

Model Schools - Suvarna Jala

A Status Report



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INTRODUCTION

Suvarna Jala

The Suvarna Jala Yojana was initiated by the state government with the aim of providing drinking water in 23,683 rural government schools (which is almost half the number schools in the State). This scheme, implemented as part of the Karnataka state golden jubilee year celebrations, was funded to a tune of Rs. 7735 lakh. The programme was implemented by respective Zilla Panchayats utilizing the services of either Nirmiti Kendras or their own Engineering Departments.

In early 2007, Arghyam conducted a survey of this scheme in 7 districts (Chamarajanagara, Mysore, Davanagere, Chitradurga, Dharwad, Gadag and Tumkur) in order to find out the status of implementation. The findings indicated that out of the 1269 rainwater harvesting (RWH) structures completed by November 2006, only 11 per cent (140 structures) was functional.

Arghyam's model schools

Based on the survey, Arghyam made several recommendations to the state government to execute the rest of the scheme in a result-oriented way. In an effort to demonstrate the best practices in construction Arghyam also facilitated a network of rainwater harvesting (RWH) experts and grass-roots in 2007-2008.

The network was built in 7 districts with the aim of developing at least 2 model schools in each during 2007-08 (See Table 1 for list of schools and partner NGOs). In addition to this, repairing and reviving RWH systems constructed under Suvarna Jala Yojana, toilet blocks, awareness activities and maintenance plans were also put in place.

Creating model schools

The following efforts were implemented in the model schools:

- Promotion of concept of RWH and water conservation and application in schools.
- Creation of awareness about proper storage, handling and consumption of safe drinking water.
- Creation of consciousness about personal hygiene, sanitation and its practices among school children.

Table 1: Details of Arghyam implemented model WatSan Schools

Sl.No.	School	Village
District: Dharwad, Implementing NGO – BIRD-K		
1	Govt HPS	Kamadhenu
2	Govt HPS	Channapura
District: Gadag, Implementing NGO – BIRD-K		
3	Govt HPS	Binkadakatte
4	Govt LPS	Thippapura
District: Chitradurga, Implementing NGO – Geo Rain Water Board		
5	Govt HPS	Jadegondanahalli
6	Govt LPS	Ingaladahalli
District: Davanagere, Implementing NGO – Geo Rain Water Board		
7	Govt LPS	Mudalamachikere
8	Govt HPS	Gowdagondana halli
District: Tumkur, Implementing NGO – BIRD-K		
9	Govt HPS	Kunigal Timmanahalli
10	Govt LPS	Chikkannanahalli
11	Govt LPS	Badamaranahalli
12	Govt HPS	Yadaladaku
13	Govt HPS	Kerekyatanahalli
District: Mysore, Implementing NGO – CART and SUMANA		
14	Govt LPS	Doddahundi
15	Govt LPS	Kempamma hosuru
District: Chamarajanagar, Implementing NGO – CART and SUMANA		
16	Govt HPS	Kalanahundi
17	Govt HPS	Chikkati

- Ensuring people’s participation and community ownership among structures constructed.
- Development of management skills of School Development and Management Committee (SDMC) members of the schools and equipping them with necessary knowledge and skills to carry on the project after withdrawal of the project staff and support.
- Construction of new RWH structures and/ or renovation of RWH structures constructed under the Suvarna Jala Yojana.

Timeframe of project

As mentioned earlier, the network of NGOs, with financial support from Arghyam, began work on developing 17 model schools across 7 districts of Karnataka in order to showcase community-managed water and sanitation systems in 2007. Over a period of 6 months from the start of the project, gaps in the Suvarna Jala Yojana were identified and planning of need based activities for

sustainable management of the RWH structure in these schools was carried out. On 4th July 2008, interventions like infrastructure improvement, capacity building were launched in both the model schools and the local communities around these schools. The implementation of these interventions took about three months.

