A Project Proposal

Building Access to Safe and Reliable Drinking Water for Marginalised families of Thar Desert region

An Intervention Proposed for rural areas of Barmer District, Rajasthan

Proposed by

RAF Global

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ABOUT RAF GLOBAL

RAF Global is a private, non-denominational, not-for-profit international organisation committed to improving the quality of life primarily in selected countries across Africa and Asia. RAF Global has branches and affiliates in 6 countries. RAF Global works with the most marginalized individuals, families, communities in the poorest areas of Asia and Africa to improve the Quality of Life by acting as a catalyst that brings together resources, technology, systems, and effective grassroots strategies, giving better choices and control to people for lasting change. In pursuit of its mission, RAF Global endeavors to make long-term, strategic and systemic investment around the key sectors of health, nutrition, education, and sustainable livelihoods (economic development), along with advancing good governance at the sub-national level. For more information about RAF Global, please refer to our website www.rafglobal.org

Operational since 2015, RAF Global is registered in India under section 8 of the Indian Companies Act, 2013. With long term interventions in the Indian states of Gujarat, Maharashtra, Rajasthan and Jharkhand, it is reaching out to over 600,000 lives through multi-sectoral programmes. RAF Global presently implements a wide array of long-term and comprehensive projects in seven districts of the intervention states, across the sectors of livelihood, public health, nutrition, water and sanitation, education along with expanding the scale and scope of good governance.

RAF Global started working in Barmer and Jaisalmer districts of Western Rajasthan during the second wave of Covid-19 pandemic, in response to the humanitarian crisis and to support the health systems in selected districts (Civil hospital at the district level as well as, block level Community Health Centres). RAF Global committed financial and human resources to support the district administration towards meeting emergency requirements for Oxygen cylinders, Concentrators, Oximeters, Oxygen regulators, humidifiers, NRBM masks etc. Based on the district administration's request for support of a Covid care centre in Jaisalmer, RAF Global had also set up a 100 bed make-shift COVID care center.

Once the surge in Covid-19 infection receded, RAF Global moved towards development focused intervention in Barmer district, starting with addressing the water scarcity in rural areas. Ground water in the district is saline and existing pipelines do not entirely fulfill the demand for water. As a result, rainwater harvesting is amongst the best possible solution to address the water woes in the district.

The region also had a rich heritage of building rainwater harvesting structures since time immemorial. RAF Global therefore decided to revive the practice of conservation and harnessing of rainwater for better health and nutrition outcomes. The district had earlier benefitted from construction of underground water tanks, locally called *'tankas'* under various Government schemes spread over a decade and more. However, in the 2 blocks that RAF Global studied, most of these structures were found to be non functional mostly because the catchment area of the *tankas* were damaged and could no longer conserve the rainwater. The size of catchments were also small that barely conserved 3 to 4 feet rainwater. With meagre and erratic source of income, the inhabitants could not afford

reconstruction of the catchments of their *tankas*. As a result, they had to buy water that sustained the families for 6 to 8 months. This is a huge expense for communities that are living in extremely tough conditions and have no savings from income earned as agricultural labour or migrant workers in stone quarries.

Through an intensive process followed in 2 blocks, Sindhari and Payla Kalan that involved community consultation, need identification, mapping of existing assets, engaging with the Block Development Officers, design testing, commissioning of reconstruction work and regular monitoring, RAF Global rehabilitated rainwater harvesting tanks of over 150 households that are already reaping benefits in terms of improved access to safe water for drinking and domestic use,several months after the monsoon seasons. The intervention is projected to translate into an annual savings of Rs 10,000 to 12,000 for each of the beneficiary families. RAF Global believes that the savings will contribute towards food security and improving health outcomes of beneficiary families.

RAF Global has witnessed the benefits of the intervention and proposes to developmental agencies that scaling up such a low-cost initiative is required in the region. A renewed focus on existing rainwater harvesting tanks (built at the household level) in Barmer district will not only offer succor to the rural inhabitants, strengthen other water and sanitation schemes in the area but also revive dead assets and drive a new initiative of conservation and innovating on past investments for the cause of Serving Humanity and Nation Building.

AN INTRODUCTION TO BARMER DISTRICT

A large part of the Barmer district comprises intricate flat plains with variable thickness of sand sheeting, sandy hummocks and high dunes with no drainage system. The Eastern and northeastern parts are relatively free from dunes, but its southern and western parts are intensively covered with high dunes. Scattered hills occur in the Siwana, Nakoda and Barmer regions. Luni river is the sole lifelinewhich enters the district at its eastern boundary and culminates in the Rann of Kutch. Other rivers and small stream are lost in the sandy terrain, after flowing some distance. A landscape dominated by dunes offers meagre scope for rainwater conservation, with little runoff potential. However, the presence of sporadic hills and rocky exposures offer good sites for rainwater harvesting.

The mean annual rainfall in the district varies from 20.97 cm at Sheo to 34.58 cm at Siwana. The coefficient of variation varies from 55.2 (Sheo) to 77.0 (Chohan), and the standard deviation (mm) varies from 115.8 (Sheo) to 197.6 (Siwana). In general, we could characterize the rainfall conditions in the district area as low, erratic and unpredictable. The frequency of drought years (less than 50 per cent of average annual rainfall) varies from 14 percent at Siwana to 24 per cent at Balotra. Moreover, nearly in 1,62,002 km (57 per cent) area, the groundwater contains 1500 to 3200 ppm TDS and deep-seated water. Drought is a recurrent phenomenon, with the district of Barmer facing it once in every 3-4 years cycle. Hence, due to low and erratic rainfall and poor quality of groundwater coupled with terrain characteristics, paucity of drinking water for human and livestock populations is acutely experienced apart from lack of water for irrigation. Therefore, surface and groundwater development assume prime significance in the district area.

