fluoride and other impurities. Some families were using the traditional methods of cleaning the water to make it drinkable but most of them were ineffective.



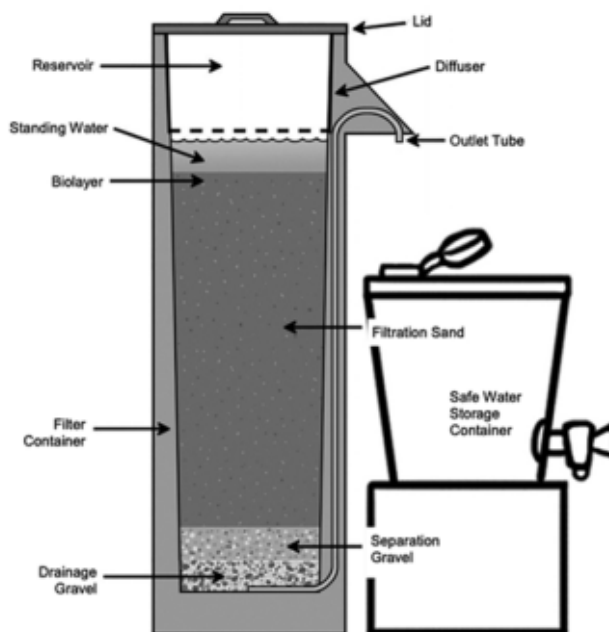
Figure 4 – Methods being used for cleaning water previously



- Use of alum
- Use of bleaching powder
- Filtering with cloth
- Sedimentation
- No cleaning

During the WSHT project, GRAVIS provided Bio Sand Water Filters (BSWF) to ...families to address the problem of availability of safe and clean drinking water. These BSWF is a household level simple water cleaning device that uses a traditional method of slow sand filtering to clean the water. BSWF, which uses sands as the most important component of filtering process has the capacity to remove 98% of impurities from the water including pathogens and dust particles making it safe from drinking.

The parts of BSWF



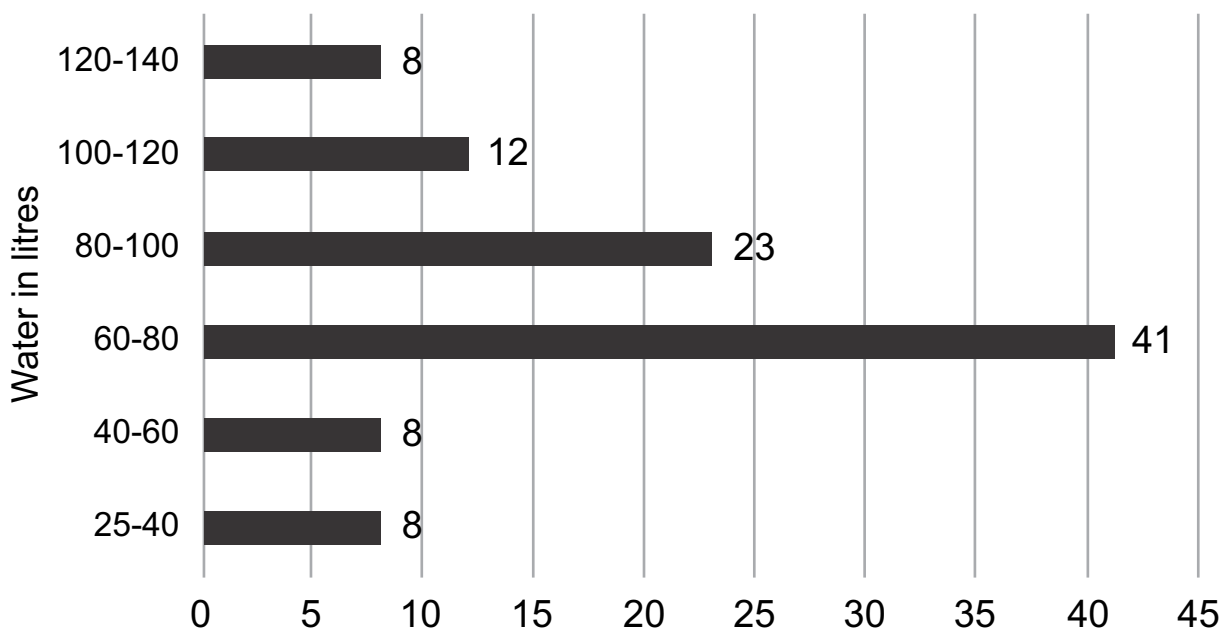
CAWST (2012). Biosand filter construction manual. Calgary, Alberta: Centre for Affordable Water and Sanitation Technology.