ASSESSMENT OF MODEL SCHOOLS

The idea behind creating model schools was to establish sustainable and efficient WatSan facilities in schools that last beyond the project period. In order to see if this effort had indeed succeeded in lasting beyond the term of intervention, Arghyam conducted a study in October-November 2009. The status of infrastructure, its operation, maintenance and usage were all studied to understand the scenario on the ground. Findings from the study are captured in this report

Objectives of this Study

The objective of the study was to assess 17 model schools spread across 7 districts of Karnataka with regard to RWH and sanitation, developed and supported by Arghyam in order to:

- Understand the status of functioning of RWH and sanitation units
- Analyse the technical and social reasons that lead to these systems functioning/ failing to function beyond the project period.
- Consolidate the outcome and make recommendations, where required.
- Design significant inputs/thumb rules for planning, implementation and sustainable maintenance of RWH and sanitation systems in schools.

Study Methodology

Data collection

Primary data

The evaluation used several approaches to collect qualitative, primary data from multiple stakeholders such as the Head Master of the schools, teachers, SDMC members, members of other school management committees, students and NGO partners/ agencies involved in the development of model schools. A combination of methods were used in the study to collect primary data, they include - transect walks, semi-structured individual interviews, focussed group discussions, open ended interviews, participant observation, informal interactions.

Secondary data

Secondary data was collected based on project reports from partner institutions on model school development and interactions with the Programme Manager and staff of Arghyam who oversaw the project.

Sample selection for evaluation

The 27 rainwater harvesting structures in the 17 schools (See Annexure 1) have been considered for this study.

Data/Information Collection

A pilot survey was conducted in Govt HPS, Kamadhenu village of Dharwad district. This was done to test the robustness draft formats/questionnaires prepared for different respondents and get inputs for finalizing the formats for other model schools' survey.

All the data/ information collected and presented herein is the primary data. The survey was conducted between October-November 2009. A combination of methodologies was used to collect information. As mentioned earlier, a wide range of stakeholders were consulted in order to ensure factual accuracy of data.

Limitations of the Study

While every attempt has been made to ensure factual accuracy of the study, there may still be a danger of the study reflecting subjective perceptions of the respondents on some aspects. This may in turn reduce the reliability of data/information to a degree.

FINDINGS FROM THE STUDY

The first part of this report focuses on the RWH initiative. A detailed analysis of their status with regard to use and type of use, with reasons for the same has been presented.

The second part of the report focuses on sanitation – since structures have been renovated and focus has been paid on increasing hygiene awareness.

RAINWATER HARVESTING

As indicated in the introduction, 17 model schools were selected for the project. There are 27 RWH structures in these schools. These structures were constructed using Arghyam fund; others constructed using funds from Suvarna Jala Yojana of which a majority were renovated using funds from Arghyam. Exact details of construction/ renovation of RWH structures (See Annexure 1) are as follows:

- 14 structures constructed using Arghyam funds. In 3 schools Arghyam funds were not used for construction of rainwater harvesting structures. These include the Government LPS in Chikkannanahalli and Badamaranahalli villages in Tumkur district and Kempamma hosuru village in Mysore district.
- 11 structures constructed under the Suvarna Jala Yojana and renovated by Arghyam.
- 2 structures constructed under Suvarna Jala Yojana and not renovated by Arghyam funding

Categorisation of model schools

In order to understand the success of the model school project beyond the project period, the functioning and defunct RWH structures were identified.

In this Report RWH structures are categorised as **functioning** if they are:

