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To Assess the Impact of Rain Water Harvesting (RWH) in Nagaur

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Certificate

This is to certify that Pooja Saini has under gone summer training in **India Bulls Foundation** from 16 April to 1 June, 2012.

The candidate carried out all the studies related to the summer training. Her approach to the studies has been sincere, scientific and analytical. This summer training in partial fulfillment of the course requirement is recommended for the award of Postgraduate Diploma in Rural Management.

I wish Her Success in all future endeavors.

Dr.P.R. Sodani

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I express my deep sense of gratitude to local people also.

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List of Abbreviations

APL - Above poverty line

BPL – Below poverty line

SC – Schedule caste

ST – Schedule tribe

OBC – Other backward caste

Gen – General

SWN- Safe water network

IBF – India bulls foundation

RWH – Rain water harvesting

NREGA – National rural employment guarantee assurance

CHAPTER 1

Introduction

1.1a) Introduction:

Nagaur District is situated between 26°25' & 27°40' North Latitude & 73°.10' & 75°.15' East Longitude. The district is bounded by Bikaner District to the northwest, Churu District to the north, Sikar District to the northeast, Jaipur District to the east, Ajmer District to the southeast, Pali District to the south, and Jodhpur District to the southwest and west.

The district lies in the Marwar region of Rajasthan, in the North western thorn scrub forests belt surrounding the Thar Desert. The Aravalli Range extends across the south eastern portion of the district, and the saline Sambhar Lake, India's largest salt lake and Rajasthan's largest lake, lies at the southwestern corner of the district, straddling the boundary with Jaipur District.

The district consists 10 tehsils. These are Nagaur, Khinvsar, Jayal, Merta, Degana, Didwana, Ladnun, Parbatsar, Makrana and Nawa. Except Khivnsar all of these are Sub-divisions also. There are 11 blocks and 1607 villages in the district.

According to the 2011 census Nagaur district has a population of 3,309,234 Its population growth rate over the decade 2001-2011 was 19.25 %. Nagaur has a sex ratio of 948 females for every 1000 males, and a literacy rate of 64.08 %.

It is the honour of Nagaur city of being selected as the place in the country from where the Democratic Decentralization process was initiated by the late Shri Jawaharlal Nehru, the first Prime Minister of India on the 2 October 1959 after independence.

Nagaur is famous for its cattle fair being the organizer of huge bullock camel fair "Ramdev Pasumela" every year in the month of February. It has got plenty of natural resources like Limestone, Salt and other type of Stones.

1.1b) Climatic Conditions

The climate of Nagaur is very dry with hot summers. Sand storms are obvious in summer. The climate of the district is noticeable by extreme dryness, large variations of temperature & highly variable rainfall. The heat and temperature keeps on rising intensely from March till June which are the hottest months of the year. The maximum

and the minimum recorded temperature in district are 470 C and 00 C respectively. The average temperature of the district is 23.50 C. The winter season starts from mid November and ends till the beginning of March. The short duration of rainy season extends from July to mid September. The average rainfall in the district is 36.16 cm with 51.5 % humidity.

1.1c) Connectivity to Nagaur

Nagaur Rail Way Station 0 KM near
Badwasi Rail Way Station 16 KM near
Marwar Mundwa Rail Way Station 19 KM near
Shri Balaji Rail Way Station 34 KM near

No surface water resource in district has been reported except a few salt lakes. There is salt lake (Sambhar Lake) at south west of Didwana having an area of 777 hectare The Nawa tehsil also shares a part of well known Sambhar Lake in Jaipur district. There are eight (8) numbers of ponds in the district. Out of these 5 are in Degana and 3 in Parbatsar blocks.

Ground water is only source of irrigation in the district. The ground water development in the district is being done by dug wells and tube wells.

1.1c) Connectivity to Nagaur

Nagaur Rail Way Station 0 KM near

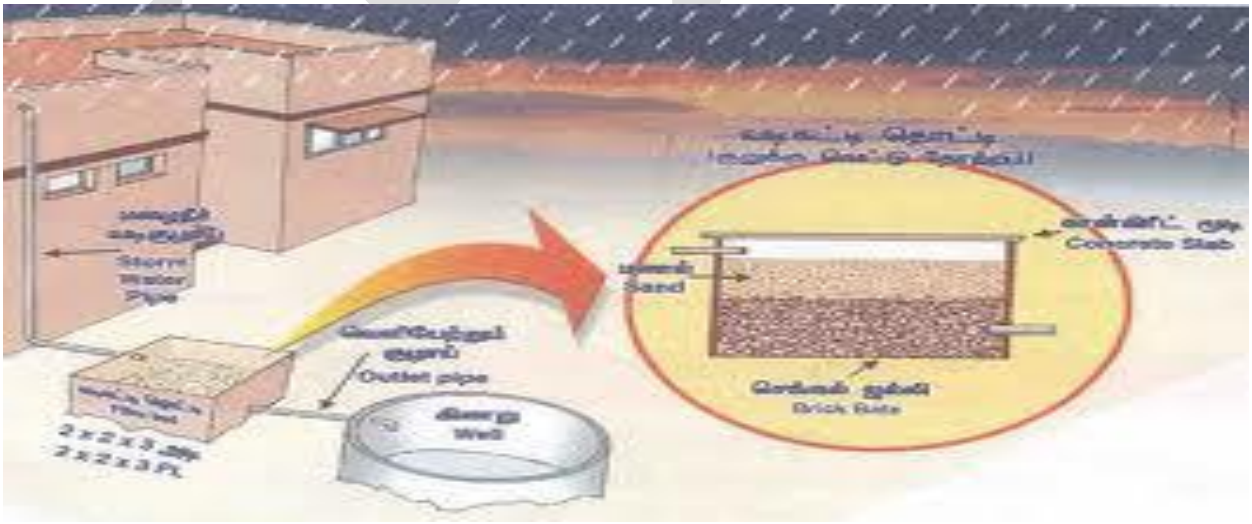
Badwasi Rail Way Station 16 KM near

Marwar Mundwa Rail Way Station 19 KM near

Shri Balaji Rail Way Station 34 KM near

3.1a) Rainwater harvesting

System of collection rainwater and conserving for future needs has traditionally been practiced in India. The traditional systems were time-tested wisdom of not only appropriate technology of Rainwater Harvesting, but also water management systems, where conservation of water was the prime concern. Traditional water harvesting systems were Bawaries, step wells, jhiries, lakes, tanks etc. These were the water storage bodies to domestic and irrigation demands. People were themselves responsible for maintenance to water sources and optimal use of water that could fulfil their needs.



What is rainwater harvesting?

The term rainwater harvesting is being frequently used these days, however, the concept of water harvesting is not new for India. Water harvesting techniques had been evolved and developed centuries ago.

Ground water resource gets naturally recharged through percolation. But due to indiscriminate development and rapid urbanization, exposed surface for soil has been reduced drastically with resultant reduction in percolation of rainwater, thereby depleting ground water resource. Rainwater harvesting is the process of augmenting the natural filtration of rainwater in to the underground formation by some artificial methods. "Conscious collection and storage of rainwater to cater to demands of water, for drinking, domestic purpose & irrigation is termed as Rainwater Harvesting."

1.3 b)Need to Water Harvesting :

The scarcity of water is well known fact. Most of the rain falling on the surface tends to flow away rapidly, leaving very little amount for the recharge of groundwater. As a result, it was found that most parts of India experience lack of water ven for domestic uses.

Surface water sources fail to meet the rising demands of water supply; ground water reserves are being tapped and over exploited resulting into decline in ground water levels and deterioration of ground water quality. This precarious situation needs to be rectified by immediately recharging the depleted aquifers.

Roof top rainwater harvesting is the deliberate collection and storage of rainwater that runs off on roof top areas. The amount of water harvested depends on the frequency and intensity of rainfall catchment characteristics, water demands and how much run off occurs and how quickly. Harvested rain water was being stored in sub surface ground water reservoir (locally called tanki).

The main objective of such roof top rain water harvesting is to make water (specially drinking) available for future use. Capturing and storing rain water in water storage individual tank to meet the drinking water for a family of average size throughout the year.

- To arrest ground water decline and augment ground water table

- To beneficiate water quality in aquifers
- To conserve surface water runoff during monsoon
- To reduce soil erosion
- To inculcate a culture of water conservation

1.3 c) Practical Advantages of RWH

- Availability not subject to outside utility control
- Not subject to pipelines interruption (seismic)
- Quality is controlled by the consumer
- Available even when power is interrupted
- Reduces run-off and erosion
- Available even when storms & disaster strike
- Available immediately for fire suppression
- Reduces mosquito breeding grounds (Dengue Fever)
- Thermal mass can naturally cool buildings
- Ideal for people on low sodium diets or with health concerns (weakened immunity systems)
- To meet the ever increasing demand for water. Water harvesting to recharge the groundwater enhances the availability of groundwater at specific place and time and thus assures a continuous and reliable access to groundwater.
- To reduce the runoff which chokes storm drains and to avoid flooding of village roads.
- To reduce groundwater pollution and to improve the quality of groundwater through dilution when if recharged to groundwater thereby providing high quality water, soft and low in minerals.
- Provides self sufficiency to water supply and to supplement domestic water requirement during summer and draught conditions.
- It reduces the rate of power consumption for pumping of groundwater.
- In desert where rainfall is low, rainwater harvesting has been providing relief to people.

1.3d) Qualitative Advantage of RWH

- naturally pure
- naturally soft (no dissolved minerals)
- free for those who collect it
- sustainable
- free of chlorine and its by products
- free of pesticides and other man-made contaminants

1.3e) Precautionary measures to be taken while Harvesting Rainwater

- Roof or terraces uses for harvesting should be clean, free from dust, algal plants etc.
- Roof should not be painted since most paints contain toxic substances and may peel off.
- Do not store chemicals, rusting iron, manure or detergent on the roof.
- Nesting of birds on the roof should be prevented.
- Terraces should not be used for toilets either by human beings or by pets.
- Provide gratings at mouth of each drainpipe on terraces to trap leaves debris and floating materials.
- Provision of first rain separator should be made to flush off first rains.
- Do not use polluted water to recharge ground water.
- Ground water should only be recharged by rainwater.
- Before recharging, suitable arrangements of filtering should be provided.
- Filter media should be cleaned before every monsoon season.
- During rainy season, the whole system (roof catchment, pipes, screens, first flush, filters, tanks) should be checked before and after each rain and preferably cleaned after every dry period exceeding a month.
- At the end of the dry season and just before the first shower of rain is anticipated, the storage tank should be scrubbed and flushed off all sediments and debris.

1.3f) Components of rainwater harvesting system

A rainwater harvesting system comprises components of various stages - transporting rainwater through pipes or drains, filtration, and storage in tanks for reuse or recharge. The common components of a rainwater harvesting system involved in these stages are illustrated here.