As shown in the figure, gravel and sand are used for the filtration process to make water clean and ready to drink directly from the storage tank. Water is poured over from the top and with a slow filtration process it keeps getting accumulated in the safe water storage container. Considering that these BSFs are made from the locally available material and simple techniques, these can be made available to people at low cost and others can afford to buy them too. As it is an economical device with significant level of efficiency, these are most suitable in the rural settings. As compared to other devices, BSFs are also more useful for communities in drought affected rural areas as these do not require electricity and are based on the principle of zero wastage of water. Considering its efficacy and the need in the region for water purification devices at the household level, GRAVIS has installed BSWF in ...houses and ensured availability of clean and safe drinking water for their families.

All the users of the BSWF who were interviewed to assess the impact and utility of BSWF felt that water that they get now is much cleaner than before. 67% of the beneficiaries said that water used to look hazy, 43% mentioned having noticed algae, and 34% said that there used to be some sort of mell too in water, when they were not using BSF. 87% beneficiaries particularly mentioned reduced salinity of water making it tastier and sweeter than before.

Figure 5 – Use of water from BSWF



Depending upon the needs of the households, families were using 60 to 100 litres average as a median value, with 25-40 litres being lowest with 8 respondents reporting the same and 120 to 140 litres reported by another set of 8 respondents. 41% respondents reported that they use about 60-80 litres of water every year from BSWF, for 23% respondents this quantity was 80 to 100 litres and for another 12% it was 100-120 litres. It was noticed that two factors clearly determined the usage of water from BSWF, one - the



number of people in the family and the level of awareness and capacities on use of clean water and maintenance of BSWF. Households with a higher number of family members recorded a higher quantity of usage. GRAVIS also conducted awareness sessions on the importance of use of clean water for drinking, as well as training sessions on maintenance of BSWFs. With increased awareness and capacity usage of BSWF in terms of water use keeps going up.

All the beneficiaries felt that use of BSWF is more effective than other water traditional water purifying methods that they used to adopt in the past. They also felt that consumption of clean water has resulted in better health - reduced stomach infections, reduced episodes of other water borne diseases and other illnesses such as vomiting and diarrhoea, etc. In addition to the health benefits, some beneficiaries (about 16%) also reported to have saved the amount that they used to spend on other cleaning methods. However, most of them (78%) felt that the positive impact on health is the primary reason for financial savings.

Clean water for well-being



“Construction of *taanka* has helped us maintain cleanliness at home. The silt catcher is an effective tool to prevent dirt and other unwanted particles going inside the tank, which assures that we have clean water available for all daily use. Water that we used to carry from the pond in the other village was always hazy and dirty. I wish we had got *taanka* constructed earlier, that would have saved me from carrying water from a distance of 4 kilometres everyday. Availability of clean water has helped me ensure maintaining hygiene at home too. Children can bathe everyday and I can keep them clean always. The effect of that can be seen on the health too. They do not fall sick very often now.” Says Jamila (Rin), who lives with a family of seven people, including her husband, in-laws and children.



There are a lot more reasons that make Jamila happy about having a *taanka* at home. She continues, “I used to feel exhausted all the time and never had a moment of rest. My entire life revolved around fetching water and doing household chores. I thought I would always have to live with back pain. Since *taanka* got filled up last rainy season, I never had to worry about water. I have sufficient time during the day to do household work, take care of my elderly parents in law, chat with my kids, and even attend trainings. I still feel full of energy and have got relief from back pain.”

There are more than 400 women like Jamila in Jaisalmer and Jodhpur districts who are enjoying the benefits of a *taanka* in the form of improved sanitation, hygiene and health for themselves and their families. Water and sanitation related trainings have helped them utilise *taankas* more effectively and they are become agents of change with their families for promoting good hygiene and sanitation practices.

About 91% of beneficiaries had received training on using and maintaining BSWF as well, although some of them could not participate because of their other engagements. All those who had attended the training found the training useful. They found the demonstration on how a BSWF is made quite interesting and came to know how and how often a BSWF needs to be serviced. None of them reported any difficulty in using the BSWF and all of them said that they would recommend use of BSWF for everyone in the area considering the low maintenance and effectiveness.



A BSWF in use



Use of BSWFs by the rural community is a matter of awareness and behavioural change, as much as it's a matter of affordability. GRAVIS' efforts to integrate the provision of BSWF with trainings has led to acceptance and active demand among rural households. BSWFs are slowly becoming a matter of pride for them as rural families love to serve clean water to visitors. Health benefits of BSWF are scientifically proven and its simple technique and use of local raw materials make it the most sustainable and effective water purifying option for rural communities.