In a situation like in the Barmer district, the key challenge is how to save water that is available during excess rainfall year and conserve it for deficit years. Moreover, late onset of monsoon, early withdrawal of monsoon and prolonged dry spells between two rain showers pose additional problems.

Mitigating the drinking water problem in remote areas like the *dhanis* where there is no water source in the nearby vicinity is a challenge, and this challenge will possibly make it difficult for the Jal Jeevan Mission to ensure water supplies through pipelines. This proposal therefore brings attention toward making use of existing (and invested) resources of the many *Tankas* (Rainwater Harvesting Tanks) that have remained the mainstay in solving drinking water problem in the region for centuries. It needs to be mentioned here that large number of these structures that are critical community assets, are not functional and deserve immediate repairs to be able to serve the communities, again.

THE BACKGROUND

Rajasthan ranks extremely low on the Jal Jeevan Mission Dashboard as of July 15, 2022. With regard to the ***'Har Ghar Nal Yojna'***, of the 1,05,68,805 households in Rajasthan, only about 26 percent of households benefit from tap water inside their dwelling units. The dashboard shows about 27,23,680 families having access to tap water connection.

Barmer district particularly, has much lower percentage coverage in '***Har Ghar Nal Yojna'***. Of the 4,46,815 households, only 55,658 families, i.e. 12.46 percent, have such an access. The July 15, 2022 data from **Jal Jeevan Mission** mentions a total coverage of 41 villages in Barmer district only. The spread of the work under the Jal Jeevan Mission in the district of Barmer is shown in the table below.

TABLE 1: WORK IN BARMER UNDER JAL JEEVAN MISSION

Block	Panchayat	Village	HH	HH having Tap
Baitu	3	9	1272	1272
Balotra	1	1	4	4
Gida	2	4	430	430
Patodi	11	21	3696	3696
Samdhari	4	4	4315	4315
Shiv	1	1	186	186
Shindary	1	1	228	228
Total	**23**	**41**	**10131**	**10131**

With the population living in desolate locations in rural locations in Barmer, a centralized water system, also known as the PWS (Public Water Scheme), may not always be workable. Many households with fewer numbers stay in small hamlets spread across the village boundary. Usually, these hamlets may belong to a single descendent, and some or the other blood relations relate the families to one another. The village population is scattered all across, and a centralized pipeline system is technically and financially unviable to implement.What adds to the problem is the water quality. With high TDS and salinity in the water, even a piped water system will not possibly serve the need for drinking water.

The Government of Rajasthan has been investing its resources in developing infrastructures to benefit the inhabitants in rural locations through access to quality water for household consumption. Since the ushering of the MNREGS, the Government has used the funds allocated under the 60:40 ratios for constructing Rain Water Harvesting Tanks. Typically, these tanks are cylindrical and are about 12 feet in depth and diameter. These tanks use local materials (stone and sand) to construct the walls. Cement is also used for construction, and local labour from the family gets employed under the MNREGS as labourers and paid as per the Government rate for unskilled labourers. The Rain Water

structures hold about 35,000 litres of water which is sufficient for a family of five to draw out about 100 litres per day and use the same for household chores and drinking.

While significant rainwater conservation structures have been created with high potential to address the water crisis in Rajasthan, quality of construction has been an issue with most of these tanks. For example, incorrect plastering of the inner walls of these tanks have resulted in seepage of water collected in these tanks. Secondly, the catchment areas around the tanks were mostly earthen and with a small circumference that did not allow significant runoffs to flow into the tank. Also, being earthen (*kutcha*), the runoffs carried with it soil and sand that led to siltation as well as poor water collection quality in the tanks. The gathered silt further reduced the capacity of these tanks.

Over a period, these tanks have stopped meeting water requirements of the households, thus leading to neglect and non usage of tanks for the purpose these were built. Families have resorted to buying water from tankers or engaging family members to obtain water from faraway water tanks and other sources. Women have largely borne this burden of fetching water from sources as it is perceived to be their responsibility to fetch water for household consumption and use.

Consequently, benefits of the Central Government programme, 'Swachch Bharat Mission' which constructed toilets for the households has had a low uptake. Carrying the scarce commodity (water) from long distances on bare feet, and using them for sanitation purposes was found unreasonable and unconvincing by the local communities. Advantage of the scheme hasthus remained out of bounds for the inhabitants.

After interacting with the villagers, RAF Global saw the scope to rehabilitate existing rainwater harvesting tanks called *Tankas* by constructing a *'pucca'* (masonry) catchment around the circumference of the water tanks. The masonry structure helps collect rainwater as the runoffs would get accumulated into the tank. The runoffs will not have sand or other particles and will enable clean water collection.