1. **Catchments**: The catchment of a water harvesting system is the surface which directly receives the rainfall and provides water to the system. It can be a paved area like a terrace or courtyard of a building, or an unpaved area like a lawn or open ground. A roof made of reinforced cement concrete (RCC), galvanised iron or corrugated sheets can also be used for water harvesting.

2. **Coarse** mesh at the roof to prevent the passage of debris

3. **Gutters**: Channels all around the edge of a sloping roof to collect and transport rainwater to the storage tank. Gutters can be semi-circular or rectangular and could be made using:

- Locally available material such as plain galvanised iron sheet (20 to 22 gauge), folded to required shapes.
- Semi-circular gutters of PVC material can be readily prepared by cutting those pipes into two equal semi-circular channels.
- Bamboo or betel trunks cut vertically in half.

The size of the gutter should be according to the flow during the highest intensity rain. It is advisable to make them 10 to 15 per cent oversize.

Gutters need to be supported so they do not sag or fall off when loaded with water. The way in which gutters are fixed depends on the construction of the house; it is possible to fix iron or timber brackets into the walls, but for houses having wider eaves, some method of attachment to the rafters is necessary.

4. **Conduits:** Conduits are pipelines or drains that carry rainwater from the catchment or rooftop area to the harvesting system. Conduits can be of any material like polyvinyl chloride (PVC) or galvanized iron (GI), materials that are commonly available.

5. **First-flushing**: A first flush device is a valve that ensures that runoff from the first spell of rain is flushed out and does not enter the system. This needs to be done since the first spell of rain carries a relatively larger amount of pollutants from the air and catchment surface.

6. **Filter**: The filter is used to remove suspended pollutants from rainwater collected over roof. A filter unit is a chamber filled with filtering media such as fibre, coarse sand and gravel layers to remove debris and dirt from water before it enters the storage tank or recharges structure. Charcoal can be added for additional filtration.

(i) Charcoal water filter: A simple charcoal filter can be made in a drum or an earthen pot. The filter is made of gravel, sand and charcoal, all of which are easily available.

(ii) Sand filters: Sand filters have commonly available sand as filter media. Sand filters are easy and inexpensive to construct. These filters can be employed for treatment of water to effectively remove turbidity (suspended particles like silt and clay), colour and microorganisms.

In a simple sand filter that can be constructed domestically, the top layer comprises coarse sand followed by a 5-10 mm layer of gravel followed by another 5-25 cm layer of gravel and boulders.

1.3 g) Policy implication on promotion of rain water harvesting

In order to reduce the water demand, ain water harvesting both in individual houses and on community basis shall be required to be taken up on a large scale. Similarly, massive action for artificial recharge of the ground water aquifer on community basis in a village shall be required. All new schemes shall make provisions for taking up these works. The following guidelines may be followed to achieve these aims:

- Roof top/ground level water harvesting should be taken up in individual households by providing necessary subsidies so as to make them self sufficient on drinking water for their family throughout the year. The beneficiary family shall contribute towards labour component of the work so that it develops a sense of ownership of the assets so created.

- Some community tankas or rehabilitation of traditional community kund may also be constructed wherever possible so that surplus rainwater of a village can be utilizes by the households not having water kund and also during critical period of drought.
- The local village water and sanitation committee should be formed and empowered to loo after the up keep of such community assets and impose a ban on taking out or pimping out of rain water from such tankas and transporting it to their individual household storage tanks.
- Wherever possible individual households shall be encouraged to construct water harvesting tankas in a tie up with NREGA or other development programmes.
- Community should be encouraged to take up measures to use surplus rain water of their household for recharge purposes.

Surplus rain water of a village shall be impounded in an already existing nadi/ johar/ local talab for storage.

Objectives of the project

- To provide safe water for rural resident in the villages of nagaur district.
- To document the evidence based research on RWH and to further up scale in 1300 villages of Nagaur district.
- To build on experience and lessons learnt from the SWN supported project at churu district.
- To encourage community to take up measures to use surplus rain water of their household for recharge purposes.
- To construct sanitation unit and to develop other sanitation habits among the community.
- To meet the increasing demand of water.
- To reduce run off.
- To avoid flooding of roads.
- To augment the groundwater storage and to raise the water table.
- To reduce groundwater pollution.
- To improve the quality of groundwater.

- To supplement domestic water requirement during summer and long dry spells.

Rationale: Impact studies are undertaken to study the positive and negative results of certain project. Impact assessment is also done to find out the results or effects of a scheme before it was introduced and after it was introduced. For planners and policy makers such assessment helps to understand the effects of specific projects implemented and can give guidance to policy makers to implement the project in other areas also.

Chapter 2

Objectives of Study

The objectives of study are:

- To assess the impact of RWH project of IBF in different villages of Nagaur.
- To measure satisfaction level of beneficiaries on ground of social, economic, health and sanitation issues.
- To understand the social and demographic profile of the project villages that is how people live together and organize themselves within their community
- To find out the awareness of villagers regarding hygiene and keeping water clean and safe for drinking purpose.

Chapter 3

Research Methodology

3.1 The Research Methodology followed for data collection would be as follows:

- **Study Type-** Exploratory
- **Study Population-** Each 5-5 villages of Didwana and Ladnu block in District.
- **Sample Size-** 198 (173 male and 25 female) respondent**.**
- **Sample Design-** Simple random sampling was used.
- **Sample technique-** In depth interview
- **Sample tool-** A questionnaire was prepared for villagers to measure the benefits and impact of this project

Strategy- The overall strategy of research adopted in this impact study was survey method. The sample of 198 people was selected out of 385 and they were surveyed with the help of questionnaire.

Population- 5-5 villages of each Didwana and ladnu block of Nagaur district.

Sample- Two hundred beneficiaries were surveyed in this research. Approximately 50% beneficiaries were selected from each village where project was run.

The combined of secondary data analysis and field visit to the project area to assess potential risks that affected the quality of the stored rain water. Detailed household questionnaire were developed and tested. The survey collected the information on demographic conditions, social, economic situations of beneficiaries in the project areas.

3.2 Comparing social economic and health indicators of the beneficiaries before and after the project.

Ladnu block:

In ladnu block 5 villages were selected for the RWH project which is as follows:

1. Loadsar
2. Tanwara
3. Jaislan

4. Bithooda
5. Dhyawa

In Didwana block 5 villages which were selected for RWH project are as follows:

1. Singhana
2. Madam
3. Supka
4. Thanu
5. Chak khardiya

Chapter 4

Data Analysis and Observations

4.1 Demographic

No. of villages	Number of respondents surveyed	Out of total beneficiaries	Percentage	Total population
Loadsar	17	30	56.7	2000
Tanwra	33	52	63.5	3500
Jaislan	14	26	53.8	2500
Bithooda	10	18	55.6	5000
Dhyawa	42	95	44.2	4000
Thanu	10	19	52.6	1500
Supka	11	20	55	4000
Madam	23	45	51	2000
Singhana	25	50	50	2000
Chak khardiya	13	25	52	1000

4.2 Social Issue

Table 1: Sex of the respondents

Sex	No. of respondents	Percentage
Male	173	87.4
Female	25	12.6

From the Table 1. analysis it was found that 87.4% respondents were male while only 12.6% female responded the questionnaire.

Table 2: Category of respondents

Category	No. of respondents	Percentage
APL	76	38.4
BPL	122	61.6

In above Table 2. analysis shows that majority of 61.6% of respondents belong to Below poverty line (BPL) while rest 38.4% belong to Above poverty line (APL).

Table 3: Caste of respondents

Caste	No. of respondents	Percentage
SC	94	47.5
ST	6	3
OBC	41	20.7
General	57	28.8

Table 3 . analysis of caste shows that most dominant caste of respondents is Schedule Caste (Sc) 47.5% , another is general consisting of 28.8% , then is Other backward caste (OBC) having 20.7% and the lowest is Schedule tribe(ST) having 3%.

Table 4: Education of respondents

Education	No. of respondents	Percentage
Literate	45	22.7
Illiterate	108	54.5
1-5	9	4.5
5-10	16	8
Above 10	16	8

Above table 4 shows the educational level of respondents , among which illiterate respondents are maximum 54.5% , literate respondents are 22.7% , then some of the respondents are secondary educated and above secondary educated each 8-8%. Only 4.5% of respondents are educated between 1-5 standard.

Table 5: Occupation of respondents

Occupation	No. of respondents	Percentage
Agriculture	131	66.2

Skilled labour	33	16.7
Unskilled labour	7	3.5
Government service	3	1.5
Private service	23	11.6
Unemployed	1	.5

From table 5 it can be seen that 66.2% respondent do agriculture work. 16.7% respondents are skilled labour, 11.6% are doing private service while 3.5% respondents are unskilled labour , Only 1.5% respondents are in government service and .5% is unemployed.

Table 6. Type of family

Family type	**No. of respondents**	**Percentage**
Nuclear	130	65.7
Semi-Nuclear	5	2.5
Joint family	62	31.3

From table 6 It can be seen that in villages also nuclear family exist in majority 65.7% , 31.3% respondents resides in joint family and 2.5% in semi-nuclear family.

Table 7: No. of Family members

Family members	**No. of respondents**	**Percentage**
2	5	2.5
4	33	16.7
6	33	16.7
8	23	11.6
Above 8	27	13.6
Others	74	37.4

From table 7 majority of respondents 37.4% belong to other then given no. Family size of 4-6 members consists of 16.7%-16.7% respectively. Then

respondents of family comprising of 8 and more than 8 members is 11.6% and 13.6%respectively.Only 2.5% respondents belong to family size of 2.

Table 8: Male members

Male members	No. of respondents	Percentage
1	18	9
2	50	25
3	59	29.8
4	37	18.7
5	18	9
6	6	3
Others	7	3.5

From table 8 we can make analysis that 3male member in family is maximum 29.8%. 2 male member in family is having 25%.18.7% respondents are having 4 male members in their family.1 and 5 male members in family occupies 9 -9% respectively. Others comprises of 3.5%.

Table 9. Female members

Female members	No. of respondents	Percentage
1	25	12.6
2	62	31.3
3	53	26.8
4	32	16.2
5	15	7.5
6	5	2.5
Others	5	2.5

From table 9 analyses can be made out that 31.3% respondents have 2 females in their family, 26.8% have 3 females , 16.2% have 4 females , 12.6% have 1 female member in family. 7.5% have 5 females in family. 2.5% - 2.5% families have respectively 6 and other no. of females.