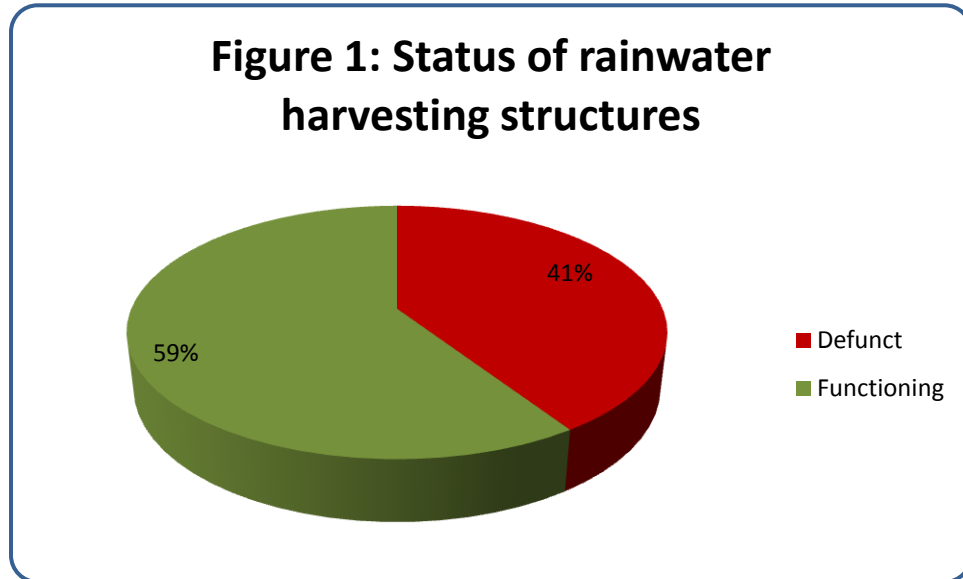
- regularly used for drinking
- occasionally used for drinking
- regularly used for other purposes than drinking
- occasionally used for other purposes than drinking

Rainwater harvesting structures are considered **defunct** if they are:

- completely defunct and therefore in disuse
- partially defunct but in disuse.

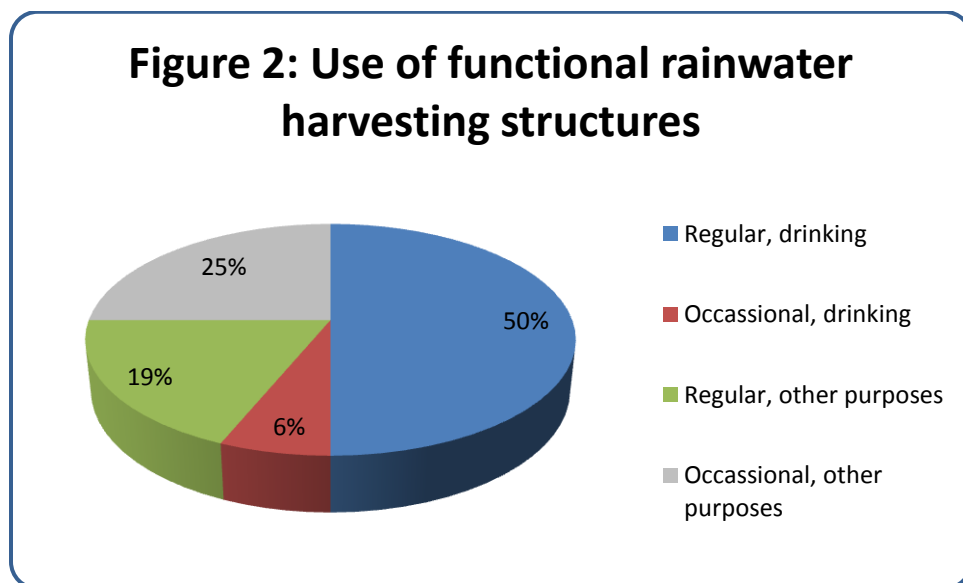
Outcomes for 17 model schools

The study indicated that 16 structures are functioning and the other 11 schools (41%) are defunct (See Figure 1).



Functional structures

A further examination of functioning structures indicated the following usage pattern (See Figure 2):