1.3 Water for other human and cattle leading to improved nutrition and financial gains

Beris are essentially self percolating ellipsoidal wells that are common community water resources. Water from beris is used by rural desert communities for a wide range of purposes such as washing, cleaning, cattle and at times horticulture too. However, during the time of distress desert communities may turn to beris for even drinking water needs as well. Interestingly, the Beris are named after the person who constructed them. Generations have passed, and the name of these wells remains the same. These beris quench the thirst of hundreds of people. In addition to humans, water from these beris is available for the animals and livestock as well. The animals outnumber humans in Jaisalmer and during hot summer days, these wells act as life savers for them. A large community-owned beris / reservoir can hold more than 400,000 cu litres, and a smaller one about 100,000 cubic litres. This capacity is sufficient to keep 4-5 families drinking water for several months. Beris are found in impermeable rock areas and are lined with naturally occurring clay. Most beris have not been maintained for many years and have silted up. Desilting involves the community working together to remove all the silt, and then constructing a concrete 'cap' access area and hatch. With the focus shifting towards government provided water supply, the upkeep of beris has suffered. A number of beris have been allowed to silt up. GRAVIS motivates the communities to revert to traditional self-reliant methods of water harvesting, desilt these ponds and restore them to their original capacity. Desilting leads to an increase in capacity (water stored) and also percolation, making the beris more useful for years to come.

Under the aegis of WSHT project, GRAVIS has undertaken the work of renovating 20 beris in Jaisalmer and Jodhpur districts. This involved removing silt from the pond bed, leading to increased storage, and wherever needed repair of embankment where it has been breached and plantation and earthwork in the catchment to stabilize it and reduce soil erosion.

Renovation of 20 percolation wells have resulted assured availability of water for many years to come, as once cleaned and desilted these percolation wells keep getting recharged with water around the rainy season and hold substantial quantity of water

With cleaning and desilting work undertaken, percolation wells are back to their original capacity. Each well can hold 150,000 litres of water that can cater to the needs of 6000 humans and 8000 cattle population in the region. Hence, 20 beris have become a major source of water for household use and for their livestock for 600 households in the 20 villages where WSHT project is being implemented. As livestock is a one of the



major sources of livelihood for farming communities in these areas, availability of beris water has come to be the most affordable and accessible resource for them. With enhanced availability of water, dairy production has improved and they have better access to nutrition. Most villagers are also engaged in selling dairy products that fetches them an additional income.

In the absence of availability of water from the percolation well, most families used to travel much longer distances to reach a water source to meet their water related needs. 35% of the people when asked about the quality of water from renovated percolation wells responded that water from desilted percolation is much cleaner, especially as compared to what they were bound to use earlier. They felt that the water from desilted percolation wells could also be used for drinking after adequate cleaning through BSWF. 93% of the respondents were also of the view that the water from other sources was never sufficient for them and their cattle, and they always needed to make compromises on either hygiene, general cleanliness or water for cattle. As these percolation wells are closer to their homes, women and giles are saving extra time having to travel a longer distance. It is noteworthy that most of the percolation wells are located very close to the hamlets, reducing the travel distance to a maximum of 200 to 300 metres for all households who fetch water from there.