4.2 a) Structure (tankas)

Figure 1:

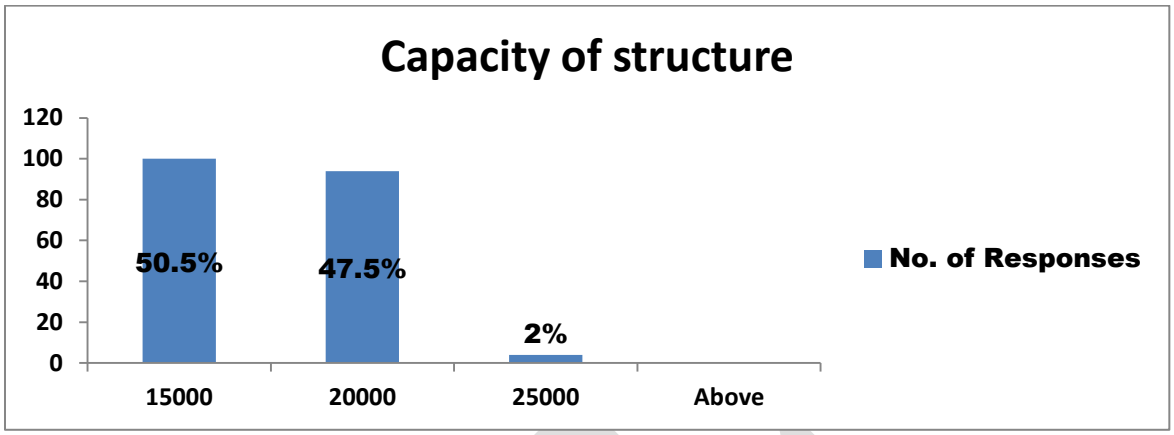


Figure 1: Interprets that capacity of structure for storing water is made of equal capacity as 50.5% respondents says their structures capacity is 15000 litre.47.5% respondents have tankas capacity of 20000 litre. Only 2% have 25000 litres capacity.

Figure no. 2:

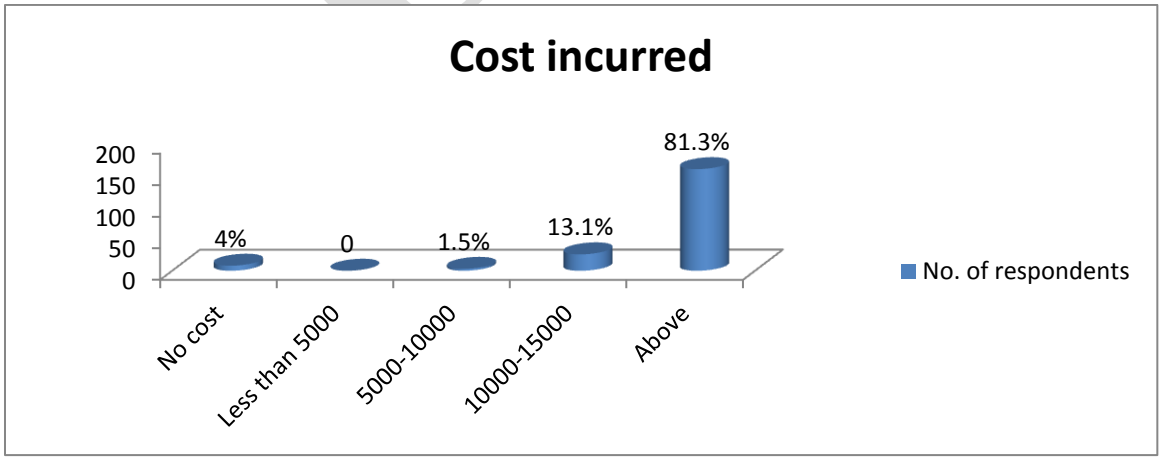
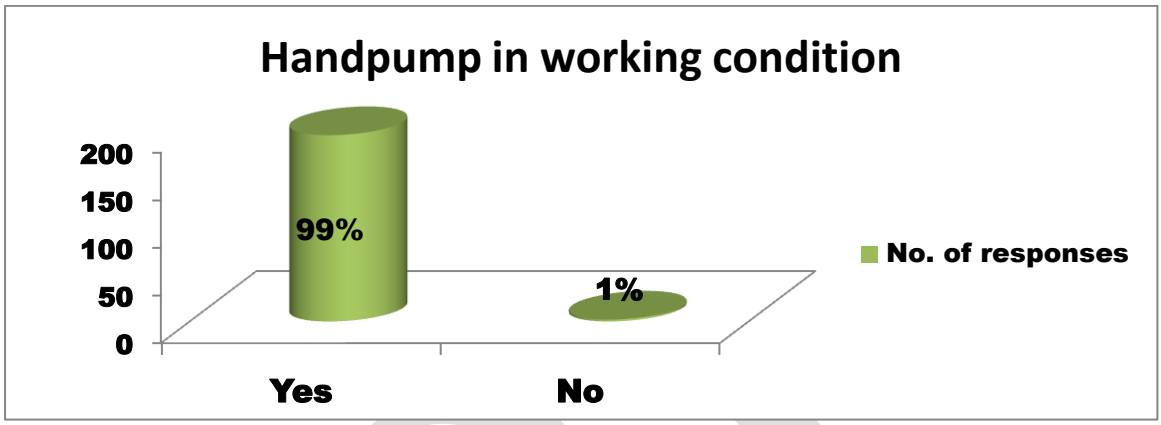


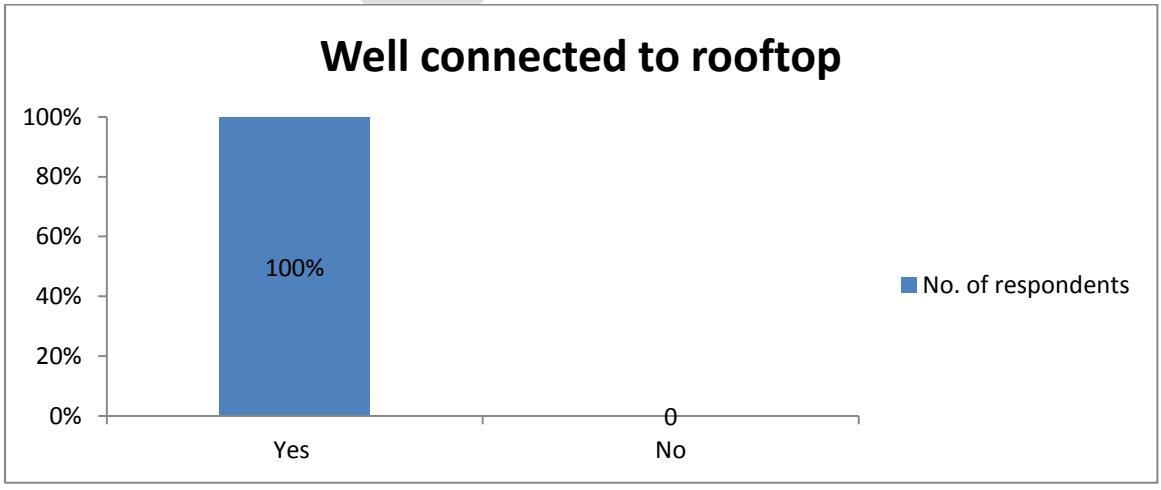
Figure no. 2: It can be analysed 81.3% respondents incurred cost above than Rs15000.13.1% incurred between 10000-15000rs. 1.5% respondents between 5000-10000rs. And remaining 4% did not incurred any cost as they got fully financial support from IBF.

Figure no. 3.



Interpretation of fig 3. Is that 99% respondents replied that Yes their hand pump are in working condition whereas 1% responded they are not in working condition.

Figure 4.



From fig 4 we can interpret that 100% tankas are connected to rooftop**.**

Figure no. 5:

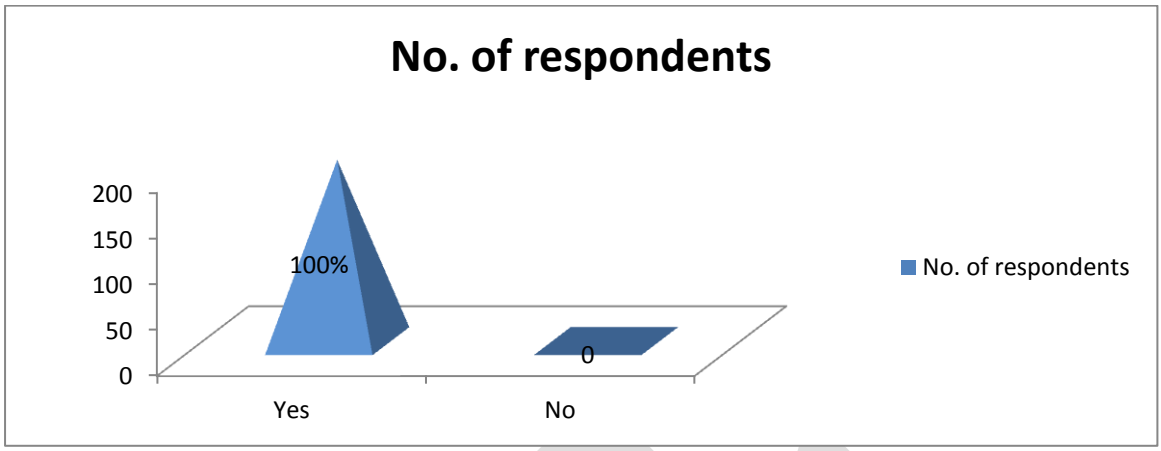
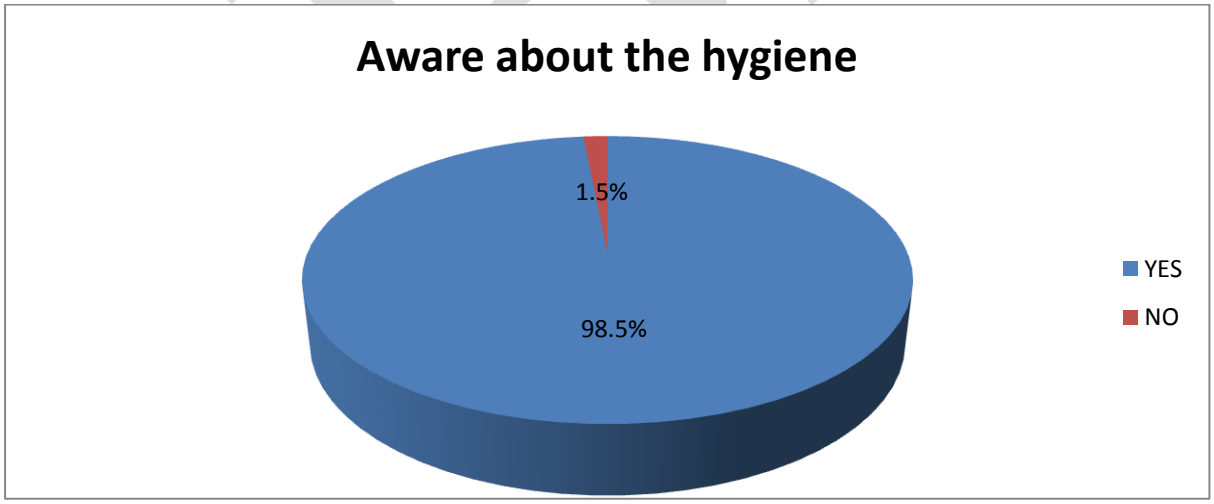


Fig 5: also interpret that 100% beneficiaries responded they are using filter chambers properly.