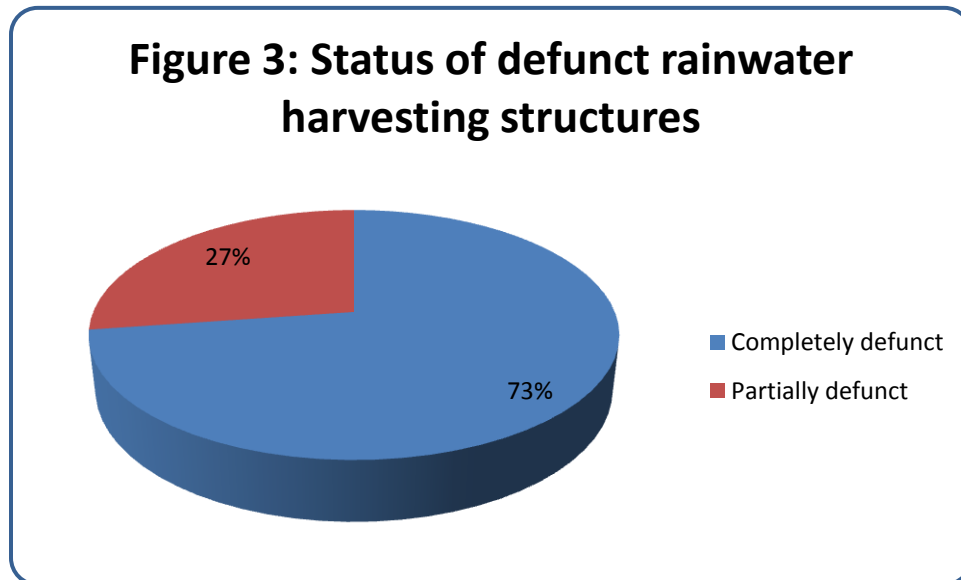


- 8 structures - used regularly for providing drinking water
- 1 structure - used occasionally to provide drinking water

- 3 structures - regularly to provide water for purposes other than drinking
- 4 structures – occasionally to provide water for purposes other than drinking

Defunct structures

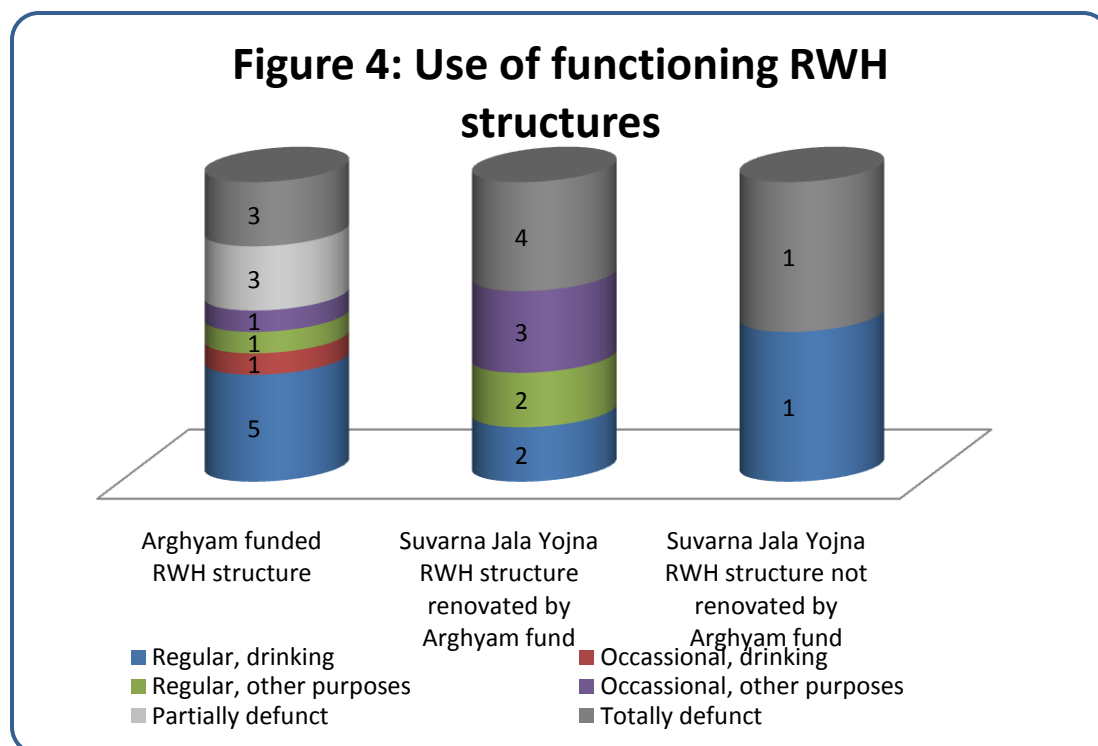
A similar analysis of the defunct structures (See Figure 3) indicates that:



- 8 structures - completely defunct
- 3 structures - partially defunct due to minor problems such as hand pump being in disrepair, etc. In some structures, it was found that though the water collected is useable, its use is prohibited/ hindered. For instance, one school in Gowdagondana halli village, Davanagere district demonstrated that though the hand pump was not working, the water could still be drawn using a bucket from the sump temporarily till repairs are carried out.