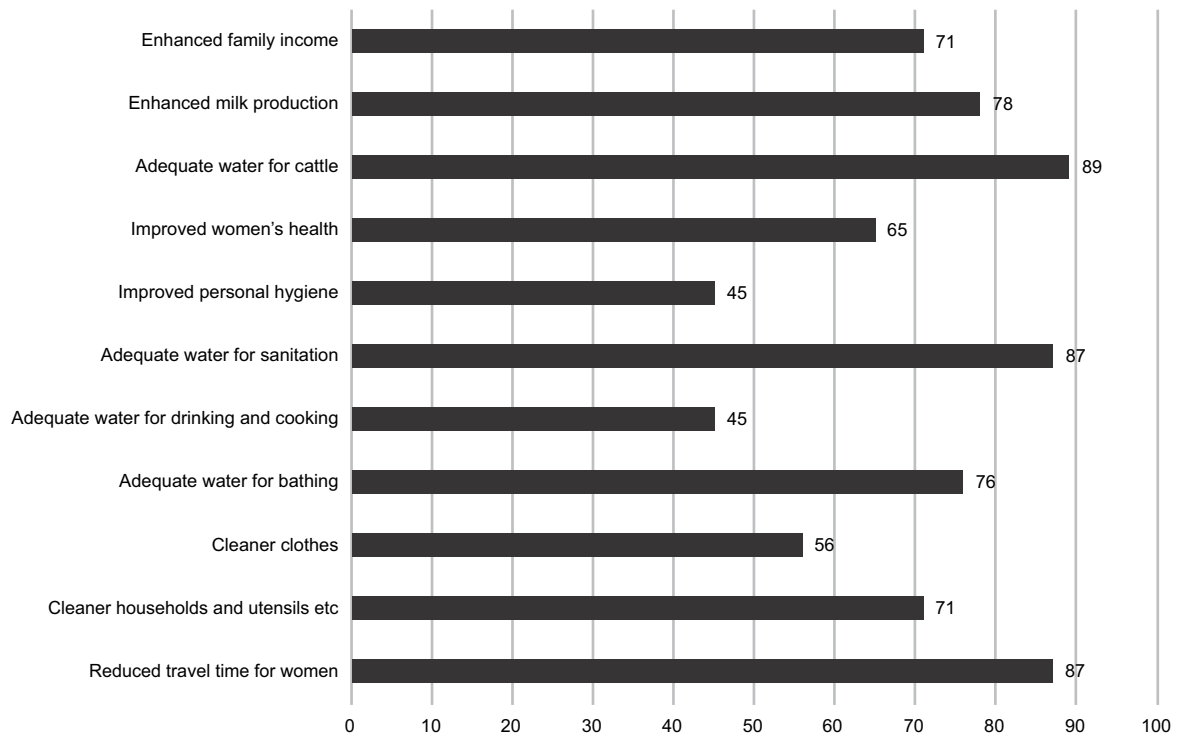


A Beri in use



Although the rural population adopts several coping strategies to cope with water strategies, not all of them are adequate in terms of their effectiveness and outcomes. It was reported that many households in the 20 identified villages used to use ash to clean utensils, many of them were not washing their clothes for many days and reducing the quantity of water for bathing, sanitation etc. In addition to general hygiene and sufficient water, respondents were found to be particularly content with the impact of percolation wells on cattle health, improved productivity and consequently increase in household incomes.

Figure 6 – Benefits from percolation wells



As shown in the figure above, 89% of those interviewed as part of the study were happy about the adequate quantity of water being made available for cattle, 78% reported enhanced milk production and 71% also mentioned increase in family income as one of the major benefits. Increased availability of water resulted in increased milk production ranging from 250 - 500 ml per goat. In families with 6-7 goats, 3-4 litres of extra milk was available for sale raising their profits in the range of Rs 900 to 1600 in a month, with an average of Rs 1300 per month. An additional income without extra inputs is extremely valuable to impoverished households.

However, the health impact of percolation well is most crucial in the rural communities as they do not have resources at disposal to meet any health related exigencies in the vicinity. With improved hygiene and cleanliness, young people, women and older people are not getting sick often and occurrence of preventable diseases has come down. As percolation wells, as in the case of taankas, contribute towards reduction of women's time and labour spent on water collection, an obvious consequence can be seen on women's health and general wellbeing too.



Chapter 2 Building local capacities

Most of the drought mitigation endeavours of GRAVIS are based on traditional knowledge and that makes the community acceptance and ownership much easier. However, with the dismantling of traditional structures the need to restore traditional knowledge assumes importance. Further, with the introduction of innovation to the traditional practices for drought mitigation, it becomes critical to ensure parallel investment in community capacities and awareness.

Table 2 -Overview of trainings

Sn.	Interventions	Numbers	Beneficiaries		
			Males	Females	Total
1	Taanka	432	1200	1800	3000
2	Bio Sand Water Filters	432	1200	1800	3000
3	Beri	20	60	80	140
4	Trainings - VDC	40	370	167	537
5	Trainings - WSH	40	300	475	775

As shown in the table above, by the end of June 2023, a total number of 80 trainings were organised by the GRAVIS for VDCs (40) and on water, sanitation and health (WASH- 40). VDC trainings primarily focused on the following themes :

- Role and functioning of VDCs in villages and in project implementation (selection, monitoring and handholding) and function of VDCs.
- Elements of strong and equitable society and role of VDCs in it
- Creation of self-reliant community and sustainability of project beyond project timeline

Trainings on WASH were organised for local community, including women and the key theme of these trainings were:

- Sharing on importance of clean water for good health
- Importance of maintaining personal hygiene and good sanitation
- Importance of safe drinking water, treatment of water, importance of biosand water filter and it's maintenance.

By the end of June 2023, all the respondents interviewed had undergone atleast two trainings, and 50% of the respondents had undergone two trainings each, for VDCs and on WASH. Additionally technical trainings were organised on the theme of maintenance of rainwater harvesting structures, such as taankas, beris, and biosand water filters (BWSFs).



2.1 Creation and training of local Village Development Committees (VDCs)

VDCs are symbols of local and traditional democratic processes at the village level. For local communities VDCs have a maximum amount of influence on social and political lives of people in the community. Mostly having older and respected people drawn from the community, these VDCs are vested with powers to take decisions on behalf of the community and are expected to look after the interests of everyone. While many villages have already existing VDCs, the majority of them have become defunct over a period of time. GRAVIS has been working closely with these community based institutions and rebuilding and mobilising them to play a greater and accentuated role in the progress of the community. At the onset of the WSHT project, GRAVIS conducted an assessment of the status of VDCs and mobilised them again. The rejuvenation exercise entailed meeting local communities in groups, identifying members and chairs for these groups and conducting orientation meetings for them. Ensuring gender balance in these committees was a crucial aspect of their formation. Prevalence of regressive gender norms and intensive engagement in water fetching, keeps women away from any local and community activities involving decision making. Over many years, with lost opportunities for education, women tend to become mute and passive community members.