Figure no. 6:



Through fig 6 we can interpret that 98.5% respondents are aware of hygiene and only 1.5% are unaware of it.

Figureno.7:

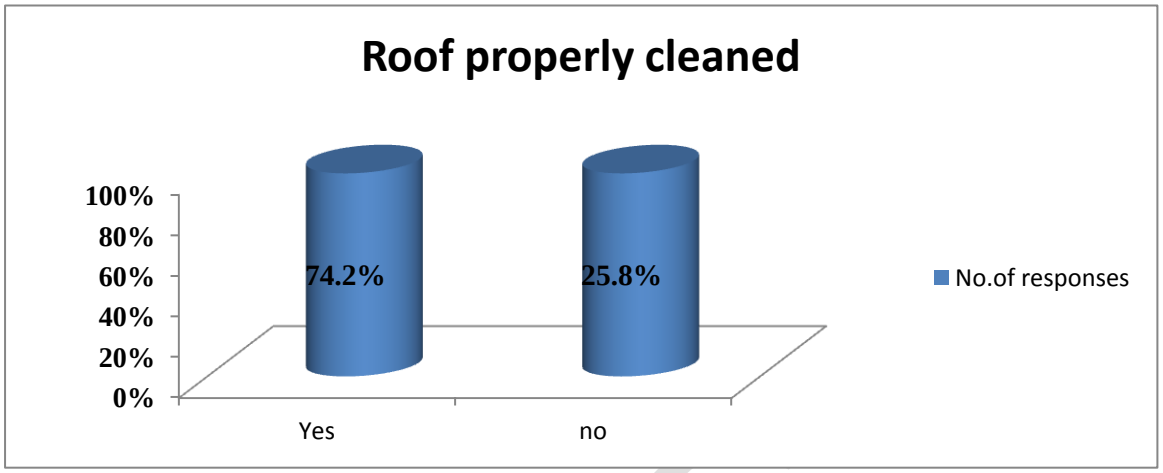
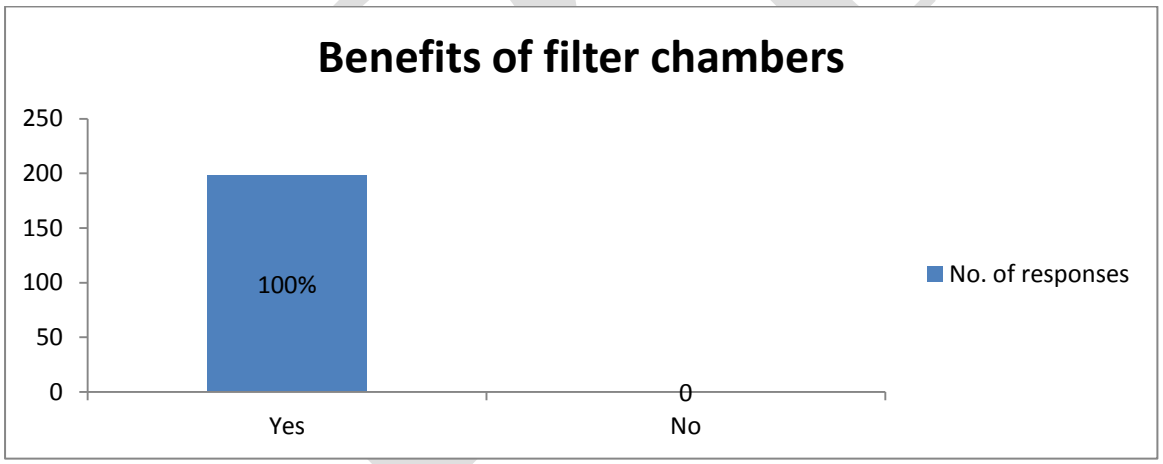


Figure no. 7:gives interpretation that 74.2% beneficiaries clean their roof properly while 25.8% do not clean their roof frequently.

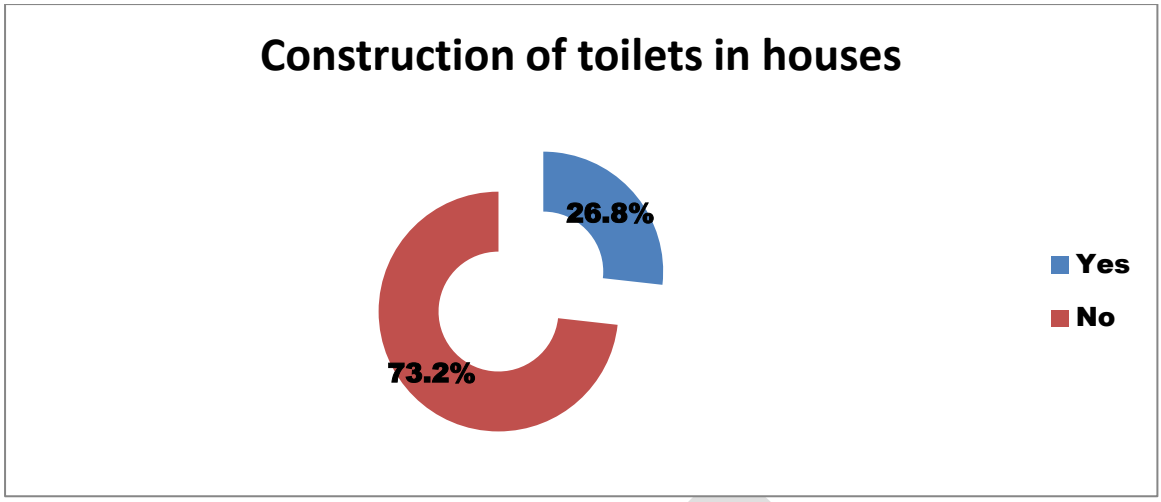
Figure no. 8:



From fig 8 we can make out 100% respondents are aware of filter chambers.

4.2 b) Sanitation

Figure no. 1 : Construction Of Toilets In Houses

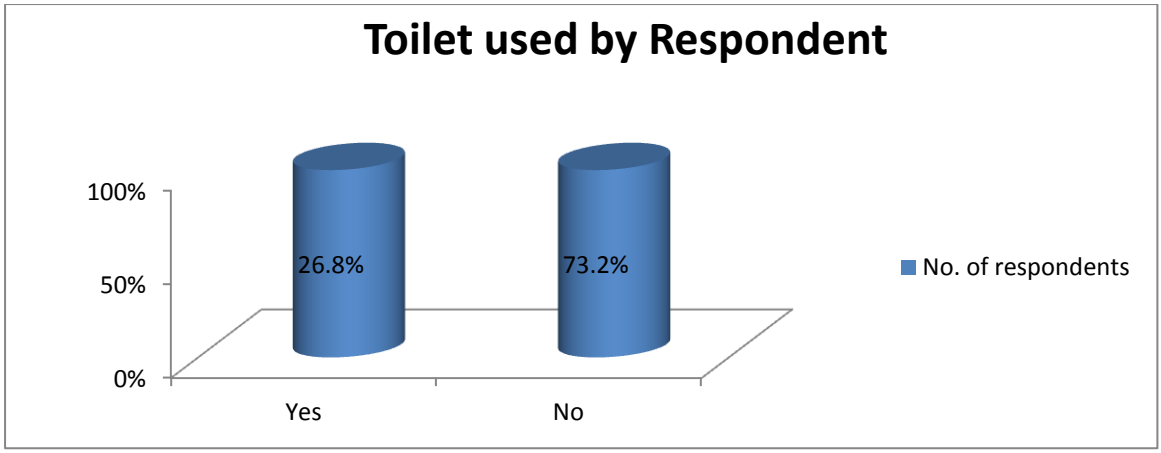


From figure 1 we can analyse that only 26.8% respondent have toilets constructed in their houses and rest 73.2% does not have toilets.

Figure no. 2:

Fig 2 analyse that out of 53 toilets in all 10 villages only 19.7% toilets are clean. There is no toilet in chak khardiya village.

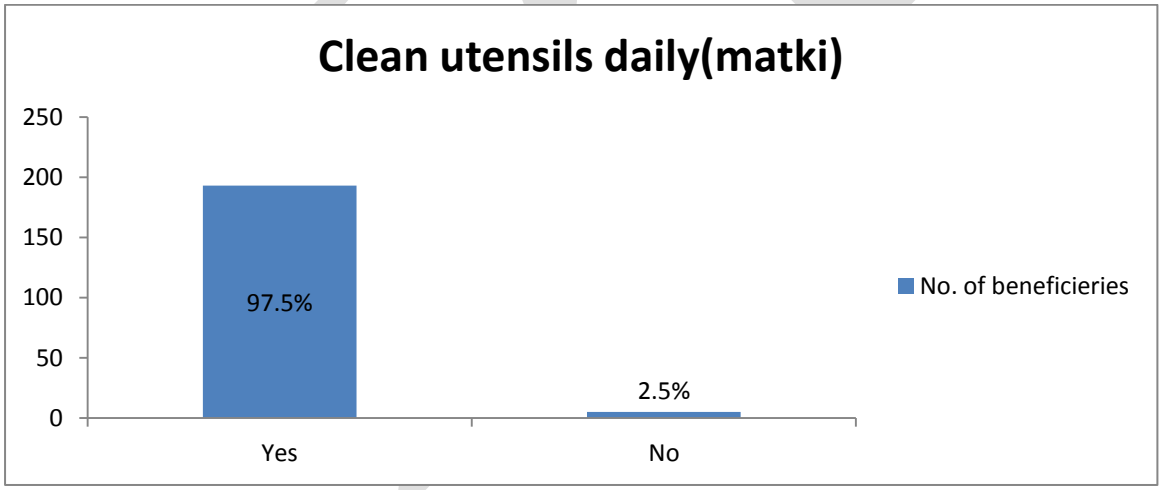
Figure no. 3:



From fig 3. We can make out that all toilets which are constructed are used by 26.8% respondents.