Understanding outcomes

As the primary purpose of construction of the RWH structures was to provide drinking water, results are also understood based on their use (See Figure 4).



It is evident from Figure 4 that while 63% (5 out of 8) of functional RWH structures constructed using Arghyam funds are used for providing drinking water, only 29% (2 out of 7) of functional RWH structures that were constructed under the Suvarna Jala Yojana are used to provide drinking water. However, 71% (5 out of 7) of these renovated structures are used to provide water for other uses either regularly or occasionally.

The reasons for both use of RWH structures and type of use as identified can be attributed to a variety of reasons. These include:

- Water quality issues – mainly fluoride contamination
- Maintenance issues and availability of other water sources in plenty
- Experience of NGO in working in that particular region

Each of these factors will be examined in detail in this report.

Functional RWH structures and Fluoride contamination and other water quality problems

Findings from the study indicate that the areas that 10 of the 17 schools (with a total number of 17 RWH structures) are present in have serious problems of Fluoride contamination. These include Thippapura village, Gadag district; Chitradurga, Davanagere and Tumkur districts. In fact, it was seen that one of the reasons for selection of these schools as model schools was itself due to the fluoride problem in the area.

A breakup of the presence of RWH structures in Fluoride affected areas indicates that:

- 57% (8 out of 14) of RWH structures constructed using Arghyam funds;
- 73% (8 out of 11) of RWH structures constructed under Suvarna Jala Yojana and renovated using Arghyam funds and
- 50% (1 out of 2) of RWH structures constructed under the Suvarna Jala Yojana and not renovated using Arghyam funds

are present in areas with Fluoride contamination.

It is also important to understand if this automatically translates into them being well used and therefore functional beyond the project period.

The study showed that at least one of the RWH structures continued to be used to provide water for drinking or other purposes even after the project period in 7 out of 9 schools where Fluoride content was high even though other sources of water were available in plenty (See Annexure 2). Further, it was found that where only one of either Arghyam constructed or renovated RWH structure was available (2 out of 7 instances) it was found to be working (Annexure 2). In instances where both were available both were found to be functional in 2 out of 7 instances and at least one was found to be functional in 3 out of 7 instances. Completely dysfunctional RWH structures were found in only two of the nine schools, where problems with maintenance led them to fall into disrepair. In 4 out of the 9 schools drinking water was sourced from the RWH structures (See Annexure 2).

In some cases such as the Government HPS schools in Binkadakatte village, Gadag district and Jadegondanahalli village, Chitradurga district conjunctive use of Arghyam funded RWH structures and renovated RWH structures was also seen. Thus, the water from the Arghyam supported RWH structure was used for drinking purposes while the structure renovated with Arghyam funds was used to provide water for other purposes.

It was also observed that even when the Arghyam funded RWH structure was defunct; the government structure was not used for drinking but only for other purposes (See Annexure 2). The reason for this was explained in Gowdagondana halli, Davanagere and Yadaladaku, Tumkur as follows – the practise of conjunctive use was followed in both schools till maintenance issues cropped up and the Arghyam funded RWH structure became defunct and the practice of using Arghyam renovated structures for secondary uses continued. In fact in Gowdagondana halli, the semi structured interviews indicated that water that was collected in the Arghyam funded RWH was still withdrawn using buckets (since the hand pump was in disrepair) and used for drinking. However, this claim is not verifiable.

Other kinds of water quality problems were also seen to influence use of RWH structures, though to a lesser extent. For instance, in the Government HPS, Binkadakatte, Gadag, the RWH structure functioned well and was used regularly for drinking. This was because, even though there was no fluoride contamination in the area, the groundwater available in the school was found to be sour and tanker water had to be bought once a week. A similar situation exists in

even the Government LPS in Thippapura, Gadag where both quality and quantity issues of other water sources make the use of rain water inevitable.