Through a total of 40 trainings involving 537 people, of which 167 were women, GRAVIS ensured that women also had a platform for voicing their opinions in decision making for community issues. Through these trainings and initial hand holding, these committees learnt about the role of VDCs and technical aspects of conducting their meetings, recording them as well as ensuring space for women in decision making. These VDCs, typically with a membership of 6 people, including atleast 2 women, discuss key matters pertaining to community wellbeing and development. Inclusion of women in the committee ensures that specific problems and challenges faced by women are also effectively considered in the meetings of VDCs.

Through leadership trainings GRAVIS prepares VDCs to deliberate on the most suitable solutions for a community's problems while ensuring equity and inclusiveness. However, the most important part of VDC's role is with regard to the implementation of drought mitigation, rainwater harvesting and water and food security related projects. VDCs are actively involved from planning to implementation of various interventions. In the context of WSHT project, VDCs newly formed and revived VDCs have been involved at the state of planning - identification and articulation of community needs and sites where construction/renovation work needs to be taken up so that it benefits the largest section of the community. VDCs have the most crucial role identifying and selecting the beneficiaries. As resources are limited, VDCs prioritise construction of taanka for community members who are in dire need of support. These decisions are taken based on the urgency, gravity of the crisis the concerned family is in, means of livelihoods, and existing assets with the family. After discussions and consulting others in the village, VDCs take the decision on the beneficiaries.



A VDC training

Role of VDCs are critical in the rural context for several reasons. VDCs are normally constituted of experienced and wise individuals who have the understanding of village level issues and who are best placed to take the decisions on behalf of the entire community. When asked about the learnings from these trainings: 76% of VDC members were of the view that they got an overall understanding of working together as a group responsible for the development of the village. 85% members said that before the training took place, they had never thought that participation of women in decision making is so important and its only after we underwent the trainings conducted by GRAVIS that we were able to acknowledge and appreciate women's presence in the committee and importance of their opinion in final decisions made by the committee. 65% of VDCs members said they have taken on the role of educating people on water conservation and maintaining cleanliness and personal hygiene. 78% of VDC members also mentioned that innovation in the traditional rainwater harvesting systems was a very important component of the training. These innovations could be easily understood and adopted by villagers.

2.2 Trainings on maintenance of BSWF and taankas

As mentioned earlier, through the WSHT project, GRAVIS provided BSWFs to more than 400 families. With a view to make sure that all of these families can optimise the benefits from these BSWFs, GRAVIS conducted 40 trainings in which all the beneficiaries of BSWF learnt to maintain them. Each of these trainings were organised for a duration of about 3 hours and started with the introduction to the need and importance of drinking clean and safe water. Perils of consuming contaminated or impure water were discussed at length. Beneficiaries were oriented on the structure, technology and the methods that are adopted in producing a BSWF. Local community took keen interest in these trainings as they could see locally available material being utilised for making a BSWF.



A training on taanka and BSWF

During these trainings, people learnt the construction as well as maintenance of the BSWF. Most of those interviews highlighted the learning that BSWF should be cleaned at least once in three months to maintain its effectiveness and efficiency. It was also found that most of them were also following the practice of servicing the BSWF on a regular basis and had also passed on the skills to other members in the family. Trainings on maintenance of BSWF also provided an opportunity to the local community to learn about the importance of clean drinking water, hygiene and sanitation. For instance, in addition to learning about the process of getting clean and safe drinking water from BSWF and ensuring its proper maintenance, the community was also made aware of the good practices to be followed for ensuring that the water remains clean till it reaches the person who is about to drink it. Keeping the clean water pot covered, using a ladle for fetching water, cleaning and wiping the glasses properly, not touching the water directly with hands, etc. were some of the very basic things that were reinforced through the trainings.

Taanka beneficiaries specifically learnt about the architecture of a *taanka*, ensuring that it does not get dilapidated in rains and making sure that the water being passed on to the tank is clean. External structure that is used as a pathway for the water is crucial to maintaining the utility of the *taanka*. Beneficiaries got detailed instructions on upkeep of *taankas* and the path that directs water into the tank. Those who were using the *taanka* also mentioned that they realise that the storage tank needs to be maintained properly and we must clean it at least once in three months.

Learnings from a range of trainings have become part of the normal routine of local community now. Washing hands with soaps, keeping water pots covered, always keeping storage tanks and pots cleaned, and keeping the surrounding around the water sources - BSWF or *taanka* neat and clean, preventing cattle to come close to them, etc. are some of the basics that people have integrated in their lives, as they now understand the importance of cleanliness and hygiene and the role clean and safe water in maintaining good health and wellbeing.



