

# FILLING THE EMPTY PITCHERS



**Gravis**



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A study on the impact of rainwater harvesting on the  
lives of women and young girls

**Gravis**



# **Filling the Empty Pitchers**

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## FOREWORD

Harvesting rainwater is critical in the Thar Desert and in many other arid settings around the world. Water deprived communities face multiple challenges and traditional rainwater harvesting techniques have often come to rescue in these areas. Availability of water certainly makes a big difference and paves path to sustainable community development.

GRAVIS has been addressing water scarcity related challenges over 30 years now. Our work has focused on reviving traditional water harvesting knowledge by blending it with modern ideas and science. As a result, about 1 million residents of Thar have been benefited. For a long time, a need of measuring the impact with the help of a study was being felt.

The study is an attempt to understand the impact of GRAVIS' rainwater harvesting interventions and to draw some lessons for the future approach on water conservation. While the study will be useful for us and for the Thar Desert, our hope is that it becomes a useful document for other organizations as well in different parts of the world dealing with water related challenges.

Our sincere thanks go to IFHE, US for their funding support to the study, to Dr. Neetu Sharma for leading the study and to the Thar Desert communities and GRAVIS team for their valuable support.

**Prakash Tyagi**

Executive Director, GRAVIS



## **AUTHOR'S NOTE**

The intricate relationship between water availability and the women's life, especially in the water scarce developing regions, have been an area of interest for researchers for some time now. There has also been ample literature pointing towards the fact that the perennially belligerent climatic conditions in deserts add further hardships to women's life. The study conducted with an objective to document the impact of rainwater harvesting on women's and young girls life further establishes that such endeavours, if carried out while acknowledging the existing gender dynamics in the society and ensuring effective participation of the community, may have transgenerational implications too.

Present study records the critical impact of the rainwater harvesting structures constructed with support of GRAVIS in the Thar region, on the social, political and economic life and health of women, and the educational opportunities for young girls. The consolidation of empirical evidence with the qualitative information collected from the direct beneficiaries place the rainwater harvesting as strategic interventions that by enabling water availability, provide women the opportunity to explore their potential in various capacities – as an effective participant in social and political life, contributor to family finances and also as an informed and empowered citizen.

The study also provided an opportunity to acknowledge and appreciate the challenges while also establishing the need for further work in the same direction. However, the most critical contribution of the study is to explore the potential of rainwater harvesting in defying inequitable gender norms and empowering women to be an equal partner in decision making at community level as well.

**Neetu Sharma**





## INTRODUCTION

*She sends me to fetch water Very early in the morning Oh!*

*Grandpa, it is very difficult for me*

*My pot never fills up fully*

*The water is so deep That my rope hardly reaches it*

*The sun rises and also sets By the time,*

*I return Unable to collect even one pot-full of water*

**-- A folk song of Rajasthan**



*Arid landscape of Thar*

Water is the fundamental part of our ecosystems. Its presence or absence has a direct bearing on the ecosystems services and thereby on people. Its direct link with the survival itself makes people in the water scarce regions very much vulnerable. Relatively larger amounts of water are used to generate the ecosystem services needed to ensure provisioning of basic supplies of food, fodder and fibers. Since water is available in various regions in varying quantities, managing of water is a great challenge facing humanity. This makes it essential to find sustainable methods for managing water which incorporate all water users (environment, agriculture, domestic and industry) and ensuring that these methods are low cost, simple and replicable in areas that are in dire need of such interventions. There are numerous positive benefits for harvesting rainwater. The technology is low cost, highly decentralized empowering individuals and communities to manage their water. It has been used to improve access to water and sanitation at the local level, especially in rural areas in arid zones. In agriculture rainwater harvesting has demonstrated the potential of doubling food production by 100% compared to the 10% increase from irrigation. Rainfed agriculture is practiced on 80% of the world's agricultural land area, and generates 65-70% of the world's staple foods.<sup>1</sup> Hence the benefits of rainwater harvesting for impoverished communities are many, ranging from availability of safe drinking water to food security and financial gains derived from horticulture and agriculture.

In developing countries water scarcity turns out to be even more complex for the rural communities. Lack of safe, accessible, sufficient, clean and affordable water has much more adverse impacts specifically related to women in developing nations. In most countries, women are the primary household members responsible for providing water for domestic consumption. The collection of water, which may take up to six hours a day to meet the household needs, is a duty often relegated to women and children.

This foregone time often prevents children, especially girls, from attending school and women from pursuing small business opportunities.<sup>2</sup> In 2000, the Second World Water Forum in The Hague concluded that women are the primary users of domestic water, that women used water in their key food production roles, and that women and children were the most vulnerable to water-related disasters.

In every household, particularly in the rural areas in Rajasthan women and girl children bear the responsibility of collecting transporting, storing, providing and managing water. In places, where there is no water for farming, men migrate to urban areas in search of work leaving women behind to fend for the old and the children. Women spend most of their time, collecting water with little time for other productive work. This impacts on the education of the girl child, for even if the girl is herself not collecting water, she is looking after the home and her siblings when her mother is away. The chore of water collection is anyway back breaking having adverse effects. Regular and prolonged contact with water also makes women prone to water borne diseases. Preoccupation with the water fetching activities resulting

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<sup>1</sup> Rainwater Harvesting: A Lifeline for Human Well-Being, A report prepared for UNEP by Stockholm Environment Institute, UNEP by Stockholm Environment Institute, 2009, <http://www.gwp.org/globalassets/global/toolbox/references/rainwater-harvesting.-a-lifeline-for-human-well-being-unesp-2009.pdf>

<sup>2</sup> Maggie A Montgomery and Menachem Elimelech, Water and Sanitation in Developing Countries: Including Health in the Equation", Yale University, 2007, <http://pubs.acs.org/doi/pdf/10.1021/es072435t>

in low education levels keeps them at bay from getting involved in social and political life in the community. This also affects their decision making power both within and outside the house.

Several methods and techniques are used to ensure availability of water. At some places, ground water becomes the most commonly used source, not only for personal and household use but for agriculture as well. However, the need to apply most sustainable methodologies for accessing and using water is being increasingly acknowledged. And the most sustainable way of managing water has been capturing the rains and accumulating the water that may fulfill water related needs even during dry seasons too. In addition to being sustainable, Rain Water Harvesting (RWH) can be done at the local level and has the potential to benefit people in multiple ways. Some of the RWH techniques and structures are based on traditional wisdom, are low cost and are based on sustainable technologies. Rainwater harvesting has in many cases not only increased human well-being and ecosystem services, but also acted as a way of improving equality and gender balance and of strengthening social capital in a community. Improving domestic water supply by rainwater harvesting saves women and children from the tedious work of fetching water. It also improves household sanitation and health. In many instances women have benefitted from having water for a small kitchen garden, thus improving diets and incomes. The value of community organisation empowered by the implementation of rainwater harvesting has strengthened communities and allowed them to address other issues related to development, health, and knowledge of their livelihoods and environment. These are important benefits which can further help individuals and communities to improve both ecosystem management as well as human well-being.<sup>3</sup>

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<sup>3</sup> Rainwater harvesting: a lifeline to human well-being, Policy Brief, Stockholm Environment Group,

## **GRAVIS bringing the change**

The Thar Desert covers an area of 44.6 million hectare (mha). In India, most of the area of the Thar Desert is situated in western Rajasthan. Of the total area of the Thar, nearly 60 per cent is being cultivated, with varying intensities of cropping, and 30 per cent is open pastureland. Agriculture in the region is extremely precarious and four out of every 10 years on an average, are drought years. Strong winds blow for four to five months in a year over a large part of the desert region. Dust storms during summer are a common feature. Located in north-west India, Thar Desert is one of the most arid regions of world. With population of 23 million people, it is the most densely populated arid regions of world. The average annual rainfall is 100-200 mm. Recurrent failures of rainfall cause droughts and create extreme water scarcity. Land-use in the Thar is dependent on rainfall. In good rainfall years, large areas are cropped, cattle thrive on extensive pastures and substantial amounts of hay are stored for future use. Rainwater is stored in ponds and underground tanks. As rainfall is very erratic, a pattern of mixed farming has been developed in which human and animal populations benefit from each other.