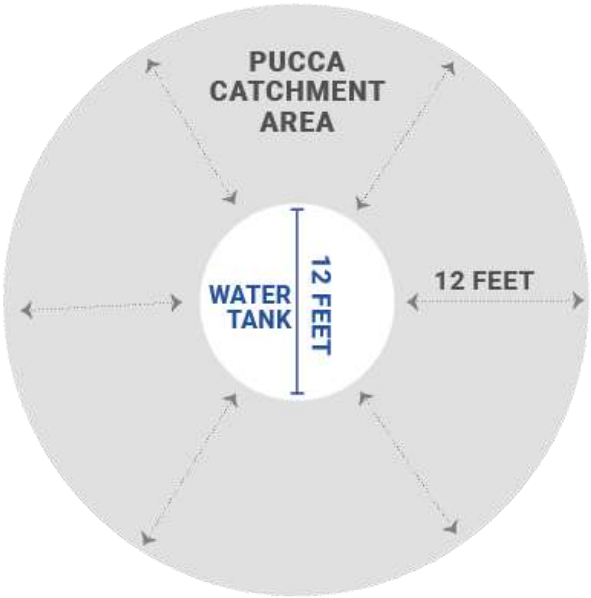
RAF Global has helped construct over 150 such structures with households that could not afford to invest the amount of Rs 25,000 required for its rehabilitation. These investments have helped beneficiary families revive use of their tanks and use the stored rainwater from these tanks. Most of these tanks were not in use for several years. The rains during the previous monsoon (2021) and present monsoon (2022), have helped to recharge these tanks to their brim. The households have saved their hard-earned income from obtaining water through the payment of tankers and now do not have to tread long distances daily to fetch water. Women and young girls are the ones whose burden has now been reduced. Many families have been using toilets as sufficient water is available to meet such needs.

TECHNICAL SPECIFICATIONSOF EXISTING INFRASTRUCTURE

The MNREGS tank, size 12 feet in diameter and 12 feet in depth, has a storage capacity of about 35,000 litres. These tanks didn't benefit from the catchment area that was designed to make runoff water accumulate into the underground tank. RAF Global added some elements for greater efficiency. It has built a masonry catchment area of about 12 feet in width with an inclined plane towards the tank. The total catchment area of the tank together with the cemented masonry section increased to a dedicated catchment of about 92.38 sq meters. Given the calculation of water collection of 1 litre per 1 sq meter, the area of 92.38 sq meters will thus yield about 90 litres per mm of rainfall. Therefore, about 390 mm of precipitation will be sufficient to enable 35,000 litres of water get collected in the tanks. A family with this collection can fetch about 100 litres of water daily from the tanks, enough to suffice the yearlong need for all household consumption.

Size of Tank	12 feet diameter X 12 Feet height	35000 liters
Catchment area	12 feet width from the central tank from all the side =92.38 sq meters	
Rainfall required	390 mm	

A newly built infrastructure today costs around Rs 3,00,000. The structures that were constructed before the year 2015-16 cost approximately Rs 60,000 to Rs 1,50,000. With minor repairs, cleaning (de-silting) of the tanks and efforts towards improving the catchment area around these tanks, the real potential of these water tanks will be unlocked and families will reap the benefits from rain water harvesting for a long time to come. Presently, these structures are in a state of neglect and unusable.