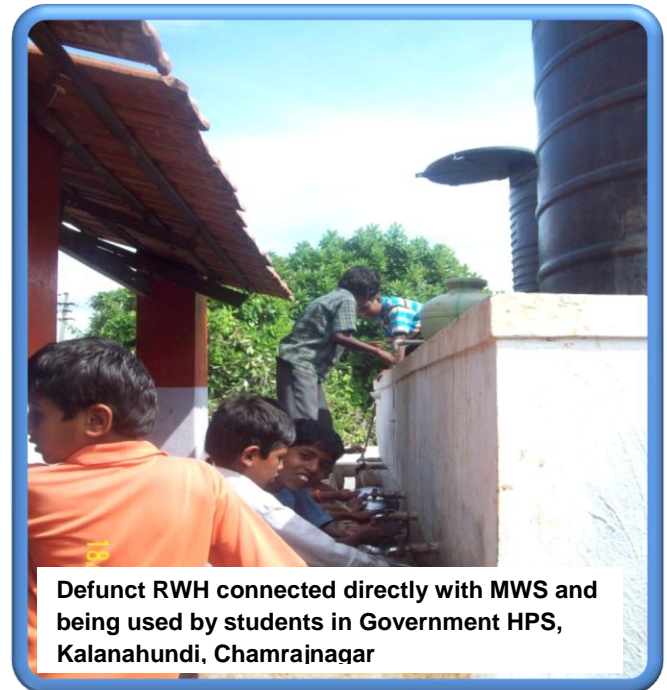
Dysfunctional RWH systems, maintenance issues

As discussed earlier, 16 of the 27 RWH structures are functioning while 11 are defunct. Of these 11, 8 are completely defunct and 3 are partially defunct. In some cases the RWH structures have been dysfunctional for such a long time that the defunct RWH structure's tank is directly connected to the government MWS and used as was the case in the Government HPS in Kalanahundi, Chamrajnagar (See Figure: .

A serious issue that contributed to the RWH structures becoming defunct was found to be vandalism during holidays by students of the same school or from neighbouring areas. This caused damage to the pipes of the RWH structures in 2 schools (Govt LPS, Chikkannanahalli, Tumkur and Government HPS, Kalanahundi, Chamarajanagar).

It is clear from Table 2 that there a number of wide ranging reasons for the 11 RWH to become dysfunctional. These include: minor repairs in hand pumps such as valve replacements to the hand pump being broken; structural problems that arose immediately after construction (in the case of 2 schools where RWH structures were constructed under Suvarna Jala Yojana); tank leakage all contributed to the failure of the RWH structures.

It is evident that in most cases where RWH structures are partially defunct, they could be easily restored if if regular maintenance is carried out. Simple maintenance regimes, which include a regular watch and ward on the school, ensuring that the school's gates are closed etc. could be effective in preventing vandalism.



Defunct RWH connected directly with MWS and being used by students in Government HPS, Kalanahundi, Chamrajnagar

Table 2: Reasons for RWH structures becoming defunct

S.No	Structure	Problem with pipe system	Problem with handpump	Poor water quality	Availability of other sources in plenty	Tank leakage	Structural fault at construction
I. RWH STRUCTURES COMPLETELY DEFUNCT							
I.a. Arghyam funded RWH structure							
1	Government HPS, Channapura, Dharwad	Y	Y	Y	Y	-	-
2	Government HPS, Yadaladaku, Tumkur	Y	-	-	Y	-	-
3	Government HPS, Kalanahundi, Chamarajanagar	Y	-	-	Y	-	-
I.b. Suvarna Jala Yojana RWH structure renovated by Arghyam fund							
4	Government HPS, Channapura, Dharwad	Y	Y	Y	Y	-	-
5	Government LPS, Ingaladahalli, Chitradurga	Y	Y	-	Y	Y	-
6	Government LPS, Mudalamachikere, Davanagere	-	-	-	Y	-	Y
7	Government LPS, Chikkannanahalli, Tumkur	Y	-	-	Y	Y	-
I.c. Suvarna Jala Yojana RWH structure not renovated by Arghyam fund							
8	Government HPS, Kamadhenu, Dharwad	-	Y	-	Y	-	Y
II. RWH STRUCTURES PARTIALLY DEFUNCT							
II.a. Arghyam funded RWH structure							
9	Government HPS, Kamadhenu, Dharwad	-	Y	-	Y	-	-
10	Government LPS, Mudalamachikere, Davanagere	-	Y	Y	Y	-	-
11	Government HPS, Gowdagondana halli, Davanagere	-	Y	-	Y	-	-