GRAVIS has been working in these difficult terrains for the integrated community development for the drought struck agrarian and pastoralist community. Adopting a gender mainstreaming approach, GRAVIS has been making efforts to ensure food and water security for people in the arid regions of the Thar. These efforts have ranged from construction of rainwater harvesting structures that are based on the traditional wisdom and further remodeled with the help of modern technology, to building the capacity of people in maintaining such structures, and also making judicious use of the water available through these structures for horticulture and silvi-pasture. Enhanced food available through the horticulture units have ensured food and nutrition security for people and sufficient fodder has been made available for cattle through silvi pastures have contributed towards more productivity and consequently improvement in the financial status of families.

**Table 1 - Types of rainwater harvesting structures constructed by GRAVIS**

<p><i>Taanka</i> (drinking water storage tanks)</p>	<p>This method for collecting water consists of a covered cylindrical tank with the capacity to store between 18,000 and 20,200 litres of water. Water is gathered in one of two ways: either a rooftop catchment which pipes water into the unit, or a groundwater catchment area where water pours in through a grate on the side. The first taanka built by GRAVIS was in 1985. Since then, GRAVIS has built 6,635 taankas which are maintained by locals. One taanka can support a family of 10 for 4-8 months of the year.</p>
<p><i>Beri</i> (Percolation wells)</p>	<p>These large underground water storage percolators are covered with a concrete top and gather ground water during monsoon season. One Beri can store up to 500,000 liters of water and does not require a pump, making it easy for villagers to fix and maintain. This traditional method of water gathering uses no artificial catchment and holds enough water to sustain a family of 10 for up to two years. To date, GRAVIS has built 588 beris, providing 2,926 families with a stable source of water.</p>
<p><i>Naadi</i> (village ponds)</p>	<p><b>Naadi (village ponds)-</b> These village ponds are natural collections of rainwater which provide an open source of water to entire villages. Natural vegetation grows easily in these areas and helps to further reduce soil erosion and silting of the naadi. A medium sized naadi provides a community with water for 2-6 months in a year of average rainfall, whereas big ones carry water all year round. To date, GRAVIS has worked to desilt 263 naadis, supporting 801,140 families.</p>
<p>Village Bunds</p>	<p>As the village pond, or naadi, is used by the community for both bathing and drinking water, it is important to keep contaminants out of the water. Since many villagers live near the naadi, there is a serious potential for household waste to seep into the naadi. In order to avoid contamination, GRAVIS works with villagers to plan and construct bunds around households to redirect unclean water away from the naadi</p>
<p>Bio-Sand filters</p>	<p>This technology uses local materials to filter and clean drinking water. A concrete box about 1 m height is filled with a layer of coarse gravel, finer gravel, and a larger layer of sand which filters the water. Above is a liquid layer containing micro-organisms which consume pathogens in the water. After the water passes through all these materials it flows out of a tube and into a sealed water storage unit.</p>



Strategic focus on water security for integrated community development has helped GRAVIS reach out to the most impoverished communities in the Thar. In addition to food and water security as direct outcome of harvesting rainwater, the interventions made by GRAVIS have touched each and every aspect of community life in the Thar. With enhanced availability of water, hygiene and consequently health has also improved. Considering that making water available at household is considered as responsibly of only female, lives of women in the Thar have been changing rapidly after water sources have been brought closer to them. Not only their physical strain has reduced tremendously, the impact can also be seen in the form of their social mobility, improved education levels and enhanced role in decision making at various levels

## **Assessing the impact of RWH interventions**

Availability and access to water is a not only a key human development indicator but is also a defining factor for the quality of life that people can lead in a given geographic and socio economic context. Access to water is directly linked to health, sanitation, hygiene, food security and nutrition. For the rural impoverished communities in rainfed areas water scarcity is a perennial challenge to life and wellbeing. Water scarcity in the Thar region is a critical determining factor in defining the living conditions of the community. Dependence on rainfed agriculture and animal husbandry for livelihood coupled with the recurring droughts and prolonged dry spells, have direct consequence on agricultural productivity and thereby availability of food.

No aspect of human life remains unscathed by the phenomenon of perpetual water scarcity. Illusive rains and elongate dry spells also forces people, especially males to migrate to cities for alternative vocations or to greener pastures in search of fodder for their cattle. Such instability also takes a toll on the prospects of education and overall development.

While water scarcity does not discriminate between human beings and affects everyone equally, its impact is much more aggravated for the females. Social, cultural and physiological factors are attributable for an intensely difficult experience that women and girls go through in the drought prone areas. In traditional rural society taking care of household and making food and water available for the family members and the cattle has remained a responsibility of female members. Females in such communities are circumscribed with the specific roles that require them to set aside considerable amount of their time only on fetching water to satisfy household demands. This further restricts opportunity for education for young girls, mobilization of women, exposure to the outside world and compromises the potential that exists for them to play any constructive role in political, economic, social or even cultural life. There is also clear link between water and health of women in the Thar Desert.

Socially, the biggest impact of water scarcity could be seen on the female population. Procuring water is considered to be a household task, and the women and the girl child are involved in

procuring water. They need to walk miles everyday in the hot and harsh climate. This contributes to wide range of health problems among women particularly affecting reproductive health and disables girls to attend schools.

This is the situation most women and girl children in semi-arid Rajasthan find themselves in for much of the year. They trudge bare foot in the hot sun for hours over wastelands, across thorny fields, or rough terrain in search of water, often the colour of mud and brackish, but still welcome for the parched throats back home. On an average, a rural woman walks more than 14000 km a year just to fetch water.<sup>4</sup> The virtually dry and dead water resources have lead to acute water scarcity, affecting the socioeconomic condition of the society. The drought conditions have pushed villagers to move to cities in search of jobs. Whereas women and girls are trudging still further. This time lost in fetching water can very well translate into financial gains, leading to a better life for the family. If opportunity costs were taken into account, it would be clear that in most rural areas, households are paying far more for water supply than the often-normal rates charged in urban areas. Also if this cost of fetching water which is almost equivalent to 150 million women day each year, is covered into a loss for the national exchequer it translates into a whopping 10 billion rupees per year<sup>5</sup>



*A taanka by GRAVIS*

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<sup>4</sup> Asha Krishna Kumar, "Women and Water", Frontline, Volume 20 - Issue 20, September 27 - October 10, 2003, <http://www.frontline.in/static/html/fl2020/stories/20031010001107700.htm>

<sup>5</sup> <http://ncw.nic.in/pdfreports/Women%20&%20Water.pdf>



GRAVIS, has been focusing in the areas of drought mitigation and improving the living conditions of women in the region. Over past 35 years, GRAVIS has done commendable work in over 850 villages creating rainwater-harvesting structures at household level and at community level. Establishment of horticulture units and silvi-pasture lands has complemented these structures. Over 600,000 women have been benefited and have been freed from water-fetching-drudgery.