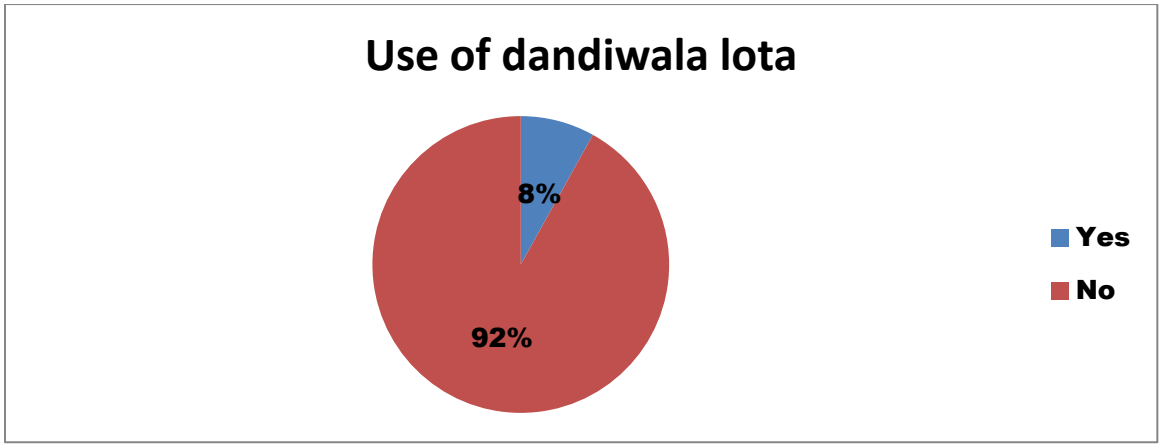
4.2 c) Health related issues

Figure 1.



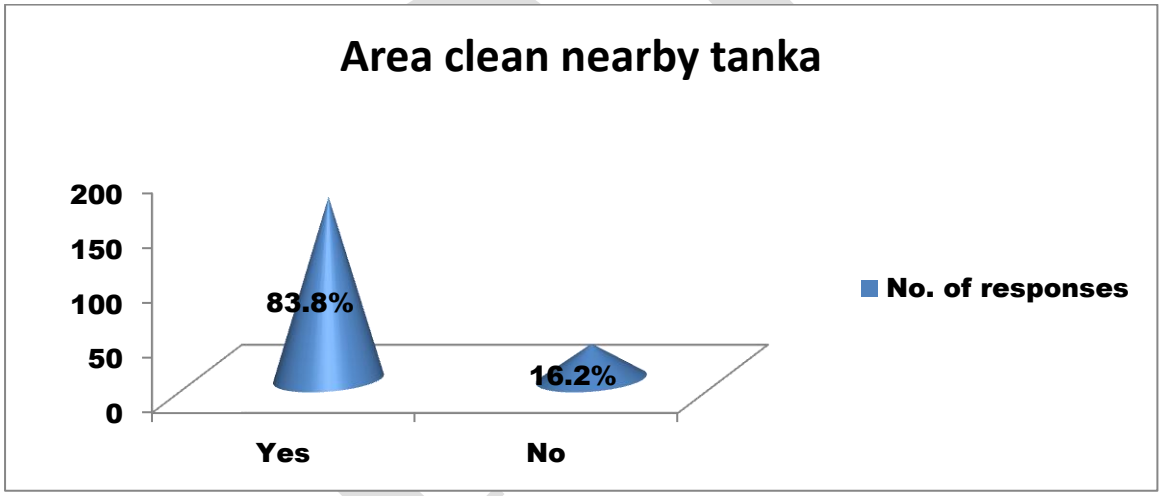
By fig 1. We can interpret that 97.5% respondents clean their utensils daily before storing drinking water into it.

Figure 2.



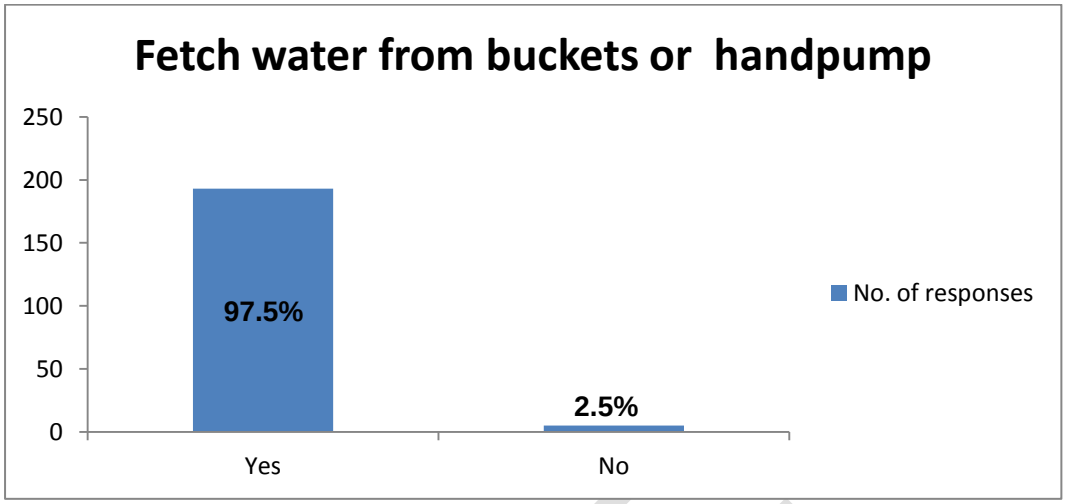
From Fig 2. Interpretation is made out that only 8% respondents who belongs to madam village only uses dandiwala lota as they are been given these lota by IBF. And rest of the 92% respondents do not have dandiwala lota.

Figure 3.



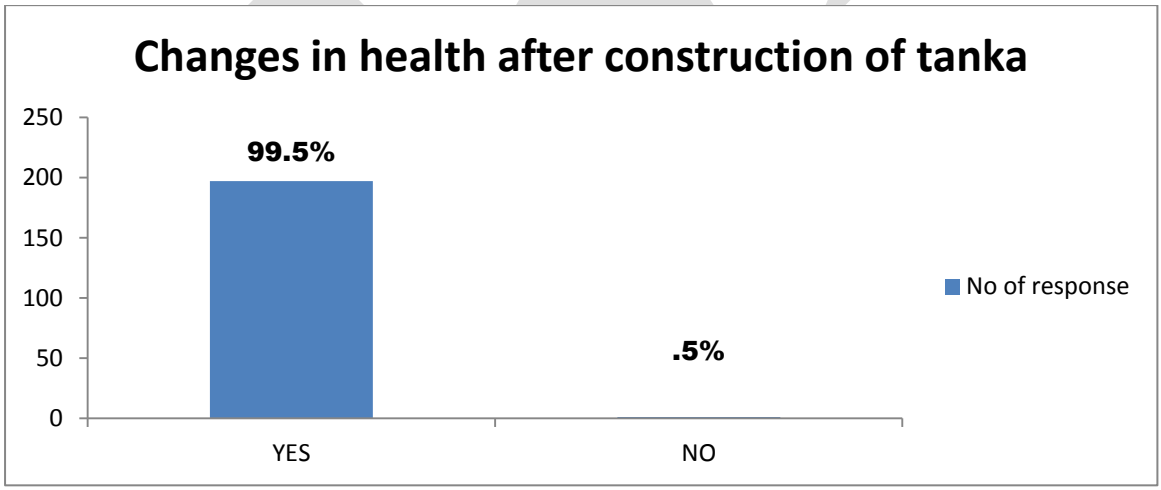
83.8% respondents keep the area clean nearby tankas while 16.2% do not clean that area.

Figure 4.



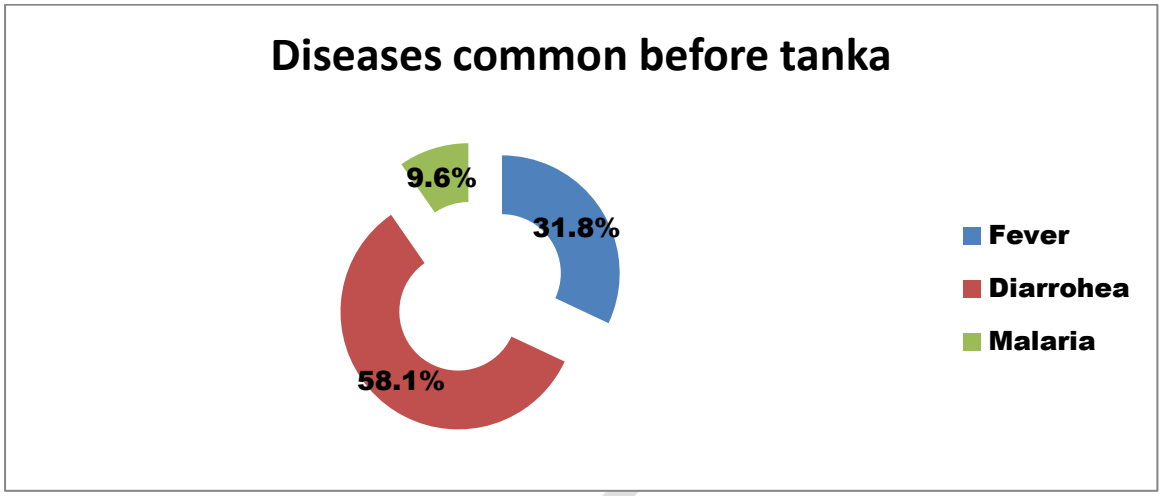
From fig 4. We analyse that 97.5% respondents fetch water from hand pumps while rest 2.5% use buckets because of level of water goes down in tank or hand pump is not working.

Figure 5.



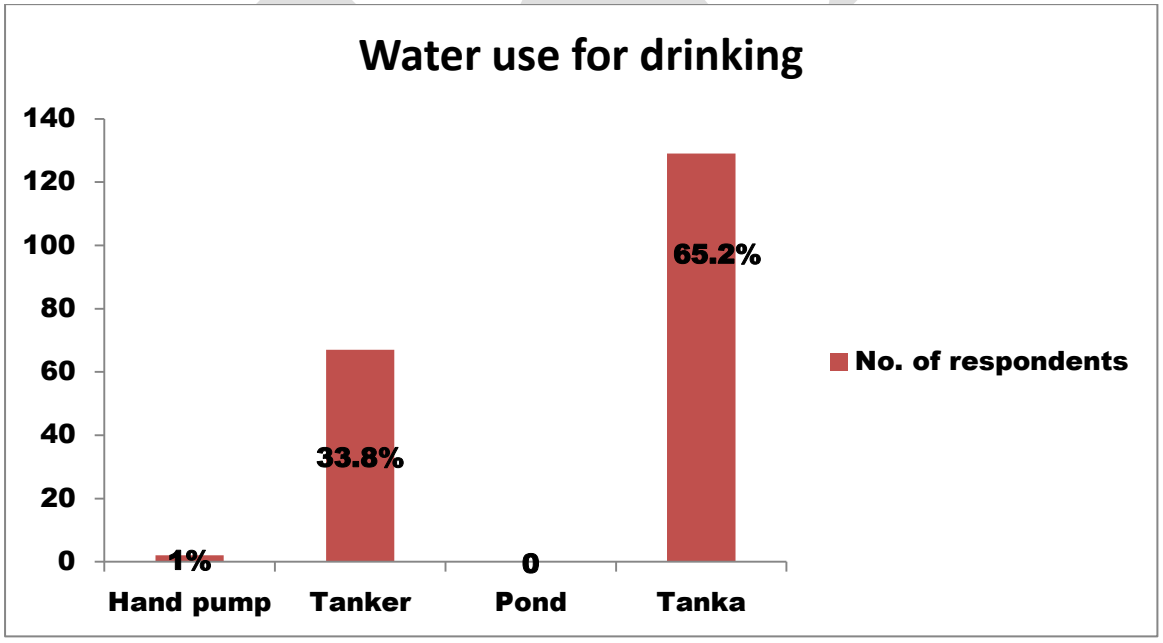
From above fig we can understand that 99.5% respondents have found changes in health after construction of tankas. while rest .5% did not found any changes.