Poor maintenance and availability of other sources of water

Poor day to day maintenance is another important reason for the failure of RWH structures.

Several instances demonstrate that the lack of maintenance of RWH structures have caused them to become defunct.

In some schools, the water from the RWH structure was found to be infested with worms and unclean. In others, the system lay defunct for trivial reasons such as a loose screw in a hand pump not being fixed. In 2 instances, pipes that were removed were never replaced – in one of these instances they were removed to renovate the building (Government HPS, Yadaladaku, Tumkur) and in the other broken pipes were not replaced as the building was expected to be renovated (Government LPS, Chikkannanahalli, Tumkur).

One of the main reasons for poor maintenance was found to be the availability of other sources of water in plenty (which includes groundwater or water from the government Mini Water Systems). From Table 2 it is evident that this is the case in all the cases where the RWH structures have stopped functioning. In fact, it was seen that even where water quality problems (especially Fluoride contamination) existed, these sources continued to be used to provide drinking water to children in 2 schools (Govt HPS, Yadaladaku, Tumkur and Govt LPS, Chikkannanahalli, Tumkur).

Functional RWH structures and experience of NGOs

The relationship between the partner NGO and the community was another key factor that determined the success of the interventions. It was seen that, where the partner NGO had a good rapport with the community, the entry and acceptance of an idea was easier. For instance, from Table 3 it can be seen that more RWH systems are functioning well in Tumkur and Gadag districts where BIRD-K has been working for a longer period with both this and similar projects. Extended contact between the NGO and the community also facilitated handholding of the community beyond the project period in order to ensure that the RWH structures are functioning.



Students in Government LPS, Thippapura, Gadag district, students show enthusiasm in maintaining and using RWH structure

Table 3: Status of rainwater harvesting structure and partner organisation

S.No.	District	Implementing Partner	Total RWH structures	Functional RWH Structures
1	Dharwad	BIRD-K	2	0
2	Gadag	BIRD-K	2	2
3	Chitradurga	Geo Rain Water Board	2	2
4	Tumkur	BIRD-K	5	3
5	Mysore	CART and SUMANA	2	2
6	Chamarajanagar	CART and SUMANA	2	1
7	Davanagere	Geo Rain Water Board	2	0

PART 2 – SANITATION

Improving sanitation facilities and creating hygiene awareness were also components of the ‘model school’ building. The study focussed on understanding the success of sanitation related interventions based on the following parameters –

1. Presence and use of sanitation facilities
2. Hygiene practices followed.

Presence and use of sanitation facilities

The study indicates that of the 17 schools one school – Government HPS, Chikkati, Chamarajanagar district did not have toilet/urinal. All the others had a toilet/urinal.

Table 4 Reasons for sanitation facilities becoming defunct

School	Village	District	Reason for becoming defunct
Govt HPS	Gowdagondana halli	Davanagere	The only one toilet in the school appeared dysfunctional and unkempt.
Govt HPS	Kunigal Timmana Halli	Tumkur	Used when there is water supply from the syntax tank. The toilets are unkempt
Govt HPS	Kerekyatanahalli	Tumkur	Toilets unkempt.
Govt HPS	Kalanahundi	Chamaraja nagar	Used rarely as the water supply to taps is not working. This was because the connecting pipe was damaged during construction work of the adjacent class room.