*A beri in Thar*

**Table 2 - Rainwater harvesting structures built by GRAVIS (as on April 2016)**

Sl No.	Rainwater harvesting structures	No. of structures built	Families benefited
1.	Taanka	6635	19905
2.	Beries	588	2926
3.	Naadis	263	801140
4.	Khadins	5095	20380
5.	Bio Sand filters		
6.	Arid horticultural units (AHU)	3815	12447
7.	Silvipasture units(SPU)/Orans	69	65910

It is to be noted here that GRAVIS has also been making conscious efforts to mainstream women and girls, RWH is always done on the name of head women of family. This increases her ownership and reorganization in family. SHG women are given preference to have *taanka*. Families having RWH at household are encouraged to send their daughters to school. To reduce the obstacle, bicycles have been given to girls of *taanka* beneficiaries.



*Naadi is an important asset in Thar*

Rainwater harvesting carried out by GRAVIS has resulted in a set of multiple positive outcomes for the community and since women have been investing an enormous amount of time and energies in fetching water, the impact is very much evident on the lives of women. This emancipation has manifested in improved educational opportunity for young girls, greater leadership role at community level and better health for women, among others. It is in this context that the proposed study seeks to analyse the extent of outcomes and impact on various aspects of women's lives.

### **Objectives**

Overall goal of the study is to create a body of knowledge based on evidence of impact of rainwater harvesting on the lives of women and girls. Specific objectives of the study were:

- To understand the ascertain the impact of the rainwater harvesting of various aspects of women's life, especially health, particularly focusing on nutritional status, hygiene, reproductive health and mental health

- To assess the extent of replication of the rainwater harvesting structures by the communities with their own resources or through Government support
- To analyse the influence of rain water harvesting on girl child education
- To understand the improvement in financial condition of households due to harvested water and women's ownership
- To make attempts to quantify the value of time saved by women and girls as a result of water availability and its alternative use
- To assess the impact on evolution of leadership among women that could be attributable to rain water harvesting
- To glean insights suggest strategies geared towards gender mainstreaming and various aspect of community life in the Thar

The study also focused on the future course of action towards gender mainstreaming in rainwater harvesting and ensuring that the interventions do account for the social realities that define gender roles and status of women in society. The study reflects on the potential replicability of the interventions in similar communities while also reflecting on the modifications and corrections.

## Methodology

Since the study aimed at capturing a cumulative impact on the lives of women and girls of rainwater harvesting efforts made by GRAVIS over the past more than 35 years of work in the region, it required a combination of quantitative and qualitative methodology. In order to create empirical evidence quantitative data was collected from primary stakeholders and the same was substantiated by the other qualitative information gathered through observation and discussions with the key informants such as village elders and senior staff of GRAVIS.

Conceptually, the study focused on the gender issues and the impact of rainwater harvesting in the context of challenges faced by women and girls. The outcomes were largely assessed in social, political, educational as well as financial arena that shaped overall understanding of overall impact on the lives of women.

**Sample :** Although GRAVIS has been working in more than 850 villages to promote and facilitate rainwater harvesting through construction of various structures, the sample of about 335 women was drawn from the 18 villages that have been benefitted by rainwater harvesting activities including taankas and nutrition gardens, will be selected as samples.

The criteria for the sampling of household included the following:

- direct beneficiaries households
- proximity and availability
- inclination of the female member to be research participant.



It was also decided to include those beneficiaries only who had been using the RWH structures for more than 5 years or so.

In addition to 335 women, and 70 girls, 70 male members of the community that included members of village development committees (VDCs) and panchayat were also interviewed in order to understand a holistic perception about the impact of rainwater harvesting on women.

### ***Tools for data collection***

The nature of the study design will required varied tool to be used for collection of qualitative and quantitative data.

**Table 3 - Research participants and tools used for data collection**

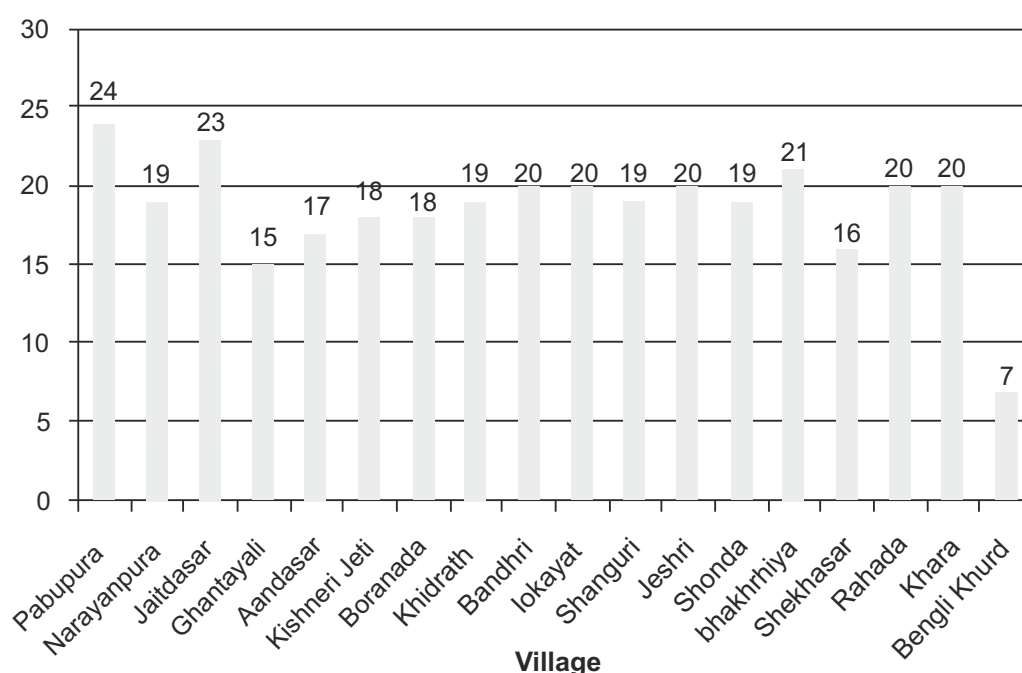
Sl.	Research participants	Tool	Sample size
1.	Women beneficiaries	Interview guide	335
2.	Girls	Interview guide	70
3.	Male beneficiaries including VDC members, panchayat members ad local community	Interview guides	70
4.	Local community	FGD pointers	100

### ***Data analysis***

A data analysis plan was also prepared along with the preparation of the tools. This plan that was comprised of the tool item and the corresponding numeric codes for responses. Quantitative data was fed into and processed in spreadsheets. Analytical tables were prepared and analysis was done to assess the impact. Qualitative information was clustered for further analysis. Data collected during FGDs formed part of descriptive analysis, documentation of narratives and case studies that were used to either substantiate the general impressions about the impact or to project specific issue or achievement.

## **Descriptive Statistics**

A total number of 335 women in the age group of between the age of 18 to 60 years who had been were interviewed beneficiaries of the rain water harvesting structures directly. These women were drawn from 18 villages different villages located in Jodhpur district of Western Rajasthan.



**Figure 1 - Number of women interviewed**

With an average age of around 49 years, and almost 40% of them being above the age of 50, all the women interviewed had benefitted from the rainwater harvesting intervention of GRAVIS for not less than six years or so. Average household size for the women were interviewed was about 6 with largest family being of 19 members.