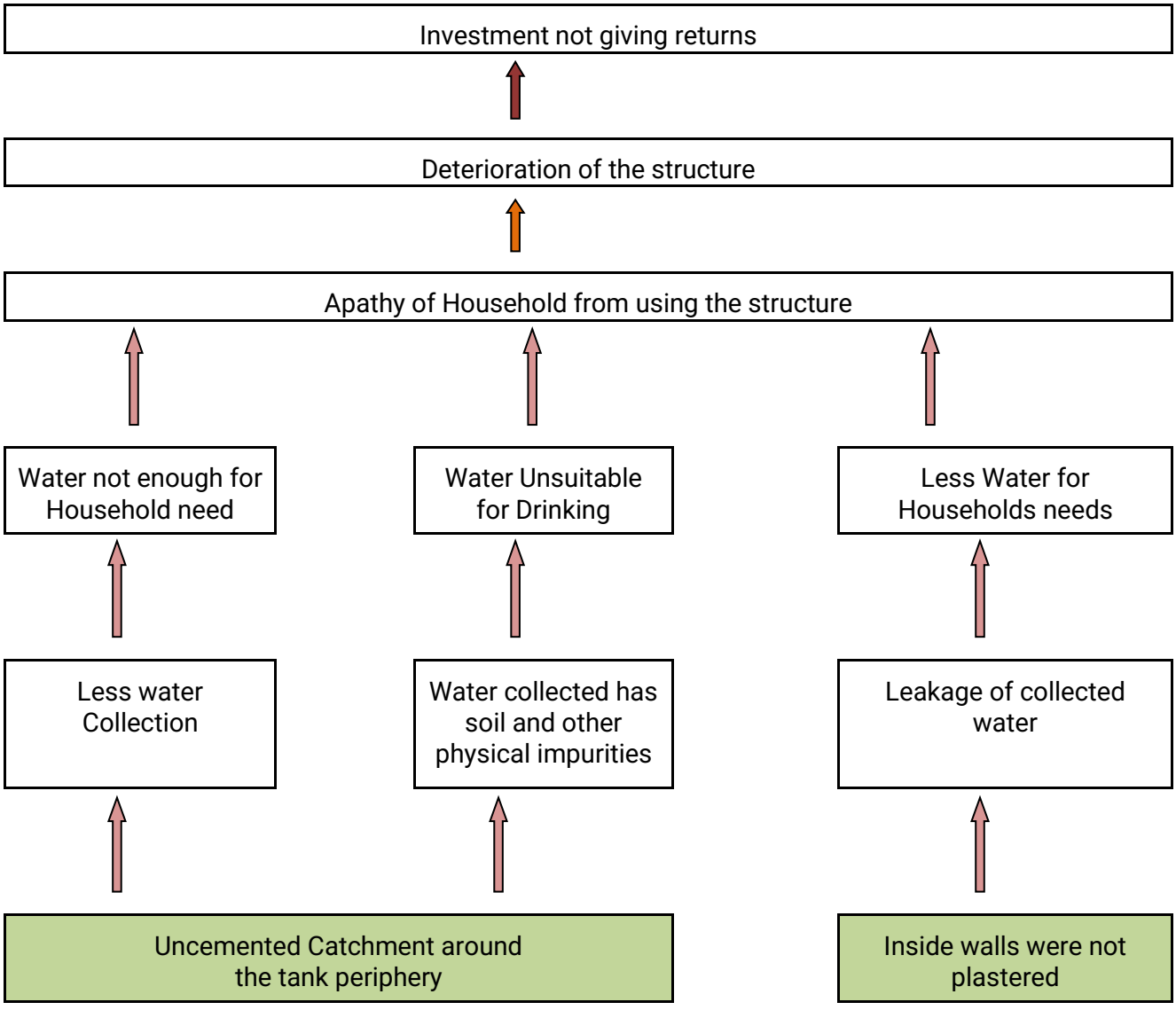


Outer circle represents the proposed pucca catchment area forharvesting rainwater. The inner circle with 12 ft diameter and 12 ft height represents the centralwater tank/tanka where runoff water will get accumulated through an inlet into the tank.

PROBLEM ANALYSIS

Under the MNREGS programme, many households received grant support to construct rainwater harvesting structures. The amount per tank in the initial days was less, which did not have the cemented catchment around the periphery of the tank. This resulted in much reduced water collection. With less water collection, the households paid little attention to these structures as they did not meet their requirements. Over the years, the nonuse of meagre tank collection apart from siltation caused by soil and sand deposits has deteriorated the quality of these tanks. Further, the quality of construction was not what would allow these tanks to continue to serve the households. The percolation of the stored water through cracks and crevices also reduced the overall storage.

PROBLEM TREE



The intervention suggested has been experimented with, by RAF Global in Rajasthan, India. Around 150 households in the Barmer district had their old, dilapidated tanks repaired and are today water secure. Efforts by RAF Globalhave included work on two broad aspects. These are,

1. Increasing the catchment around the tank periphery and making it a cemented structure.
2. Plastering the inside walls of the water tank to help the water remain within the tank and avoid seepage.

Besides, RAF Global also undertook fencing to protect the tank from anyone venturing inside and damaging the cemented catchment. The fencing also keeps the cemented catchment clean and reduces impurities from the physical environment from depositing into the tank along with runoff water. The intervention activities are simple, and the experience suggests that with the rainfall that happens in the area, these tanks will certainly get filled every year.

Data from the MET department for the last 11 years (2011 till 2021) have shown that in a cycle of 11 years, there are three years when the tanks will get filled up, four years when the tanks will get about 75% capacity filled up and three years will have about 50% capacity filled up. So only once in 11 years, the tanks will have 40% capacity filled up.

TABLE 2: DATA ON RAINFALL IN BARMER

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Rainy days	Single day	Most rainy day
2011	0	13	0	0	3	0	38	187	102	0	0	0	343	19	77	31-Aug
2012	0	0	0	0	0	0	15	78	165	0	0	0	258	13	43	08-Sep
2013	3	23	1.5	15	0	31	112	122	98	49	0	0	454.5	17	76	26-Jul
2014	0	0	0	0	62	10	104	43	71	0	0	0	290	11	71	04-Sep
2015	10	1	4	7	28	52	187	7	24	0	0	0	320	21	55	26-Jul
2016	0	0	0	0	1	5	32	232	0	21	0	0	291	16	35	26-Aug
2017	3	0	0	0	0	112	343	20	13	0	0	3	494	21	44	01-Jul
2018	0	0	0	0	0	90	3	58	2	0	0	0	153	6	45	29-Jun
2019	7	0	0	5	47	43	31	101	96	42	112	2	486	29	76	11-Nov
2020	10	0	9	0	16	48	57	183	23	0	0	0	346	23	63	31-Aug
2021	0	0	0	0	3	49	44	11	98	0	0	0	205	15	36	19-Jun

TABLE 3: CAPACITY FILLED UP PER YEAR

Year	Total	Capacity
2011	343	88
2012	258	66
2013	454.5	117
2014	290	74
2015	320	82
2016	291	75
2017	494	127
2018	153	39
2019	486	125
2020	346	89
2021	205	53

SUGGESTED INTERVENTION

RAF Global has witnessed the immediate benefit of the intervention to rural households with a one-time investment of **Rs 33,000 per household** as well as, believes in the future benefits for years to come. This intervention will revive the investments made through schemes that the Government had made earlier, in constructing underground rainwater tanks and that are presently, dead investments as these have been abandoned and not serving any purpose.

When ownership of a critical asset is defined (in this case, the household member, preferably women) and benefits are demonstrated such as significant collection of good quality rainwater, in all likelihood, the beneficiary households also take charge of maintenance of the asset as well as, support other households in the *dhaani* with access to clean drinking water. For the beneficiary household, the investment offers security of drinking water supplies throughout the year. A dead asset is brought back to life and the Government's investment is prevented from wastage. The benefiting communities are often so poor that they have not been able to put their meagre income into repair of the tank catchment areas or the wall. The small investment proposed by RAF Global will bring back the household's interest into the traditional practices of rainwater harvesting and reduce the dependency of water tankers from market, resulting in annual savings of about Rs 10,000-12,000 in a year. Women will save time and the distress experienced in obtaining water from faraway locations.