Figure no .6:



From fig 6 interpretations is coming that most frequently before construction of tankas 58.1%children and villagers use to suffer from diarrhoea, 31.8% from fever and rest 9.6% from malaria. All this was due to water they have to drink which is very saline.

Figure 7.



From fig 7. We can interpret that 65.2% respondents use water for drinking from tanka, 33.8% respondents from tanker and remaining 1% from hand pump. People do not use pond water as pond available in Supka village contains water which is very poisonous .

Figure 8.

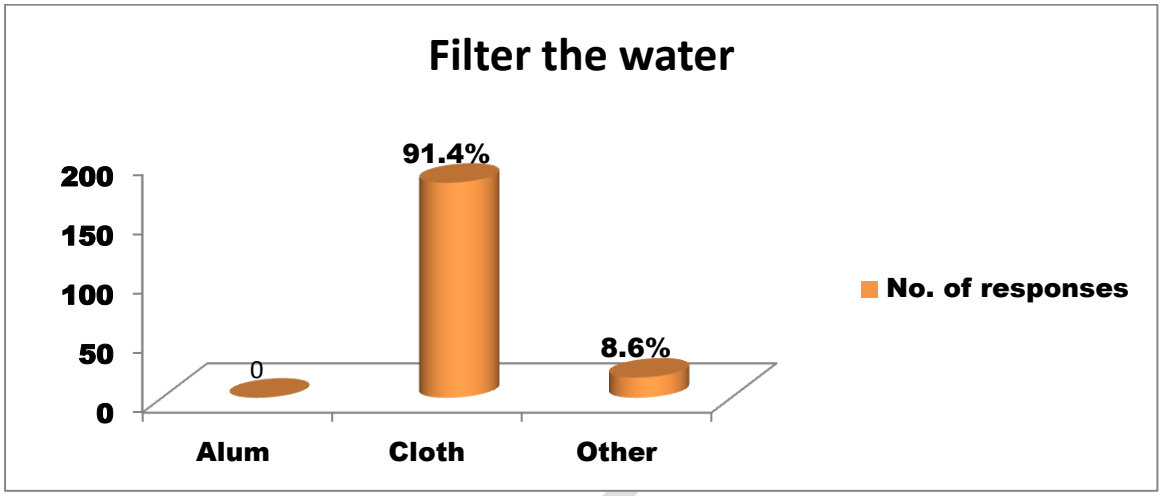


Figure 8 shows that 91.4% respondents filter water by cloth and 8.6% respondents filter water through using sieve.

Figure 9.

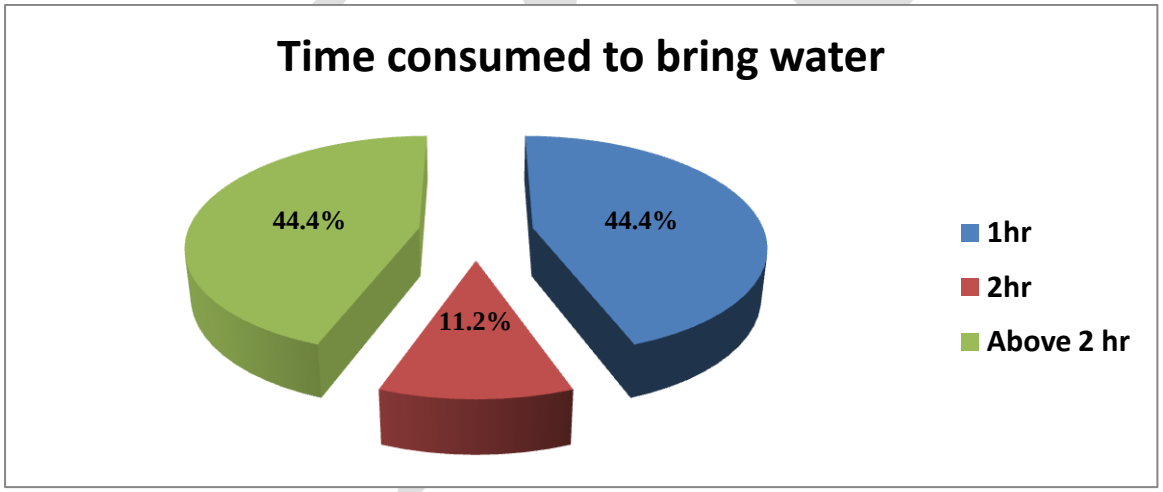
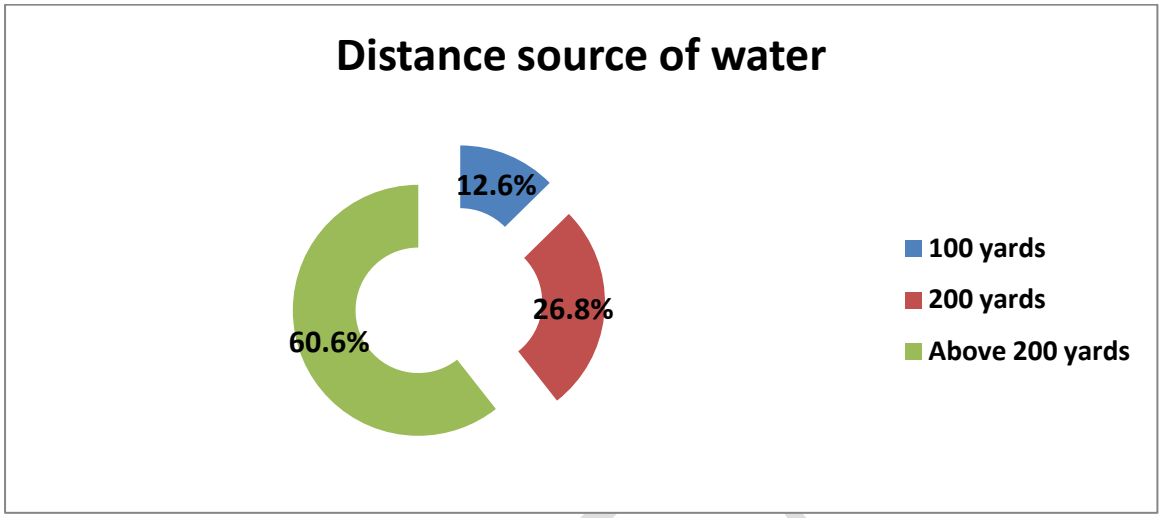


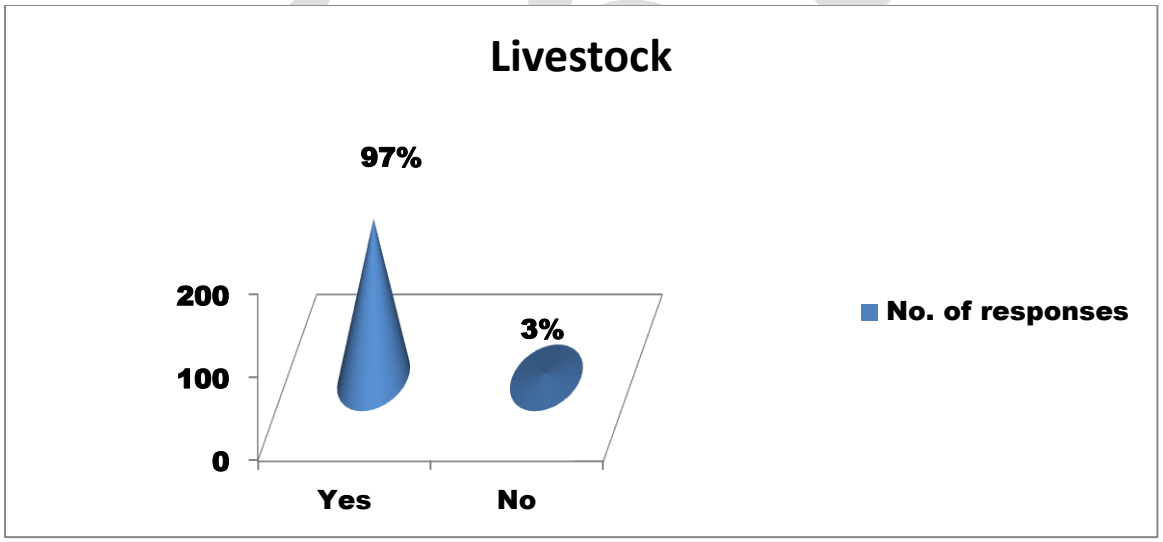
Fig 9. Interprets that earlier 44.4% -44.4% respondents use to take 1 hr and above 2 hr to bring water. And remaining 11.2% respondents take 2 hrs to bring water from near by sources.

Figure 10.



From fig 10. We can analyse 60.6% respondents source of water was above 200 yards, 26.8% respondents was 200 yards and 12.6% was within 100 yards.

Figure 11.



From fig11. We can analyse that 97% respondents have livestock in their household and remaining 3% does not have any livestock.

Figure 12.