Chapter 3

Social and behavioural change

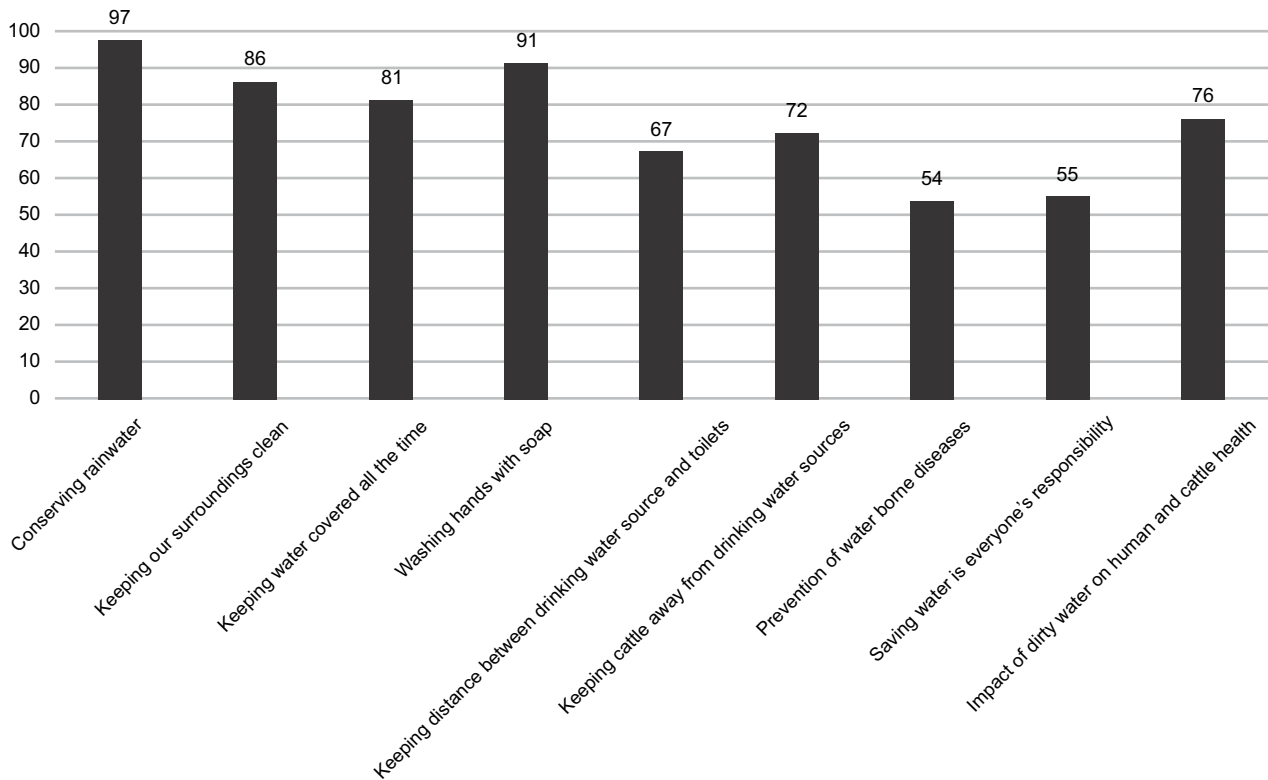
General physical health and wellbeing is determined by people's way of life and practices. While there are many good practices already embedded in cultural practices, a changed environment and new information may always provide for further augmentation of already existing practices, and reintegrating those in our lives that have faded away through history. In both such cases, individuals, communities and institutions can change behaviours to prevent or reduce disease. Through the WSHT project, awareness and capacities of the local communities and community based structures on water, sanitation, good health practices, drought mitigation through sustainable water resource management techniques, were built. Additionally, the project ensured that these newly found skills and the practices picked up during the course of using the rainwater harvesting structures and several trainings that they attended became integral part of their daily routines too. Orientations and sessions of water and sanitation and celebration of events such as 'World Water Day' every year were the two key interventions of WSHT project that all these practices are seamlessly integrated into community behaviour.

3.1 Water and sanitation trainings

GRAVIS conducted 40 trainings in 20 identified villages of Jaisalmer and Jodhpur districts of Thar Desert focusing primarily on water and sanitation to sensitise community - including women, youth and older people. As mentioned earlier, key objectives of these training were to generate awareness among people on importance of clean and safe drinking water, conserving water; maintaining personal hygiene, judicious use of water, keeping self and surrounding clean all the time; and inculcating a culture of ensure maintenance of all the rainwater harvesting structure - community water resources such as beris/village ponds, or household level taankas. The idea behind these trainings was to ingrain a culture of safe and sustainable water use among the community and orient them about the perils of consuming contaminated water, as well as potential benefits from keeping water and environment neat and clean.



Figure 7 – Most important learning from the trainings as mentioned by community



Importance of conserving rainwater, and other learnings such as keeping cattle, garbage away from drinking water storage space, washing hands with soap and keeping water covered all the time, etc. were few of the most common learnings reported by the people who had undergone these trainings. Some of them were particularly thankful to know in detail about the impact of water shortage and use of contaminated water on women's health.