RAF Global aims to rehabilitate 330 water tanks belonging to the most marginalized section of the society spread over 3 years. Breakup of the investment per unit to rehabilitate a rain water harvesting tank for an individual household is provided in the table below.

TABLE 4: COST PER UNIT FOR REHABILITATION OF EXISTING TANKS

S. No.	Material	Quantity	Unit Price	Total Cost
1	Cement bags	10	500	5000
2	Stone Slabs 6 ft	10	300	3000
3	Steel Net (100 ft)	1	3500	3500
4	Plain wire	6	100	600
5	Hand Pump fittings	1	2000	2000
6	Door (4 ft x 3 ft)	1	700	700
7	Bajri (Gravel) (1.5 trip)	1.5	2600	3900
8	Kankari 40 mm (1 trip)	1	3000	2000
9	Water Tanker (1 tank)	1	1000	1000
10	Pipe (10 ft)	1	80	800
11	Transportation Cost	1	1500	1500
12	Skilled Mason (3 days)	3	1000	3000
13	Labour cost (5 days)	5	600	3000
14	**Contingency**			**3000**
	Total Cost per Catchment			**33,000**

Of this investment, the households will bear the cost towards the labour component, which is about 5 labour days per unit, and the amount earmarked is **Rs 3000 per unit**. It may come as a household contribution to repairing and rehabilitating their water tank. However, this amount will be waived off for some households that do not have labour (e.g. elderly households).Further the contribution is subjected to the economic status of the household.

Investing in a Hand Pump with the fittings will prevent the daily opening of the tank covers. It is to avoid the stored water from any external exposures. Using the bucket and ropes, which are likely to contaminate the water, will thus be done away. In addition, the water users (here the tank owners) and women members of the households will be provided with training in managing the water and the tank.

PROPOSED ACTIVITIES (PART OF DESIGN FOR REHABILITATION OF TANKS)

The following activities and strategies will help execute the work of rehabilitating the proposed 330 water tanks spread over 3 years.

Formation of Village level Committee: In each of the identified villages, a committee comprising Panchayat representatives, community leaders and youth volunteers with equal participation of women will be constituted before the execution work gets started. The committee will support the identification of beneficiaries based on the criteria defined so that they can identify the neediest families.

Community Consultation: With the support of the village-level groups, a consultation will be done with the community and Panchayat to select the contractors and monitor the process to keep transparency.

Meeting with the concerned Block Development Officers: Wherever RAF Global has undertaken the intervention, a standard protocol has been holding a meeting with Block Development Officers of each of the intervention blocks to share the list of beneficiaries and inform them about the work that RAF Global will undertake to reconstruct the catchment areas of the tanks of the selected beneficiaries from the selected villages.

Planning for the Reconstruction work: Another key step is to have detailed plan to identify the contractors for construction work and procurement of quality materials. It is suggested that the planning is undertaken in consultation with the village-level committees. The vendors are to be identified through a transparent cost analysis and a transparent process. The beneficiary households will also commit to unskilled labour for the reconstruction work (of catchment areas) for the tanks owned by them.

Completion of the Reconstruction work: It is proposed that a minimum of 330 tanks are considered for intervention considering the dire requirements for water as well as, for optimising the costs.

Training of the beneficiary household members: As a broad sustainability effort and strategy to revive interest of the community in existing assets and their proper upkeep, it is proposed that the beneficiary household members together with Village level Committees be sensitised on proper maintenance of the water tank structures andthe procedures to treat water of these tanks at regular intervals. Public Health and Engineering Department will also be involved in supplying the materials for water treatment while Panchayat members will ensure that the supplies come through.

Sharing of the Outcome and Success stories through Workshop: It is further proposed that there be Process Documentation as well as, documentation of the overall Outcome of the intervention. These must be developed as documents that share both best practices as well as shortfalls and what could be done better. These documents will be important resources for the Government, for any scale up of the initiative across more blocks of Barmer district or to other districts of the state of Rajasthan. District or state level workshop could be

organised to promote the inclusion of such low-cost measures to improve access to safe drinking water in the state.

PROJECT PLANNING MATRIX

A Logical Framework (Log Frame) approach is recommended for ensuring the planning and execution of the work. Project Planning Matrix will also help capture this intervention's short- and long-term objectives and the means to assess Results.

Project Matrix (LFA)			
		Verifiable Indicators	**Sources of Verification**
Long term Objectives	Household save money in obtaining water	Amount spent by households in getting water supplies	FGDs with beneficiaries
	Women saves time	Total amount of time women save	FGDs with beneficiaries
	Health of household members remain free from water borne diseases	% of beneficiary households not reporting any water related gastrointestinal problems	Health records with ANM and impact reports
Immediate Objectives	Tank gets recharged with rain water	% of Tanks and % filled up during the year	Photographs and records of Beneficiaries
	Households obtain water for drinking from the tanks	% of Households who obtains drinking water from these tanks	Records of water use
	Water supplies is ensured round the year	% of Households using the rain water round the year	Records of water use with purposes
Outcome	Committee formed and beneficiaries selected	% of village committee involved in selection	Photographs and meeting records of the committee
	Vendors completed the rehabilitation	% of the vendors sticking to the schedule of construction	Photographs of work execution
	Beneficiaries trained in water management are doing as per training inputs	% of the beneficiaries using the training in treatment of water	Photographs and water testing reports