The exasperating impact of poverty, illiteracy and backwardness manifests in obstacles for any growth opportunities in economic, social or political arena. Lack of educational facilities, distance to schools, socio cultural norms and the primary responsibility of water fetching being with women, water scarcity is one of the key contributing factors to widespread female illiteracy among women in these villages. The women in this region also had a very low level of school education. Most of them (248 out of total 335) of them were totally illiterate. 83 (24%) women reported that they were literate but it meant that they could just write their names and nothing beyond that. Only 5 (less than 1.5%) women had done their schooling up to standard V. The fact that women used to get married before they turned 18, the legal age of marriage, was quite evident during the study. 194 (58%) women had got married before 18.

The households who had received benefits of the rainwater harvesting belonged to economically poor sections, who had no other means to access water and did not afford to pay for it either.

## Impact of rainwater harvesting on women

Various types of rainwater harvesting structures have facilitated access to and availability of water for drinking, cooking, for agriculture, horticulture and also for cattle. Especially in the case of household use and drinking purposes, it is the sole responsibility of the women to arrange water for household and children, normally young girls are supposed to contribute in this process. With access to water for drinking and other household purposes in the vicinity, some of them do not even have to walk out of their premises to fetch water.

## Utility of rainwater harvesting structures

Invariably all the 335 women interviewed during the study were of the opinion that provision of rainwater harvesting has been very useful for the entire household and especially for themselves given the amount of time and physical exertion that they had to invest in fetching water. All the women also felt that the provision of rainwater harvesting structures have brought about qualitative changes in their lives.

For entire household	For women
<ul style="list-style-type: none"> <li>• Water is available all the time, even in summers</li> <li>• Water is available close by</li> <li>• Clean water is available</li> <li>• Time is saved for household work and children and family</li> <li>• Money is Saved</li> </ul>	<ul style="list-style-type: none"> <li>• Relieved from burden</li> <li>• Can spend time with children</li> <li>• More time for creative and productive tasks</li> <li>• Can relax and rest too</li> <li>• Saved from hot scorching sun</li> </ul>

**Figure 2 - Benefits from rainwater harvesting in the Thar as reported by community**



*A khadin by GRAVIS*

GRAVIS staff interviewed during the study were of the view major benefit is the enhanced capacity through saved time, money and increased education among girls. Many more girls are going to schools, which was not possible earlier. Gradually, but they are getting exposure to outside environment and learn. As per the general estimates done by staff of GRAVIS and the experience in working with the community, women used to spend about 4 to 6 six hours only in gathering water for the household and cattle. All the women beneficiaries of the rainwater harvesting interventions that the time spent by them on rainwater harvesting has come down considerably. During the interviews, women also reported saving of time in the range of one hour to six hours, depending upon the reduction in the distance.

**Table 4 - Number of hours saved per day**

Sl. No.	Number of women	Number of hours Saved per day
1	3	1
2	162	2
3	157	3
4	6	4
5	5	5
6	2	6

During the study, a substantial amount of saving by recorded by most of the women. 90% of the women reported to had spent about 5 hours everyday in the past in the absence of any water facility in vicinity on water fetching and more than 90% also reported that they now save atleast about 2-3 hours every day. Few women also reported that the amount of time saved is well beyond 5 to 6 hours. Provision of drinking water has revolutionalised the way women spend their time. With much more additional time at their disposal, they are able to spend more time with their families, socialize more, invest in skill development and are even getting mobilised for economic ventures and for political leadership at the local level.

*Meeting of a self-help group was underway and the discussion was happening on the need for a school for the girls in the vicinity, and ensuring that ANM comes to the village on regular basis. Various way and means, including the possibility to discuss these matters with the village panchayat were being discussed.*



## Story of Sajjan Kanwar



**Sajjan Kanwar with her grand children, sitting on *taanka***

*Sajjan is 51 years old and has been a member of the SHG for the past one and a half years. She says, 'even after working in fields and completing household work, we have time to meet with each other and discuss many issues that affect us.' She has a taanka constructed in her house four years ago, that saves a lot of time for her that she used to spend on fetching water. She said, 'I used to go to fetch water multiple times during the day because we have a large family with 13 people, and there is a limit to how much I can carry in one trip. My life has changed after we had access to safe drinking water within our premises. Not only do I spend more time with family, I am also able to meet other women. I became a member of an SHG through which I save money and am also planning to start a small enterprise.*

*Production of crop had also increased after a khadin was made on our field five years ago. With more finances and time, I was able to participate in SHG meetings and was chosen the president of the group as well. My health is also better now. I am happy that my grand daughter who is 7, does not need to carry water and can go to school regularly and concentrate on her studies.*

*Khadin and taanka have changed our lives for good. It's not only I who has been saved from drudgery, these structures have helped all of us in the family lead a much better and comfortable life.*



## Women's role in leadership and decision making

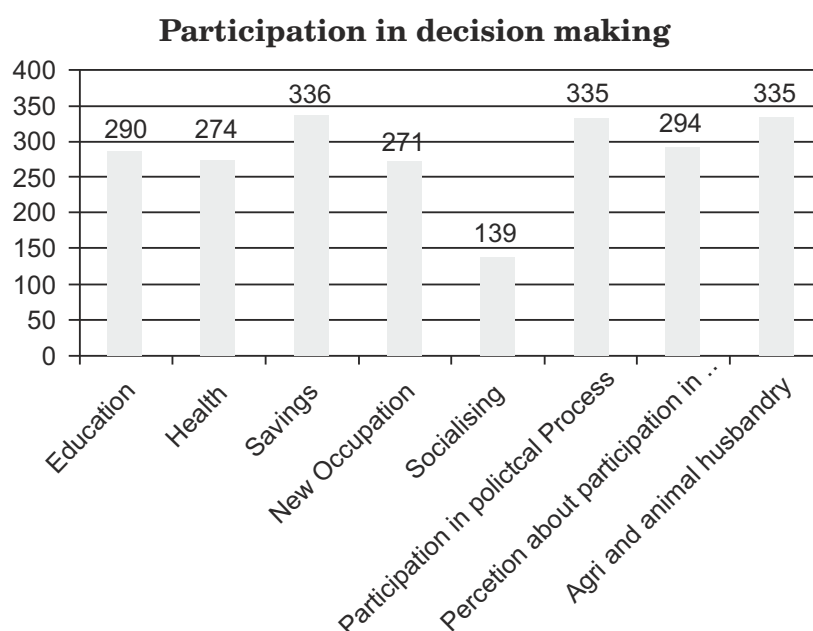
Pressure of collecting water for household always kept women occupied, depriving them from the opportunity to explore their leadership skills and play an active role in decision making. Overall changes in their wellbeing propelled by the rainwater harvesting have opened an entire arena of social empowerment and decision making opportunities for playing leadership role in the community. Financial empowerment, increased opportunities for education and more time, women are also becoming active stakeholders in the decision making at household level as well as in the community. All the women interviewed did indicate that their role in decision making has become important than it was many years ago.



*Women and girls in Thar*

Figure 3 attempts at explaining the role of women in making decision about various household related and participation in community related matters. All the women said that their empowerment and mobilization has manifested in increased decision making power. 88% of women respondents were of the view that they are now able to take decision regarding household savings and participation in electoral/political process at community/village level. All the women also noted that they are able to influence the decision regarding agriculture and animal husbandry being done by the family. 86.5%

women mentioned that they are now able to make decision regarding the education of their children, and almost 82% expressed their contentment with the fact that their decisions related to health issues within the family are accepted by the family now. 81% women also felt that if they suggest and make any decisions regarding venturing into a new occupation, the same is respected by the family members. It is to be noted that decision related to stepping out from the household and meeting people in the community normally continues to be a male domain. While 41.5% did respond that they are able to take decision regarding going out of the house and meet people, majority of them felt that if at all they are able to do so, it is only after the approval of their husbands and other elders in the family.