3.2 World water day events

Celebration of cultural events is always a great opportunity to mobilise people around a cause, build awareness and encourage them to commit themselves for larger social good. Celebrated on March 22nd every year, World Water Day (WWD) is a unique opportunity to bring people, including local communities, civil society organisations and experts together to interact with each other and learn from their experiences. GRAVIS has been observing WWD every year and creating opportunities for communities in rural areas of Jaisalmer and Jodhpur to share their problems, experiences and successes with others. 400-500 people participate in these mega events. Innovative media and folk culture is used to communicate the message of water conservation, making communities aware about the looming water crisis and encouraging them to adopt sustainable means of water harvesting.



The messages that are communicated through WWD observation include: saving water and ensuring not even a single drop goes to waste. GRAVIS used this opportunity to raise awareness on gender equity in water use, preserving traditional sources of water and ensuring that they are naturally recharged, and taking responsibility for ensuring that water bodies - household owned or community resources - are not polluted. For rural communities, who are normally home bound and do not get the opportunity to travel to the city or any other far off places, WWD celebrations are unique and joyful learning experiences. Youth in these areas get interested in water conservation issues, leading to creation of a generation of people aware about sustainable water use.



Chapter 4

People at the centre

WSHT project strategy was based on an integrated community development approach that keeps people - the local communities at the centre of all the interventions. In practice, it means that all the key concerns of people are looked at in a holistic manner and encourage them to find their solutions. As desert communities transition from being traditional societies struggling with water crisis to leading the way out of the crisis for coming generations, factoring in community needs as well as existing community resources becomes non-negotiable. In the process of finding solutions to community issues, WSHT project largely relied on locally available, most sustainable and affordable solutions which were clearly reflected in all project outcomes.

Well designed combination of interventions

WSHT project looked at the entire ecosystem to ensure improved sanitation and health for the rural communities. Access to water was enabled through taankas and beris, and safety and cleanliness of water was ensured through provision of BSF. Looking at both the availability and the quality of water resulted in tangible outcomes in terms of improved nutrition and health status of human and cattle population in the region. Being primarily farming communities, their reliance on livestock was factored into the project design and water availability for their cattle led to enhanced milk production and consequently, improved nutrition and financial gains. This approach reflects the recognition of centrality of water in aspects of community life. All interventions related to water, not complemented each other very well, but also enhanced the collective impact.

Embedded in local value systems

Gradual erosion of traditional knowledge from the community system was acknowledged at the onset itself. As rural communities are nature-positive by disposition, GRAVIS built on this strength and engaged with the local community with firm belief in community traditions that preserve and support local food systems and other sustainable practices that have made these communities resilient to recurrent droughts. Place of elders in decision making was recognised and encouraged through mobilisation of VDCs and participation of the entire community in decision making was ensured. Primary reliance on local structures and value systems lent impetus to the project interventions.

Women as active participants

Provision of water at doorstep is most empowering for women. The need for them to go to a far away water source and carry water for miles is not needed any more. Women feel emancipated and are encouraged to participate in social process, community discussions and training and orientation sessions organised by GRAVIS on various issues such as importance of water conservations, sanitation and health etc. With an increased amount of available time with them, participation of women in all these events encourages them



to take active part in community life and share their opinion on various issues. Improved menstrual hygiene and increased educational opportunities create an environment for women and girls that is conducive for their overall wellbeing and their active role in leading the communities out of distress.

Optimising of local resources

Implementation of large scale projects entails extensive financial, technical and human resources. Ensuring availability of all those resources can be ensured only by making the community an active contributor to such endeavours. The project design enabled factoring in available local resources including labour, traditional know-how, as well physical material, such as raw material for making BSWF. Such optimisation of community resources serves multiple purposes. It complements the resources being brought into the community enhancing the outcomes, and plugs any deficiencies that might affect the execution of the project. Further, familiarity of the community with resources smoothens the process of adaptation by people of new interventions, sustaining the impact of the project even after the lifetime of the project. Most important aspect of optimisation of local resources is the sense of ownership, confidence and dignity that are key to building community resilience and inculcation of self sufficiency among the rural and impoverished communities.

Strengthening community based institution

WSHT project accorded the role of fulcrum to VDCs that held the entire project together. Investments in strengthening these institutions that are project mirror images of community aspirations lent the most representative leadership to the project activities. In villages far removed from the public institutional support, role and importance of community based institutions assumes greater significance. GRAVIS reached out to and capacitated all the VDCs to play this leadership role and oriented them on criticality of gender balance and equitable distribution of resources, in addition to the technical trainings on leadership, water conservation and hygiene.

Near universal recognition of the water crisis and climate change induced water shortage have got the global community to look at rainwater harvesting as the most promising and sustainable solution for all the water woes. GRAVIS' experience of working with the rural communities in the Thar reinforces this learning. Blending it with the people centric approach has resulted in encouraging outcomes in terms of greater water and food security, better health and improved financial status for communities. WSHT experience may provide a replicable model for all rural and water insecure communities in traditional societies across the world.