Activities	Formation of a Village Level Committee	% of Villages having the committees	List of members of the committee
	Identification of Beneficiaries	Number of beneficiaries selected	Beneficiary list with documents
	Identification of Vendors for construction	% of Vendors applying for construction and selected	Report of meetings of committee to select vendors.
	Training of the beneficiaries	% of beneficiaries trained	Photographs of Trainings
	Construction work	% of constructions work happening as per schedules	Photographs of construction phases

PROJECT LOCATION & TARGET

RAF Global has identified the suitability of the above interventions in 79 villages falling across 22 Panchayats These 79 villages have about 13,000 households belonging to SC, ST and the General Castes. The distribution of population across these three sections is as below.

TABLE 5: CASTE DISTRIBUTION IN THE PROJECT VILLAGES

SC	ST	General (including OBC)
15.6	3.7	80.7

Source: Jal Jeevan Mission

The above cited 22 panchayats have 79 villages and 431 hamlets (see annexure 1). Except for two villages, Bhukha Bhagat Singh and Godara ka Sara, with about 237 households, all the remaining households are not covered under the *Har Ghar Nal Yojana*. Water testing across these 79 villages show that at least 75 villages have water with high salinity. It makes the drinking water supplied under various Government schemes unfit for human consumption. ANNEXURE 1 provides broad information of the proposed villages (habitation and households) along with water quality related information.

The project aims to rehabilitate 330 Tanka within the 79 villages enlisted in annexure I as per the vulnerability of beneficiaries identified by the consultative process completely backed by the village level committee. The proposed interventions would be carried over 3 years.

SUSTAINABILITY OF THE INTERVENTION

When positive results of a project intervention is sustained, desirable impact is created over a period of time. RAF Global suggests broad strategies under the proposed intervention for higher probability of making the intervention areas in the Barmer district water secure in future, through existing water harvesting structures or *tankas*.

Broad Strategies towards Sustainability:

1. Formation of Committee at the Panchayat level
2. Building the stake of beneficiaries in the rehabilitation work
3. Giving due weightage to technical component of the design
4. Capacity building of the beneficiaries (in upkeep, maintenance of structures and maintaining good water quality)
5. Ensuring synergies with agencies

We broadly elaborate here on this aspect.

Formation of Committee at the Panchayat Level: The committee will be tasked to identify eligible beneficiaries and inform them about the repair and role of these beneficiaries during the construction phase. They will also oversee the construction being carried out by the selected contractor and ensure that standards are followed during the construction phase. The committee could be entrusted with the responsibility of making payment to the contractors, post their acceptance of the work and completion of various stages of the work.

Building the stake of Beneficiaries in the rehabilitation: Except for beneficiary households comprising elderly persons and PWD (Persons with disability), the beneficiary households will provide their labour during the reconstruction of the catchment area around the water tanks. In its intervention areas, RAF Global had set an estimated five labour days per family as the contribution of the beneficiary household whose water tank undergoes rehabilitation.

Technical feasibility of the design: The earlier design left the catchment around the tank without any masonry work. The understanding was that the water precipitating will overflow and gather inside the tank. However, with scarce rainfall, this design may not allow much of the water to become runoff so that less quantity will get collected. The revised, proposed plan by RAF Global has shown that the catchment area including the tank, could be made about 92 sq meters, resulting in a collection of about 92 litres with every mm of rainfall. The masonry work will also help collect water free from soil, sand and other elements, which may improve the quality of stored water.

Capacity building of the Beneficiaries: Capacity building of beneficiary familiesis proposed, particularly before the onset of the monsoon months, to reinforce good water and sanitation practices. These efforts could be undertaken not by implementing agency alone, but together, with the panchayat committees. During the post-reconstruction phase throughout the year, the committee members will also conduct several visits to see and discuss the

upkeep and maintenance issues with the beneficiaries. With regards to the water quality, every habitation will be assigneda person who will carry out sample water quality tests once every three months to check the presence of E-Coli in the water and suggest appropriate measures to treat the water.

Ensuring Synergies with other departments: Since water quality is a critical component that will determine or sustain the benefits of the tank rehabilitation initiative, synergies with health department is essential. Testing the water and taking suitable action to treat the water must be done in association with the committee and the departments. Sourcing of alum, potassium permanganate, chlorine tablets, lime etc., will have to be done, and the committee's role at the village level will be crucial. The capacity building of the beneficiaries will help create both, the environment and the demand for such low-cost initiatives.

In short, the initiative does not start and end with reconstruction and rehabilitation of underground water tanks to conserve rainwater. It goes beyond infrastructure creation and makes an effort towards improving the understanding and practices of the beneficiaries on the quality of water that they consume. It will ensure that the intervention remains central to the household's concern and will be self sustaining.

PROPOSED BUDGET

For the above proposed intervention involving 330 units of existing underground water harvesting tanks in Barmer district in the state of Rajasthan, RAF Global projects a programme cost estimate of Rs 1,10, 55,000, mainly towards construction of catchment area of the tanks. The Operational Overhead Cost for an implementing agency like RAF Global will be an additional 20 percent of the estimated programme cost. As an implementing agency, RAF Global will bear 10 percent of the total project cost. A detailed break up of budget is provided below. The cost will be spread over 3 years.