**Figure 3 - Impact of participation of women in decision making**

Membership of community based organization and the local self government institutions is a marker of social and political mobilization. While it is difficult to scientifically directly attribute this phenomenon to the access to water enabled through the rainwater harvesting structures, major contribution that they have made towards such mobilization cannot be ignored.

Out of the total women interviewed, almost 50% were members of VDCs and about 40% were part of the SHGs created and facilitated by GRAVIS. All the women also reported that there has been a steady increase in the number of women participating in various processes at community level and also in the local political processes. While it may be difficult to establish a causal relationship between the two, the association between availability of more time and participation in political processes cannot be undermined.

Senior staff of GRAVIS who have been working with the community were also of the view that RWH is giving opportunity to women and girls to make decision about themselves and it is only possible through saved money, time and opportunity to read, learn or to do some extra productive enterprise and activities. It was reported that the time and money saved because of the RWH is improving the social status of

women in families. Some women are now part of SHGs and even members in VDCs. Their leadership role has enhanced over a period of time and relive from drudgery is definitely one of the major reasons for the same.

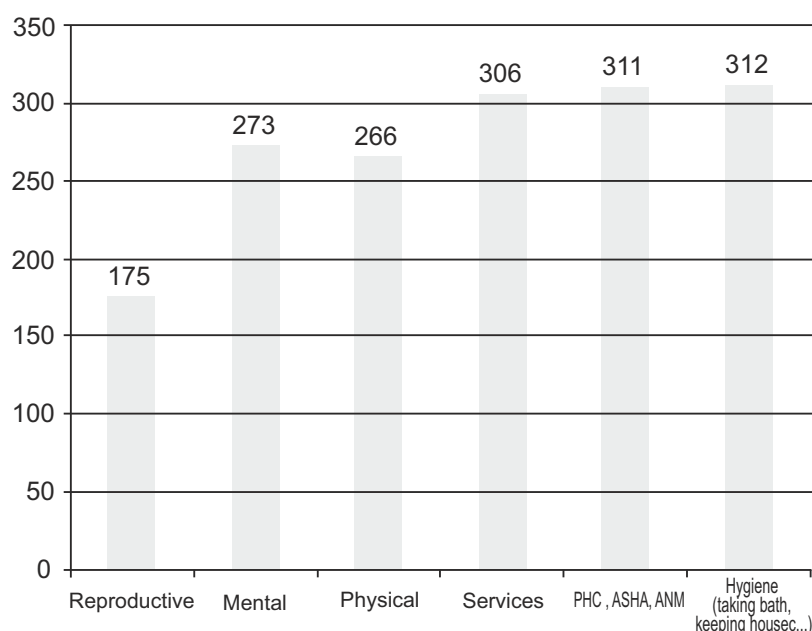
While taking complete cognizance of constraints in mobilizing women to be able to actively take part in decision and be assertive about the same, the staff rate the interventions as good on the graded scale of excellent, good, average and poor. The staff felt that the independent voice of women is yet to come out of the shadows of the approval by the males, and role of rainwater harvesting is critical in this.

Another critical aspect of the impact of rainwater harvesting has been reduction in migration among from rural areas to urban areas among the poor community. During prolonged droughts and acute water scarcity when agriculture becomes an insurmountable challenge male members of the farming communities of the Thar have been moving either with their cattle to greener pastures or to cities in search of alternative vocations. Although such migrations are seasonal and in many cases only temporary, these migration affect households financially as well as emotionally. Women in the households are left with providing for all the needs of children and the elderly people, while also taking care of the piece of land and cattle. Additional physical burden, mental stress and financial and social insecurities have a detrimental effect on women's emotional wellbeing.

All the male respondents interviewed during the including the members of Village Development Committee and Village panchayat, (local self government body) along with few other male members of the community, that it is because of the primary responsibility of getting water for the households lies with women, rainwater harvesting and the consequent availability of water has been most beneficial for women. They were of the view that there are a number of ways that women have been benefitting from the rainwater harvesting. Since collection and provision of water for household needs, drinking and cooking etc. is traditionally a woman's responsibility, having water available close by has resulted in many positive changes in their lives.

## **Health and hygiene**

Carrying water on their heads, as well as exposure to unsafe and many a times contamination water make women most vulnerable to the water borne diseases. This, along with the physical strain and long walks in extremely hot sun and the scarce water to drink and to maintain hygiene, always affect their health. During the discussions with women as well as with other community members it was reported that water scarcity takes the first toll on hygiene. Women said that they could not ensure that children bathe regularly. Unhygienic surroundings and lack of personal hygiene used to lead to low immunity and many infectious diseases especially among children. However, this situation has improved after the water has been made available within the households.



**Figure 4 - Health impact of rainwater harvesting on health**

Figure 4 is based on the responses given by women on various aspects related to their health in the context of rainwater harvesting. Out of the total 335 women interviewed 312 mentioned about the ease in maintaining hygiene after the construction of RWH structures. 311 and 306 women were of the view that the RWH has made access to health delivery mechanisms and services much easier and more women are accessing them now. Women also mentioned improvement in the reproductive health, mental health, and physical health of women and owed it to the provision of water, and reduction in the time spent in fetching water. The most visible impact that was felt by women was on the ability to maintain hygiene. Almost 95% women were of the view that with the construction of rainwater harvesting structures they themselves can bathe regularly and give children also bath everyday that was not possible earlier. They also said that they also able to keep the house clean and maintain basic hygiene with the availability of sanitation facilities. About 91.3% women mentioned that they are in a better situation that enables them to access health related services which has been made possible by the rainwater harvesting and 93% also felt that in fact they are accessing health services at PHC, and services of ASHA and ANM more than before. It is interesting that the number of women who felt that they are in a better condition to access health care services is marginally lower than those actually accessing health services, visiting primary health institutions and meeting the health care professionals.

Most of the women also said that because they are able to maintain personal hygiene for children, they are not falling sick as often as they used to and outbreak of water and vector borne diseases has also reduced.

Women also shared that in the absence of taankas they used to be always worried about water getting over or not being available and now this stress has reduced considerably. While 79.5% women reported improvement in their general physical health and 52% reported improvement in their reproductive