Of the sixteen schools in which sanitation facilities were available, the toilets were dysfunctional in 4. Availability of and access to water played a critical role in determining the use and maintenance of sanitation facilities. Sanitation facilities worked well in schools where taps were present within the toilet/urinal. In most cases, this tap was in turn connected to a small pit/tank which was located in front of/inside the facility thus making water easily available to the facility. If the water source is located elsewhere, it necessitates the transport of water each time the

facility has to be used and in such cases; there was a tendency for the sanitation facilities to fall into disuse.

Even where sanitation facilities were present and working, it was not accessible to all students. For instance, in the Government HPS in both Channapura, Dharwad district and Gowdagondanahalli, Davanagere district, use of sanitation facilities was restricted to girls, teachers/ staff and boys had no access to them. A key reason for this was the lack of the requisite number of units of facilities to cater to the entire school.

Maintenance was another major determinant of functionality of sanitation facilities. In all the 16 schools the maintenance of toilets/urinals rests with the students with guidance from their teachers. It was seen that while the urinals were functional in most schools, the toilets were in a state of disrepair/disuse.

Hygiene practice

Hygiene practices were found to be predominantly lacking. Hardly 4-5 schools of the 17 had soap available in the toilets/urinals with children actually using them.

CONCLUSION

Several factors play a critical role in ensuring the successful implementation of a project or an idea after funding from external sources is withdrawn.

Follow up and hand holding of the school by the implementing agency on a regular basis for at least three to four years is a critical component to effectively transfer ownership of these structures to the school, according to representatives from the NGOs BIRD-K and Geo Rain Water Board. They point out that in some cases the school expresses the need to appoint a staff exclusively for maintenance of RWH structures.

Representatives from the 2 NGOs also emphasise the importance of the software component – which includes awareness raising among students, teachers, SDMC members and the general public should not be compromised as this also leads to ownership and demand generation.

Frequent testing of water quality and assessment of need for RWH could also be put in place to ensure that the structures are used well, especially where there is a need for them.

An effective SDMC and teaching fraternity and enthusiastic student body go a long way in ensuring that these structures work properly.

KEY LEARNINGS

The functionality of RWH structures is directly tied to the need for them. Thus they work well in areas where there are quality and/or quantity problems but do not if a regular water supply can cater to all the needs.

Key learnings in software, hardware and maintenance activities have emerged through this study, these are as follows:

Software

- Cooperation among different stakeholders viz. School students, SDMC members, public and the school staff, is imperative to ensure proper maintenance.
- In order to achieve such cooperation, awareness of use of RWH structures among all the stakeholders is critical.
- The leadership and interest of the school staff (including the Head Master) influences not only the construction and maintenance of RWH structure but also allied activities such as using the water to cultivate gardens.
- The enthusiasm and interest exhibited by the Student Committee is another key factor in ensuring success of WatSan initiatives in schools. The committee is formed to look after various aspects such as cleanliness of the school premises, garden, toilets, class rooms, watering plants, maintenance of RWH and other water sources, keep discipline, etc. It has helped all the students to be informed of the importance of RWH and they are in turn extending awareness to their households and the community at large.
- Follow up by implementation agencies (NGOs), for at least 2-3 years after the project is also important. This enables the schools to seek guidance and clarifications on challenges that they encounter in the use/ maintenance of RWH systems.

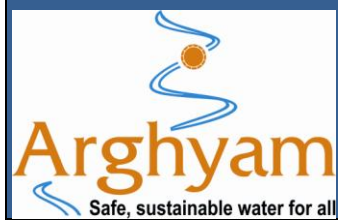
Hardware

- Ensuring technical correctness of the RWH structure is important. This includes proper slope of gutters, construction of tanks without leakage, proper filter, proper first flush separator and overflow arrangement, etc.

Maintenance

- Regular maintenance of the units is a key factor in ensuring functioning of RWH structures.

- Ensuring selection of a safe place for constructing RWH tanks and fixing the hand pump is critical. If the units are constructed inside a class room or a closed building, it becomes easier for the school to maintain and use them in the long term.
- Having a school compound (preferably a concrete structure) will help prevent vandalism.



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