Budget for Water Tank Catchment Reconstruction Intervention in Barmer by RAF Global						
S. No.	**Budget Head**	**Name of the Unit**	**Unit Cost**	**Total No of Units**	**Total Cost (for 3 years)**	**Budget rationale**
A	**Program Cost**					
A1	Community Consultation to ensure transparency in the process	Meeting	500	330	1, 65, ,000	Expenses towards meeting (Travel, Tea, other stationery items, etc)

A2	**Construction of** the Catchment Area of Tank (Circumference of a 12 Foot Diameter Circle)	Catchment	33000	330	1, 08, ,90,000	Expenses towards material, transportation of material to villages, water, skilled labour cost, paid volunteers **(Details of the unit expense is given in the table 4 above)**
	Sub-total (A)				**1, 10, 55,000**	
B	**Operational Overheads**					
	Staff Salary, Project travel, Stationaries, Communications, Electricity, public relations, etc				20% of the project cost (Sub-total A)	If required, detailed breakup of operational cost would be submitted.
	Sub-total (B)				**22,11 000**	
	Grand-total (A+B)				***1,32, 66,000***	

Total Grant requested from Donor	**1, 19, 39, 400**
Contribution from RAF Global (10% of the project cost)	**13, 26, 600**
Total Cost of the Program for 330 beneficiary families	***1,32, 66,000***

ANNEXURE 1: ACCESS TO WATER & WATER QUALITY IN PROPOSED 79 VILLAGES OF 22 PANCHAYATS COVERING 3 BLOCKS OF BARMER DISTRICT

	Block	Panchayat	Villages	Habitation	HH	Population	Problem	TAP	PWS	RWHS (proposed)
1	Payla Kalan	Ed-Sindhari	DabarBhatiyan	12	134	803	Salinity	0	Yes	
			ED Amar Singh	9	186	870	Salinity	0	Yes	
			ED Sindhari	12	343	2235	Salinity	0	YES	
2	Payla Kalan	ED Manji	Ed Manji	5	143	677	Salinity	0	YES	
			KardaliNadi	9	237	1423	Salinity	0	Yes	
			Vanako ka Bera	6	123	735	Salinity	0	Yes	
3	Payla Kalan	Ram Devra	Nimbali	9	296	1460	Salinity	0	Yes	
			Ramdevra	15	431	2180	Salinity	0	Yes	
4	Payla Kalan	Kagon Ki Dhani	Kagon Ki Dhani	10	145	932	Salinity	0	Yes	
			Niriya Nada	10	178	1062	Salinity	0	Yes	
			Tankon Ki Dhani	4	90	620	Salinity	0	Yes	
5	Payla Kalan	Khariya Khurd	JethaniSaranon Ka tala	4	100	738	Salinity	0	Yes	
			KeherniSaranon Tala	4	135	811	Salinity	0	Yes	
			Koshalu	7	321	1970	Salinity	0	Yes	
6	Sindhary	Nakora	GehunwalaNadi	1	119	645	Salinity	0	**No**	
			Lohira	7	287	1797	Salinity	0	Yes	
			Nokhra	11	418	2618	Salinity	0	Yes	
7	Sindhary	BhukhaBhagatsingh	BhukhaBhagatsingh	9	490	2908	Salinity	9	Yes	
			Derpana	3	139	629	None	0	Yes	

			Ghachira	4	242	1704	Salinity	0	Yes	
8	Sindhary	Banda Nada	Banda Nada	3	99	617	Salinity	0	Yes	
			Sajada	1	20	321	Salinity	0	Yes	
9	Sindhary	Sanpa Manji	Sajan Ki Dhani	7	133	840	Salinity	0	Yes	
			Sanpa Manji	6	227	1348	Salinity	0	Yes	
			Sodhon Ki Dhani	4	230	1282	Salinity	0	Yes	
10	Sindhary	Godara Ka Sara	Bhatiyon Ka Der	4	157	879	Salinity	0	Yes	
			Godara Ka Sara	5	228	1019	None	228	Yes	
			Sanpa Fanta	5	155	808	Salinity	0	Yes	
11	Sindhary	Kharantiya	Dhola Der	4	154	842	Salinity	0	Yes	
			Kharantiya	7	327	1768	Salinity	0	Yes	
			New Kharantiya	5	176	934	Salinity	0	Yes	
			Trisuliya	8	241	1417	Salinity	0	Yes	
12	Sindhary	Takuberi	NaiRanari	3	34	268	Salinity	0	No	
			Ranari	4	70	349	Salinity	0	Yes	
			Shakti Nagar	2	38	464	Salinity	0	No	
			Shiv Nagar (taku)	5	86	408	Salinity	0	No	
			Takuberi	8	77	682	Salinity	0	Yes	
13	Sindhary	Bilasar	Bilasar	3	131	739	Salinity	0	Yes	
			Dhane Ki Dhani	9	258	1921	Salinity	0	Yes	
			Gosai Nagar	3	135	729	Salinity	0	Yes	
			Jasnath Nagar	2	86	480	Salinity	0	Yes	
14	Sindhary	Kamthai	AwariBheemji	4	29	234	Salinity	0	Yes	
			AwariChosira	1	21	152	Salinity	0	Yes	
			Kamthai	5	99	549	Salinity	0	Yes	
			Mahadev Pura	1	36	173	None	0	Yes	
			NaiKamthai	4	67	441	Salinity	0	Yes	
			Peeprala	2	25	79	Salinity	0	Yes	
15	Sindhary	Dandalli	Dandali	4	312	1817	Salinity	0	Yes	