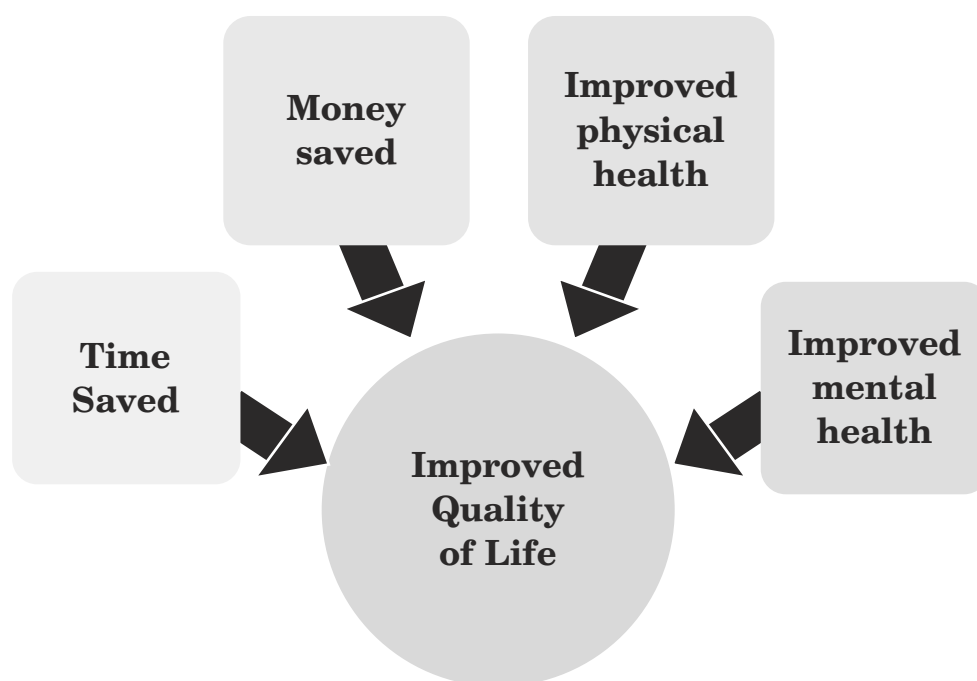


health, interestingly responses related to improvement in mental health outnumbered the responses pertaining to other two health related aspects. About 85% recognized the importance of rainwater harvesting for their mental wellbeing. It is also to be noted here that it is despite the fact that their health situation has improved, women are accessing health services more than before, which is also an indicator of the realization of the importance of caring for their health. This points towards the integrated development approach adopted by GRAVIS that has involved generating awareness among the community regarding various issues including health, along with making relatively tangible interventions such as construction of rainwater harvesting structures.

## **Improvement in financial status**

Availability and access to water also has a direct impact on the economic status of people in the Thar. All the women were of the view that creation of rainwater harvesting structures has also resulted in improved financial status of the household. In the absence of any water source nearby, an average amount of INR 2000 to 3000 per month used to be spent by each household, which is saved now. Rainwater harvesting also results in enhanced agricultural productivity and also improvement in the quantum of milk produce that is a direct output of availability of enough fodder and water for cattle. All of these have made substantial improvement in the financial status of people in this region. Apart from these direct financial benefits, there are indirect financial benefits also. With the reduction in drudgery and the consequent improvement in health status of women, young girls and children, expenses on accessing health services have also come down.

While all the women said that their own and the household's financial conditions have improved owing to the water availability, about 90% (301) also acknowledged that their rainwater harvesting has also brought about financial empowerment for women. There were a number of reasons for this financial empowerment of people that are directly linked to the availability of water. It was also observed that the availability of water at the household level has also been optimized by established agro-horti units. These horticulture units have been source of food and nutrition for the people. Not only it results in savings on vegetables and fruits etc., access produced is also sold in market that adds to the family income. It is also important to note that these agro-horti units are largely managed by women, the time saved from drudgery by women is also spent in maintaining and looking after these agro-horti units. Improved financial status of households has been one of the key benefits of rainwater harvesting, and most of the women (290/almost 80%) also said that this has meant financial empowerment for women too. Improved financial status of the RWH beneficiaries was also noted on the basis of the household and per capita income of women, that was about INR 4000 per month, that is relatively better than the per capita income in the rest of the areas nearby where rainwater harvesting has not got introduced.



**Figure 5 - Types of benefits for women: Views of male respondents**

Senior staffs of GRAVIS were also of the view that there has been substantial decrease in the household expenditure on health that is attributable to the availability of clean and safe drinking water available and improvement in hygiene conditions at the households. While it may be difficult to quantify it, there is certainly a positive impact on the financial status of people.

## **Improvement in educational opportunities for young girls**

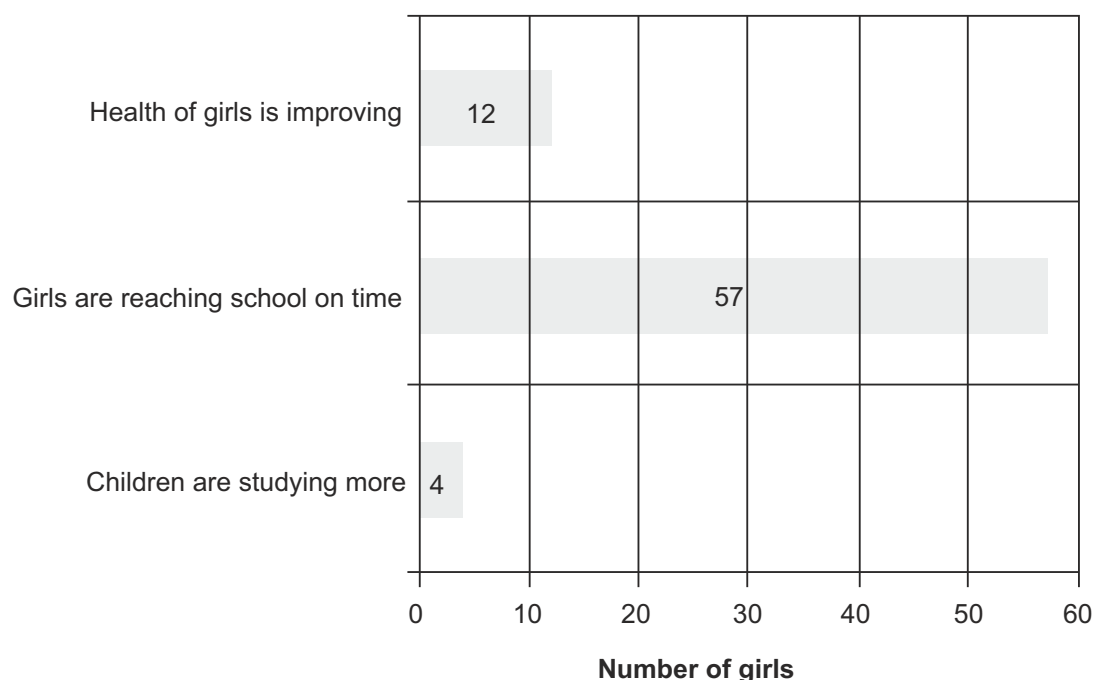
It is very common in the rural areas of the Thar that the young girls lose out on substantial school hours while fetching water for household or assisting in doing so. While girls also do get involved in sibling care and household chores, in rural arid zones drudgery is the major reason that prevents young girls from attending schools. Travel for 5 to 20 kms to fetch water takes away 2-6 hours away from the disposable time. In such circumstances the chances of them attending school remain feeble. Evenif the proportion of time spent is on the lower side, for instance about 2 to 3 hours, girls cannot spend quality time on studies and exhaustion makes it even more difficult.



*Girls in school*

In order to understand the impact of rainwater harvesting on the education of girls, interviews were conducted with young girls too. Average age of the girls interviewed for the study was about 15 years, with minimum age of 8 years to the age and maximum age of 17 years. All of them were going to schools and were studying in standards VI to XI.

All the girls interviewed had been fetching water from far off places and had been spending 3-4 hours per day for the same. They reported that there has been considerable improvement in their health and opportunities for education since there has been access to rainwater harvesting structures at the household level. All the girls interviewed also said that they have been able to go to school regularly because of the availability of water. Almost 63 (90%) girls said that since water is available very close to the house their time is saved, rest of the 7 said that they do not need to go out at all to fetch water now because water source has been made available right inside the premises.