Chapter 5

Paving the way

Innovation is a work of a lifetime and leveraging from innovations may require further amalgamation of expertise, collaboration and capacity enhancement at all the levels. Gains from the WSHT project may be multiplied through several means such as expanding the technical resource base, catalysing human resources and making qualitative improvements in the execution of interventions. As the project already has a people centric approach to its implementation, the same may be further harnessed to achieve qualitative and quantitative expansion in the project outreach and outcomes.

Women and youth as leaders

The existing focus on VDCs may be further expanded to include women and youth effectively. This may entail mobilisation of women, girls and youth into intergenerational groups, orienting them on the women and youth power and entrusting them leadership responsibilities in the area of health, hygiene and sanitation. Knowledge and capacities on water conservation, good hygiene practices, and health care may potentially penetrate each and every household creating a community of learners and practitioners of hygiene and health care. Encouraging women's leadership in this endeavour will empower them to positively influence the gender imbalance in society and trigger equitable distribution of resources, eventually facilitating transition towards a gender just society, along with a healthy society.

Extension of technical expertise

Technical capacities of people for maintaining RWH structures, and maintaining cleanliness of water may be further expanded to include active involvement in creation of physical assets. Although the community has been contributing labour towards the construction of taankas and cleaning of percolation wells, this contribution may take the form of skilled labour for supporting such constructions. Similarly production of BWSF may be entrusted to the community following rounds of trainings on each process till the end product. Such expertise may potentially become a livelihood option for local unskilled youth and may cater to the needs of larger communities. Availability of local resources to resolve local issues will eventually create robust and drought resilient societies having all the requisite expertise to deal with water scarcity and prevent outbreak of communicable diseases.

Comprehensive coverage

Both the access to and quality of water are two determining factors for human health. RWH structure enables provision of water, and BWSF ensures that the same water is safe. While it is important to keep expanding the outreach and ensuring all the households have access to sufficient water, it is suggested that BWSF is dovetailed with these structures, to prevent consumption of unsafe water. Need for such support is much greater than the available resources and GRAVIS must use its experience of working with the desert



community, and document and disseminate them with a larger stakeholder base. GRAVIS must also strengthen advocacy with the state and explore avenues for institutionalisation of elements of its strategies. Refurbishment of government infrastructure and ensuring its expansion to envelop rural and far off communities may lend a greater scale to all interventions.

Increasing the periodicity of mass mobilisation

Mass mobilisation through WWD observation needs to be further expanded through other such events at various levels. Micro levels may engage local communities very effectively, and may be intertwined with local harvest festivals to have a snowball effect. At a higher level, respective local government may be roped in to impart further legitimacy and continuity to the efforts. Culmination of these multiple micro events may take the form of a state level conglomeration with inclusive participation of all stakeholders. Use of mass and innovative media, and building political advocacy around the issue of water, sanitation and health will lead to enhanced traction and mobilisation.

Catching them young

Maintaining hygiene is a behavioural issue as much as it is contingent on availability of water. Reaching out to children, school students and young learners through child friendly literature, awareness materials and engaging conversations may lead to an early onset of curiosity and ensuing responsibility around the issue of water, sanitation and hygiene. Children may be engaged through local micro events, competitions, awards for innovative ideas and may even be encouraged to run campaigns within their respective localities. Awareness, sensitivity and recognition of the need to adopt sustainable and hygienic means to water conservation will result in an entire generation transformed as water warriors.

Among the beneficiaries of taankas and BWSF, most of them have used such structures for the first time in their lives. Transformative impact of WSHT project on the lives of local communities is a work of marriage between traditional wisdom and technical innovations. With local communities leading their own way out of the water crisis, support should continue to be extended in terms of technical backstopping to consolidate the gains and accentuate their ripple effect on all aspects of rural desert life. GRAVIS, a major NGO working in this region has a major role to play in translating the vision of water secure and healthy communities. WSHT project is a leap forward in this direction.



Acronyms

VDC	Village Development Committees
BWSF	Bio Sand Water Filters
GRAVIS	Gramin Vikas Vigyan Samiti
WWD	World Water Day
WSHT	Water Sanitation and Health in Thar
PHC	Public Health Centre

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GRAVIS is a leading Non-Governmental Organization working in rural India in the States of Rajasthan, Uttarakhand, and the Bundelkhand region of Uttar Pradesh. Since its inception in 1983. GRAVIS has worked in over 1700 villages reaching a population of over 1.7 million and has established over 4,000 Community Based Organizations (CBOs). GRAVIS believes in participatory community development that blends traditional knowledge and modern sciences and promotes equality.

GRAVIS is registered under Rajasthan Societies Registration Act and under section 80 (G) and 12A of IT Act, 1961 of Government of India with tax exemption status.