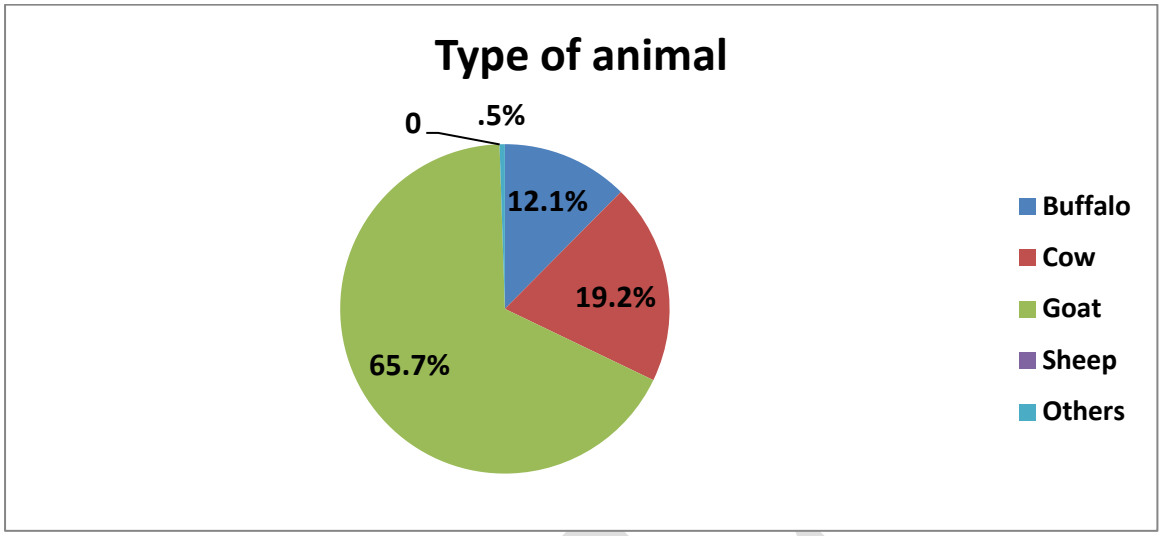


Fig 12. Interprets that 65.7% respondents have goat in livestock, 19.2% have cow, 12.1% have buffalo and .5% have other animal.

Figure 13.

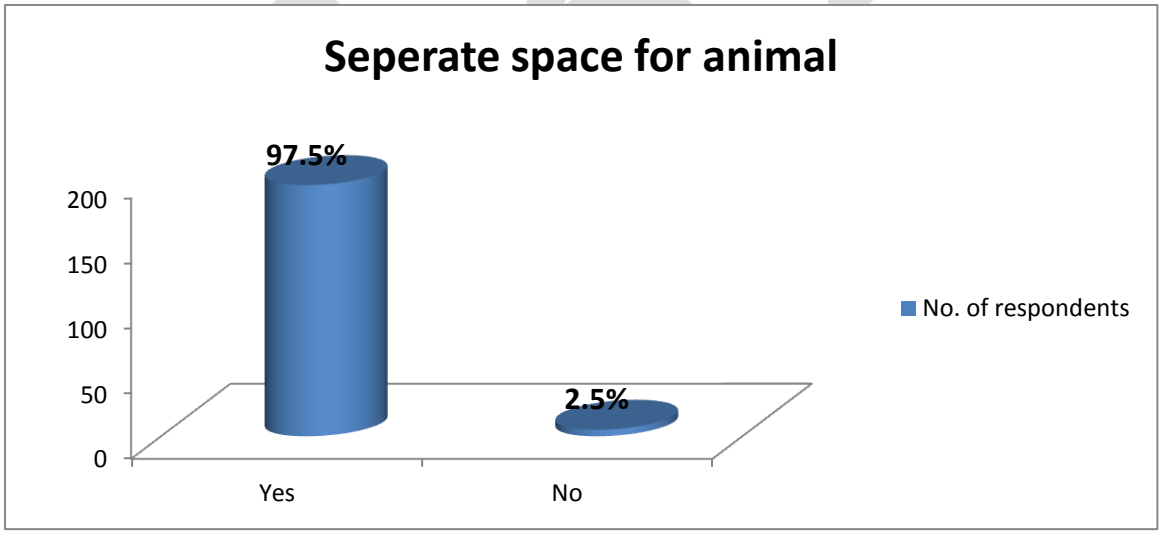
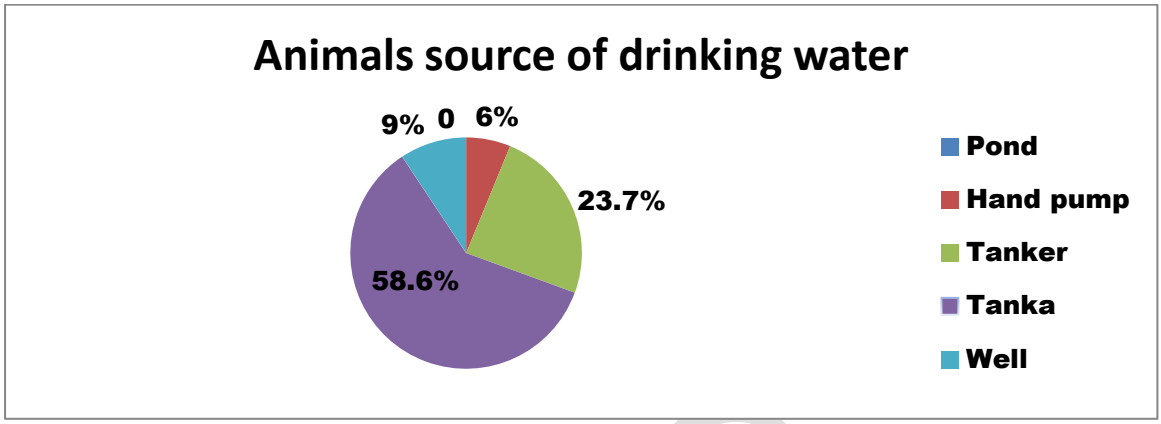


Fig 13. Interprets that 97.5% respondents have separate space for animals while 2.5% does not have animals.

Figure 14.



Interpretation of fig 14 . 58.6% respondents give their animals tanka water for drinking, 23.7% respondents use tanker water, 9% use well water and 6% use hand pump water**.3**

4.3 Brief Summary Of Villages:

Jailsan

Gram panchayat – Inderpura

Sarpanch – Mrs Bhugani devi

Overall 26 tankas are constructed in this village, out of which 14 tankas were surveyed to assess the impact of this project on beneficiaries.

These beneficiaries told that earlier they had huge problem regarding drinking water as well and tubewells contain saline water which can be used only for other household work. After contruction of tankas they are benefitted as these tankas are connected to roof top and during rain terrace water first goes to filter chamber which is fitted with pipe coming from roof which is located near tankas. These filter chamber contains 3 layers of rock through which water gets filtered before getting stored in tankas. They fetch water through hand pumps fitted on tankas. These tankas storage capacity is 1500 litre which can be used for 4-5 months it depends according to family size. When water is finished in tankas they get these tankas filled with tankers which they call from daulatpura at the rate of 500- 700 rs.

Here people face one problem that there terrace is small so less water is stored in tankas at the time of rain.

Toilets are unavailable only few households have constructed toilets of their own.

Mr. Puran ram husband of sarpanch and Mr. Bhanwar singh helped me during interviewing beneficiaries.

Tanwra

Gram panchayat – Tanwra

Sarpanch – Mr. Goverdhan ram jangid

Population of this village is approximately 3500. Overall 52 tankas are been built here out of which 33 tankas were checked, Out of 52 tankas 5 beneficiaries are given full financial assistance to construct tankas as these households were very poor and women were widow with small children. This financial assistance was given with the full consent of other villagers.

Dug well water is used for bathing, cleaning, washing.

Approx: 50% villagers are benefitted from PHED water supply from Ground level reservoir (GLR). Water comes from Nechwa.

Here also very few toilets had been constructed.

Mr. Pukhraj soni and other villagers helped me during survey.

Bithooda

Gram panchayat – Saawraad

Sarpanch – Mrs. Om kanwar

Population of this village is 5000. Here total number of tankas is 18 out of which 10 tankas were checked.

Pipeline is linked from Bakalia but water is not being supplied to village. Here tankers are being called from Nimijodha.

Very few toilets are constructed.

Mr. Ishwar singh helped me during survey.

Dhyawa

Gram panchayat – Dhyawa

Sarpanch – Rameshwarlal prajapat

Population of this village is approximately 4000. In this village maximum no. of tankas had been constructed. 95 tankas out of which 42 tankas were checked. In this village maximum majority is of Meghwal caste. People are unaware of hygiene as they have toilets but they are not clean.

Here water comes from Pirwasi, People call tankers.

Mr. Hanuman Prasad Sharma ex-sarpanch helped me during interview.

Loadsar

Gram panchayat – Tanwra Sarpanch –

Mr. Goverdhan ram jangid

Total population of this village is 2000. Overall tankas are 30 out of which 17 tankas were checked.

Singhana

Gram panchayat – Singhana

Sarpanch – Mrs. Birmadevi Jat

Total population of this village is 2000. Overall 50 tankas are constructed in this village out of which 25 tankas were surveyed. Pipeline is linked from saawraad but water is not being supplied. Tanker comes from about 12 km away from Baldu which cost 550 rs / tanker.

Mr. Thaansingh helped me.

Supka

Gram panchayat – Supka

Sarpanch – Hanumanaram meghwal

Total population of this village is approx: 4000.Total no. of tankas are 20 out of which 11 tankas were checked.

Existing water comes from Maulasar chugni by PHED due to unavailable drinking water in village. They supply water at the interval of 15 days. Approx: 15 tanks are constructed in village.

n

n

No construction of toilets in this village.

Mr. Haumanaram meghwal (sarpanch) and Mr. Bashir khan helped me at the time of survey.

Thanu

Gram panchayat -

Sarpanch – Mr. Shyam singh

Total no. of tankas is 19 out of which 10 tankas were checked.

Water supply is from Daulatpura which is supplied at the interval of 3 – 10 days. So people have to call tankers.

Local people helped me here because Sarpanch is least concerned about the project.

Chak khardiya

Gram panchayat – Singhana

Sarpanch – Mrs. Birma Devi Jat

Overall population of this village is 1000.

Total no. of tankas in this village is 25 out of which 13 were checked. Here also tanker comes from Baldu at the rate of 600rs.

Mr. Mohan lal Sharma helped me during interviewing beneficiaries.

Madam

Gram panchayat – Kalwani

Sarpanch – Hemaram manda

Total population of this village is 1000.

This village was the model village for the project , along with the construction of 45 tankas here 85 toilets were also constructed. 23 tankas were checked. 10 tankas were fully financial supported.

As this village is the model village situation have changed a lot. People are happy and satisfied after intervention of IBF.

This village is very poor village as no one is having govt. Job. Beneficiaries have been provided by plastic sieve to filter water. Dandiwala lota is also been given to them. Even toilet brush is been given to them to clean their toilets.

Previously in this village pipeline was coming from Baklia but water was not being supplied. People call tankers from Nimijodha and Baklia at the rate of 700rs. At present in village there is 1 well and 1 tube well.

Here Late. Mr. Jaisingh Rathore helped me during meeting beneficiaries.