**Figure 6 - Impact of RWH on health**

During the study about all the women reported that young girls have started going to school regularly since they need not spend long hours fetching or assisting in collecting water for the household needs. All the women also responded that girls are able to spend more time for studies even after school and their performance has also witnessed an upward progression. As shown in Figure 5, almost 90% % women were of the view that even the completion rates of schooling among girls have also improved.

Figure 6 further shows the number of women who had different views on the common standard completion of education among girls. Around 133 said that girls are definitely studying in schools upto standard VIII, 102 and 98 women felt that girls are completing V and X grades, respectively.



## Puja and her educational journey

*The classroom was bustling with activities during the break with girls discussing the lessons taught in the previous class. Few girls were immersed in serious talk discussing a problem in mathematics and few others were getting a bit concerned about exams that were round the corner. Puja is busy helping a fellow student understand the science chapter that was taught the previous day.*



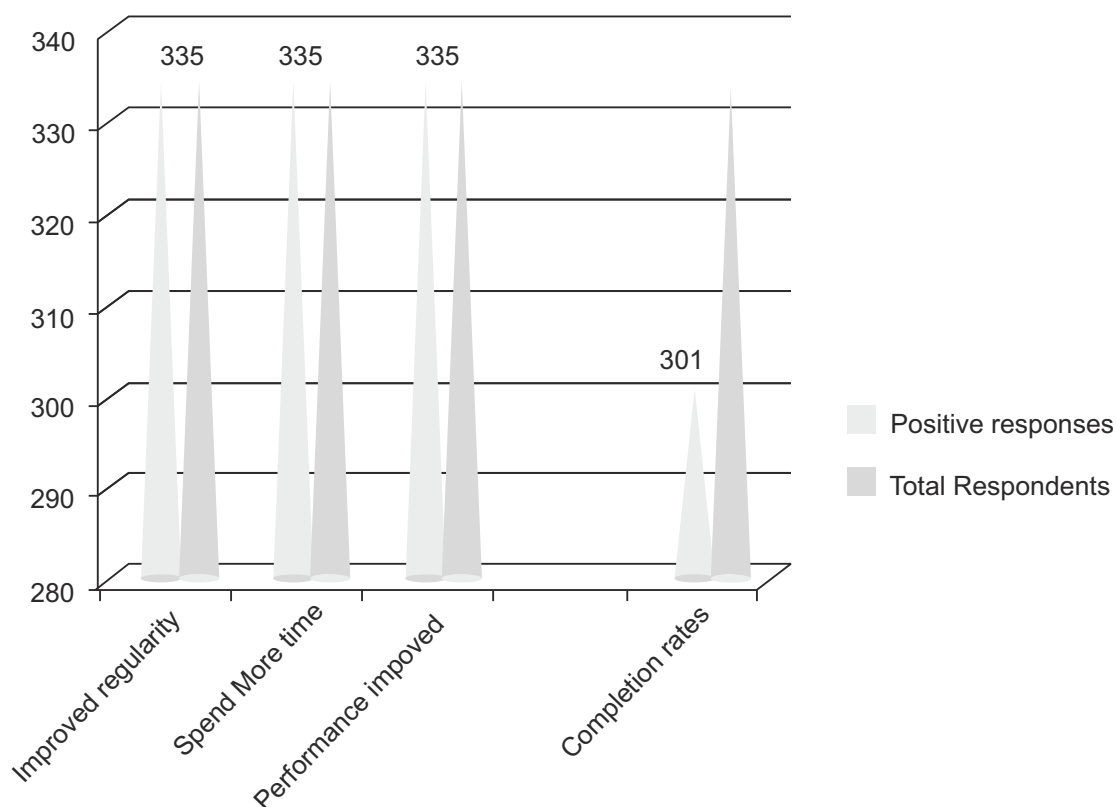
*Puja with her friends in school*

**Puja** is a quite but sharp girl who is in VIII standard. She rides 6 kms to her school on a bicycle in the morning because she says she loves coming to school and attending all the classes, though science is her favourite subject. She gets good grades in her studies and is very much confident of doing well in upcoming examination to be conducted by the state education board for standard VIII.

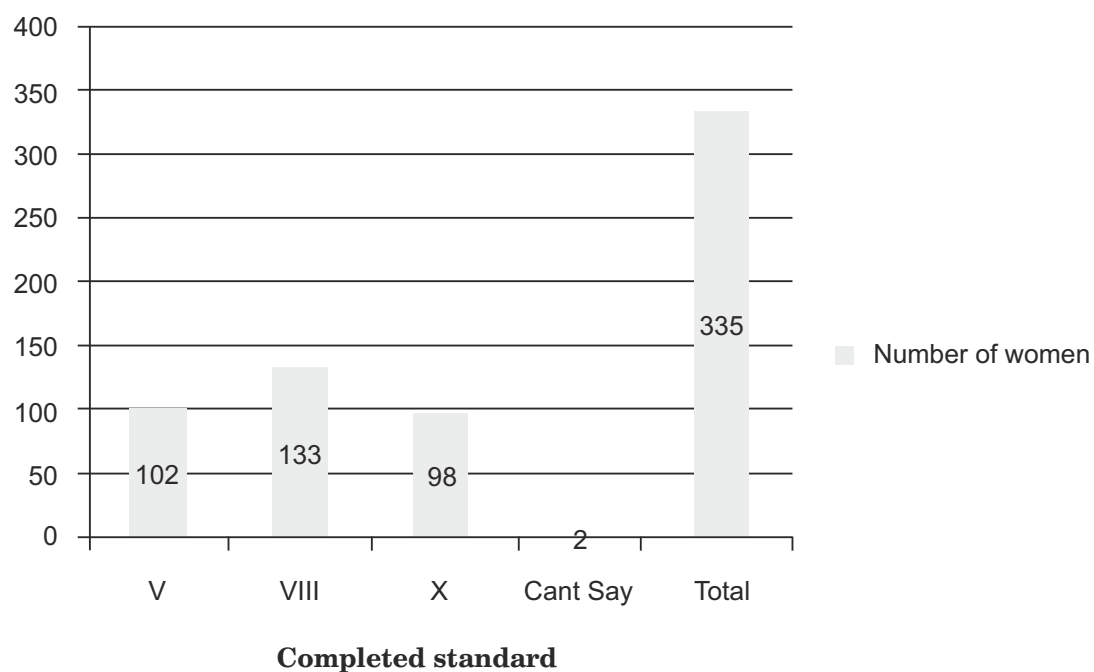
Things were very different for her last few years, almost half the classes used to be over by the time she managed to reach school. Though she used to wake up at 5 in the morning, she had to accompany her mother to fetch water for home. “I used to start at 5.30 in the morning to help my mother with household chores and walk for about 6 kms to reach the well where both of us used to fill our pitchers. We used to walk back 6 kms carrying two pitchers each on our heads. By the time I was back, it used to be 11 am. Even if I rushed to school after that, I was always late and missed atleast three classes. Although our teachers were kind enough to allow me to still attend the classes, I was also always too tired to concentrate on studies after that.

“It was two years ago that we got a taanka constructed within the premises of our house. It gets filled with water during the rains and we have enough water for drinking and cooking. Since then I and my mother have stopped going to fetch water. While she has plenty of time to spend with family, do household work and also socialize with the neighbouring women, she has also become member of a self help group; I am happy that I can reach school on time, do studies at home and even spend some time playing with my friends”, says Puja Kanwar.

She wants to become a teacher and make sure that all girls are studying in school. She said, 'all this is going to be possible only when girls like me are not required to spend hours in carrying water. I hope all the girls in this area have taankas built at their homes'.