			Gangali	3	46	282	Salinity	0	Yes	
			GirliKitpal	5	144	885	Salinity	0	Yes	
16	Barmer	Dablisara	Abhaniyon Ki Der	4	152	951	Salinity	0	Yes	
			Bagasar	1	44	254	Salinity	0	Yes	
			Dablisara	7	235	1469	Salinity	0	Yes	
17	Barmer	Matasar	Daukio Ki Dhani	5	94	516	Salinity	0	Yes	
			East Matasar	5	143	903	Salinity	0	Yes	
			Matasar	5	172	1016	Salinity	0	Yes	
			Navji Ka Pana	6	194	1185	Salinity	0	Yes	
			South Matasar	6	140	872	Salinity	0	Yes	
18	Barmer	Adarsh Chava	Adarsh Chava	6	195	1224	Salinity	0	Yes	
			Gule Ka Nada	6	101	602	Salinity	0	Yes	
			Hunuman Nagar	5	113	712	Salinity	0	Yes	
			Indira Kalani	7	189	1119	Salinity	0	Yes	
			Kerli	6	175	1075	Salinity	0	Yes	
			Pooniya Ki Basti	6	191	1168	Salinity	0	Yes	
19	Barmer	Sarnoo Panji	Akal	8	144	810	Salinity	0	Yes	
			Indra Nagar	1	152	451	None	0	Yes	
			Ramnagar	1	105	630	Salinity	0	Yes	
			Sarnoo Panji	5	283	1465	Salinity	0	Yes	
			SarnooBhimji	7	252	1297	Salinity	0	Yes	
20	Barmer	SarnooChimanji	MoodhonkiDhani	7	134	784	Salinity	0	Yes	
			SarnooChimanji	7	263	1456	Salinity	0	Yes	
			Potliyasar	1	130	650	Salinity	0	Yes	
			Raikon Ki Dhani	6	260	1459	Salinity	0	Yes	
21	Barmer	Rawatsar	Premnagar	6	56	355	Salinity	0	Yes	
			Rawatsar	7	94	605	Salinity	0	Yes	
			Rawatsar East	5	66	400	Salinity	0	Yes	
			Rawatsar West	5	45	269	Salinity	0	Yes	

22	Barmer	Chava	Chawa	6	374	2275	Salinity	0	Yes	
			KharingaKua	6	117	677	Salinity	0	Yes	

			Grand Total	**431**	**1301 1**	**76193**	**0**	**23 7**	**0**	**330**

Source: Jal Jeevan Mission

** PWS: Public water supply*
**RWHS: Rain water harvesting structure*

ANNEXURE 2 :SUCCESS STORIES FROM THE INTERVENTION

STORY 1

Before Re-construction work

Paru Devi, a 35-year-old widow, lives in Bhatiya Der village of Sindhari block, Barmer district with her six children. Her husband died two years ago due to illness. Since then, survival had been a daily struggle. With a huge debt over her, taken during the treatment of her husband, spending money on the repair work was out of question for her. She feeds her kids with whatever money she gets from the widow pension and ration from the PDS shop. She has 3 goats which give her an income of Rs. 4,000/- annually.

During Re-construction work

With the re-construction of the catchment area of her sump tank, she will now save the money spent on buying the water. Moreover, now she would be able to get water for 7-8 months, as compared to 2 months post the monsoon season, as the runoff will be healthy resulting in better rain water conservation. The storage capacity of the tanks have also been enhanced.

After Re-construction work

STORY – 2

Bhuri Devi, is a 60-year-old widow, with two members in her family. Her only source of income is the widow pension and the meagre amount received from selling goat's milk. In 2009-10, under MNREGS, a *tanka* was constructed for her family. After 3 productive years, there was considerable damage in the *kuchcha* catchment area. Since then, the tankahardly stored1000-1200 litres of water. Her husband's illness and death thereafter,exhausted most of the family earnings on medical treatment. Re-construction of the *tanka* was out of question.

Before Intervention

During Re Construction work

After Re-construction work

Now, after the re-construction, she shares that during the monsoon, the whole tank would get filled and that would be sufficient for her for 7-8 months, post the monsoon season. This would mean that she would not have to spend money on buying water and filling the tank with the water tanker.

STORY - 3

Before Re-construction work

After Re-construction work

Ramaram, is a 40-year-old differently abled man, from Godara Sara village of Sindhari block, Barmer district. He lives with his family of 5 – wife, two girls and one boy. His children are below 18 years. There is no earning member in this family. Re-construction work has been a relief to him as he would not have to depend on others or water tanker for his daily needs.

Before Re-construction work

After Re-construction work

Jugtaram, is a 70-year-old widower in Godara Sara village of Sindhari block, Barmer district who is survived with three children. He lives alone as his children live separately. The committee selected him in this initiative because he meets his ends with much difficulty. With no one to take care of him, he was in desperate need of support that would ease day to day struggle for securing water for drinking and domestic purposes.

STORY –5

Before Re-construction work

After Re-construction work

Eeshram, is a 70-year-old man from Godara Sara village of Sindhari block, with five members in his family. He had been sick for the longest of time, because of which a major chunk of the income was being spent on his treatment. To cater to their daily water needs, he was in his own re-constructing the catchment area of the tank. Seeing his determination, the committee members selected him and decided to support him on his efforts.