4.4 Case Study

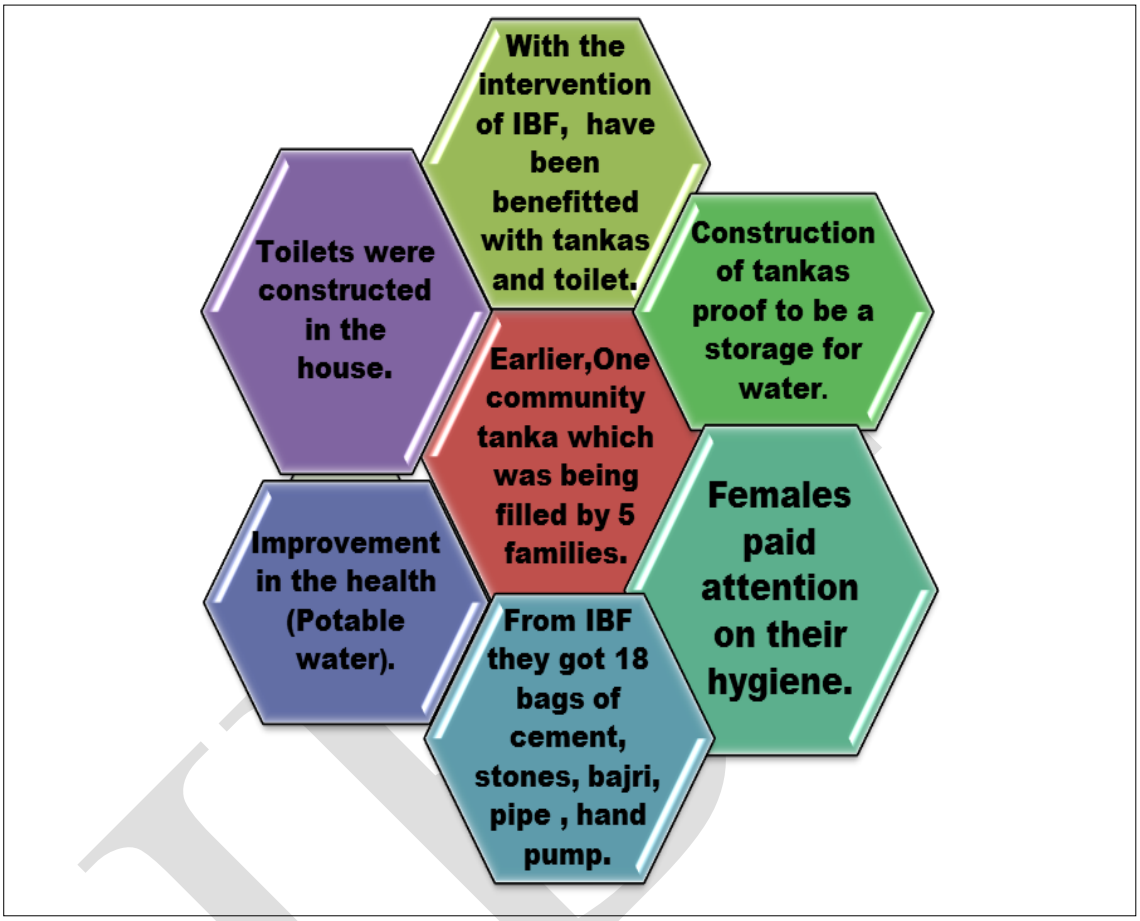
Dalip singhji (33yrs) and his wife Shantiji (30) they live in Madam Village of Didwana block. They got married 15 years back. They have two children. 11 year son Sahil and 4 year daughter Prakash. Sahil is in 5th standard and Prakash

is in 1st standard. Sahil goes into private school at Bithooda and Prakash goes to Govt. School in Madam. Dalip Singh and Shanti's day begins from 5am in the morning. Finish with their daily activities. Shanti milk her goat and then prepare tea. Then prepare food. Meanwhile she readies her children for school. Then she cleans her house. They go for work at NREGA. They return from work after 5pm. And again they get indulge into their household activities.

With the intervention of IBF, they have been benefitted with tankas and toilet. Their cost incurred in construction of tankas was approximately 15000rs. From IBF they got 18 bags of cement, stones, bajri, pipe, hand pump. Recently they got this tanka filled with tanker. Previously they had to face many difficulties for bringing drinking water from other village. In other village there was one community tanka which was being filled by 5 families together through tankers. They have founded many changes after the construction of tankas and toilets. As water stored through rain they don't have to go to other village for water. Once filled through rain water that water could be used for 5-6 months. There is improvement in their health also. As due to the availability of potable drinking water they are getting sweet water and now they are not bound to drink saline water. By drinking saline water their health use to get affected. Very frequently they use to suffer from diarrhoea, fever, malaria. For many days they did not bath. As toilets were constructed in their house they don't have to go outside for

defecation and women felt safe and secured. Females paid attention on their hygiene. Now they keep their house and utensils also clean.

Findings of Case Study:



Chapter 6
Recommendation and Limitations

The recommendations were as follows:

1. An attempt was made to know the socio-economic and health status of beneficiaries in the project area.

2. This study mainly deals with the quantity and quality of water available to people, cleanliness and maintaining health and hygiene.

3. Rooftop rainwater harvesting is the technique which is observed essential for the people in this area as they collect water from far off sources.

4. These tankas are helping people with the problem of water scarcity.

5. As filter chamber is connected to these tankas and pipe coming from roof so that it stop the solid material to enter the tankas.

6. Once the rain water is stored in these tankas it solves the problem of water scarcity for 5-6 months.

7. The quality of water is also shown an improvement in the area after implementation of the project (as per the perception of the beneficiaries).

As villager are so much benefitted from these tankas that other villagers are also demanding for such type of project being run in their villages also.

Limitations of the study:

1. Limited and uncertain local rainfall

2. Can be costly to install – rainwater storage and delivery systems

3. Certain roof types may seep chemicals, pesticides, and other pollutants into the water that can be harmful.

4. If not installed correctly, may attract mosquitoes

5. Organisation after construction may stay present to supply the users spare parts and repair material.

6. Once tanka gets full, future benefits of rain cannot be taken.

7. Size of the roof-top is too small.

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ANNEXURE :

Annexure 1: Questionnaire:

Village Questionnaire								
	To assess the impact of Rain Water Harvesting (RWH) project in the project area.							
A	**DEMOGRAPHIC:**							
1	Name of Gram panchayat:							
2	Name of village:							
3	Name of sarpanch:			Contact Number				
4	Total number of household:							
5	Total Population:							
B	**SOCIAL:**							
1	Name of family head:							**Answer**
2	Contact no. (if any)							
5	Age:							
6	SEX:	(A) Male	(B) Female					[ ]
7	Category:	(A) APL	(B) BPL					[ ]
8	Caste:	(A) SC	(B) ST	(C) OBC	(D) GEN			[ ]
9	Education:	(A) Literate	(B) Illiterate	(C) 1-5	(D) 5-10	(E) Above 10		[ ]
10	Occupation:	(A) Agriculture	(B) Skilled labour	(C) Unskilled labour	(D) Govt.service	(E Private service	(F) Unemployed	[ ]
11	Type of family:	(A) Nuclear	(B) Semi nuclear	(C) Joint family				[ ]
12	No. of family members:	(A) 2	(B) 4	(C) 6	(D) 8	(E) Above 8		[ ]
13	No. of male members:	(A) 1	(B) 2	(C) 3	(D) 4	(E) 5	(F) 6	[ ]
14	No.of female members:	(A) 1	(B) 2	(C) 3	(D) 4	(E) 5	(F) 6	[ ]
15	No. of girl child:	(A) 1	(B) 2	(C) 3	(D) 4	(E) Above 4	(F) None	[ ]
16	No. of boy child:	(A) 1	(B) 2	(C) 3	(D) 4	(E) Above 4	(F) None	[ ]
C	**ECONOMIC:**							
1	Status of family:	(A) Low	(B) Medium	(C) High				[ ]
2	Total income of family:							[ ]
D	**STRUCTURE (Tankas)**							
1	What is the capacity of structu	(A) 15000 litre	(B) 20000 litre	(C) 25000	(D) Above			[ ]
2	How much cost is incurred:	(A) No cost	(B) less than 5000	(C) 5000 to 10000	(D) 10000 to 1500	(E) Above		[ ]
3	Is the handpump in working co	(A) YES	(B) NO					[ ]
4	Are the well connected to roo	(A) YES	(B) NO					[ ]
5	Are they using filter chambers	(A) YES	(B) NO					[ ]
6	Are they aware about the hygi	(A) YES	(B) NO					[ ]
7	Is the roof properly cleaned or	(A) YES	(B) NO					[ ]
8	Are they aware of the benefits	(A) YES	(B) NO					[ ]
E	**SANITATION:**							
	No. of toilets in village:							[ ]
1	1. Is there construction of toile	(A) YES	(B) NO					[ ]
2	2. Are these toilets clean:	(A) YES	(B) NO					[ ]
3	3. Do they use toilets:	(A) YES	(B) NO					[ ]
F	**HEALTH RELATED ISSUES:**							
1	1. Do you clean your utensils d	(A) YES	(B) NO					
2	2.DO you use dandiwala lota .	(A) YES	(B) NO					[ ]
3	3. Is the area nearby tankas is	(A) YES	(B) NO					[ ]
4	4.Do they fetch water from buckets or use handpumps:	(A) YES	(B) NO					[ ]
5	5. Did you find any changes in health after constuction of	(A) YES	(B) NO					[ ]
6	6.What diseases were common before construction	(A) Fever	(B) Diarrohea	(C) Malaria				[ ]
7	7. Which water they use for dr	(A) Handpump	(B) Tanker	(C) Pond	(D)Tanka			[ ]
8	8. How do they filter the wate	(A) Alum	(B) Cloth	(C) Other				[ ]
9	9. Earlier how much time they consumed to bring	(A) 1 hr	(B) 2hr	(C) Above 2 hr				[ ]
10	10. How far was the source of	(A) 100 yards	(B) 200 yrds	(C) Above 200 yrds				[ ]
11	11. DO you have livestock:	(A) YES	(B) NO					[ ]
12	12. What type of animal do yo	(A) Buffalo	(B) Cow	(C) Goat	(D) Sheep	(E) Others		[ ]
13	13. If yes then do you have sep	(A) YES	(B) NO					[ ]
14	14. What is the source of their	(A) Pond	(B) Handpump	(C) Tanker	(D) Tanka	(E) Well		[ ]

ANNEXURE 2: PHOTOGRAPHS

Figure No.1: Pipe line at Thanu village from where drinkinking water is collected, and each day it consumes 1-2 hours.

Figure No.2: Information being gathered in Bithooda village.

Figure No.3: Beneficiaries household at loadsar village.

Figure N0.4: Tanka in Bithooda village.