**Figure 7 - Impact of rainwater harvesting on girls' education**

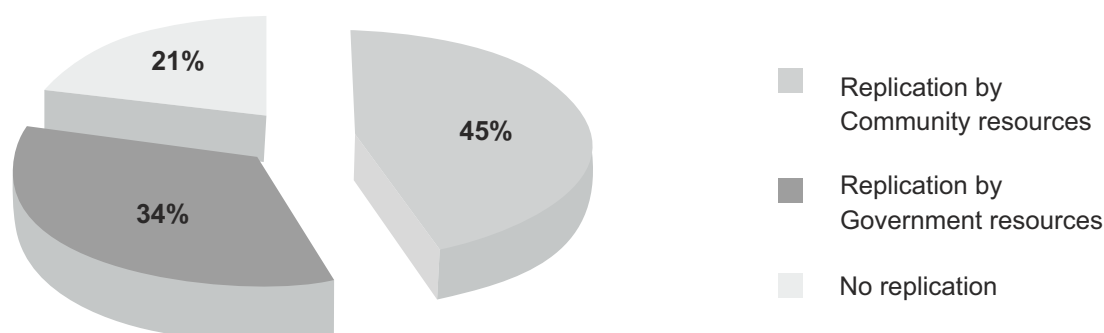


**Figure 8 - Improved completion rates in schools for girls**

228 (68%) out of 335 women also said that because of the enhanced opportunity for education instanced of children getting married before 18 years have also reduced. Apart from women, other research participants – girls, VDC and panchayat members and the local community also reported improvement in the educational opportunity for girls.

## Replication by panchayat/Government

There is sufficient evidence to demonstrate the positive impact of the RWH interventions on the lives of people, especially women. Direct interventions made by GRAVIS has resulted in improved quality of life and the impact of remains long lasting owing to the fact that the structures are addressing the water scarcity related issues permanently. However, the vast geographical area and the population to be covered, require the interventions to get institutionalized and create a ripple effect. Almost 80% of the people interviewed were of the view that the construction of the rainwater harvesting structures has taken place by either community or government resources. 45% respondents said that such replication has taken place with community resources, while 34% of the view that it has been largely supported by the government. In both the cases, replication has meant sustainability of the interventions and also penetration of the rainwater harvesting techniques as well as the culture in the many areas.



**Figure 9 - Replication of RWH interventions**

## Going forward

It is widely recognized that women play a centripetal role in the provisioning, management and safeguarding of water in the household. In water scarce arid rural areas, their role assumes even more importance. Rainwater harvesting and making water available close to the house, has resolved many of the problems for women and opened up several areas of explorations and opportunities. All the women and other research participants including young girls and the male members of the community, suggested expansion of the rainwater harvesting and penetration of RWH structures in other areas too. Women were of the view that such structures have emancipated women and are spearheading women towards social and financial empowerment.

Male members of the community were of the view that there are a number of ways for women to leverage from RWH structures and seek construction of more structures. Since the technical knowhow is being

made available by GRAVIS, women can either raise any issue related to RWH structures in the community meetings or can approach panchayat (local self government) for providing more resources for construction and maintenance. Construction of these RWH structures has also provided with the opportunities to mobilise themselves and many self help groups of women have also been formed as part of the process. SHG members can also pool in resources for construction of such structures.



*Rain fed plantation in Thar*

To make things work better for themselves, women suggested connecting the nearest water sources to their houses so that they do not need to carry water on their heads. Some other women also suggested that there could be pumps at the source of water to avoid pulling the water up from the water storage tank.

Staff members of GRAVIS were of the view that RWH are needed to be seen within the larger social, economic and cultural context and the extreme climatic conditions. RWH is a part of the integrated development strategy that empowers women through improvement in health, education and enterprise. RWH also enables savings, and financial services such as micro credit. However, resourcelessness emanating from extreme poverty prevents them from making any financial contribution to these endeavours. Low literacy rates among women and low level of awareness also act impediments in most cases. However most difficult constraint is the involuntary dependence of women on others. Women have to always seek approval from male members of the family. However, it is to be noted that social norms take much longer than a lifespan to change, however, it is hoped that through rainwater harvesting done in remote impoverished areas, water also becomes an instrument for women's empowerment, instilling and encouraging gender equity in the society.

As a water security intervention, rainwater harvesting has acted as a catalyst for women's life. It has been an emancipator for them from incessant physical strain and has also provided opportunities for their educational and financial progress. With improved health status and access to health services, women are also effectively participating in community life and in political processes. It is important to retain this momentum for a long period of time by simultaneously reaching out to the similar water scarce impoverished communities. Such unremitting efforts in all drought prone areas will be transformative in term of social change, women's empowerment and will contribute towards creating a gender just society, while also keeping the fundamental issue of water scarcity that impacts everyone, at the centre. Further, the importance of replication of the rainwater harvesting models by the community, and especially the local government is of extreme value in bringing about lasting change in lives of people, especially women in the Thar. Continued mobilization, awareness generation and empowerment of community especially women are significant components of the strategy for ensuring water security for entire and also empowering women.



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## ACRONYMS

<b>ANM</b>	Auxiliary Nurse Midwife
<b>ASHA</b>	Accredited Social Health Activist
<b>GRAVIS</b>	GraminVikasVigyanSamiti
<b>PHC</b>	Primary Health Centre
<b>RWH</b>	Rainwater harvesting
<b>SHG</b>	Self Help Group
<b>VDC</b>	Village Development Committee

## GLOSSARY

<i>Taanka</i>	: Taanka is a rainwater harvesting structure constructed at household level and has the capacity to store 18,000 to 20,200 litres of water for household use.
<i>Beri</i>	: Beries are large underground water storage percolators covered with a concrete top and gather ground water during monsoon season. One Beri can store up to 500,000 liters of water. This traditional method of water gathering uses no artificial catchment and holds enough water to sustain a family of 10 for up to two years.
<i>Naadis</i>	: <i>Naadis</i> are village ponds that naturally collect rainwater for entire village. A medium sized naadi provides a community with water for 2-6 months in a year of average rainfall, whereas big ones carry water all year round.
<i>Bio sand filters</i>	: Bio sand filters are used to filter and clean drinking water for the household purpose. These are based on simple technique and are also cost effective.
<i>VDC</i>	: VDC is a voluntary association of village community for administration of the village. VDC is recognized as the basic unit of decentralised governance in India.
<i>ANM</i>	: Auxiliary Nurse Midwife is village level female health worker in India
<i>ASHA</i>	: Accredited social health activist (ASHA) is community healthworkers instituted by the government of India's Ministry of Health and Family Welfare (MoHFW) as part of the National Rural Health Mission
<i>SHGs</i>	: A self-help group (SHG) is a voluntary group of 10 to 20 women in a village. Women join SHG to mobilise themselves and carry out some financial and entrepreneurial activities
<i>PHC</i>	: Primary Health Centre (PHCs) is a state run rural health care facility at the primary level

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## NOTES

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Gramin Vikas Vigyan Samiti (GRAVIS) or Center of People's Science for Rural Development is a non-governmental, voluntary organization that takes a Gandhian approach to rural development by working with the poor of the Thar Desert to enable them to help themselves. Since its inception in 1983, GRAVIS has worked with over 60,000 desert families across over 1300 villages in India reaching a population of over 1.3 million, and has established over 2,900 Community Based Organizations (CBOs). Through its dedicated field work, as well as its research and publications, GRAVIS has come to occupy a leading position amongst the voluntary organizations in India.



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