Benefits/Issues and Status of WATSAN Systems

A Survey of WATSAN systems implemented in an IDWM project supported by Arghyam

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CONTENTS

1. Introduction of the Project where this Survey is conducted

There has been promotion of Roof top Rain Water Harvesting (RRWH) and eco-sanitation systems in various project areas through different partner organisations supported by Arghyam. One of such projects is implemented by MYRADA and MYKAPS in Bangarpet and H D Kote blocks respectively. Developing an integrated approach to domestic water management was the basic idea of the project. Construction of Roof top Rainwater Harvesting (RRWH) and Eco-sanitation toilets were focused in the same. Four villages viz. Kongarahalli and Gollahalli in Bangarpet; B Matakere and Nemmanahalli in H D Kote were selected with an objective to make these villages as models in integrated management of domestic water & sanitation in a rural set-up.

Project period: August 2006 to March 2011

2. Need for the Survey

In October 2010 Arghyam felt a need to understand the status of functioning of these systems constructed and analyse if there are any benefits/ limitations in the same. This study was to help Arghyam to look back to related strategies and modify them suitably, if needed, for future interventions. Hence this survey was planned to be conducted in the above mentioned four villages of the project.

3. Objectives of this survey

- To understand the usage status and issues/benefits of RRWH and eco-sanitation systems constructed under the Integrated Domestic Water Management project implemented by MYRADA and MYKAPS in Bangarpet and H D Kote blocks.
- To learn from findings of the survey and modify the strategies, if needed, for addressing water and sanitation issues more effectively in future.

4. Data collection

- Two surveyors were hired and oriented on the background of the survey and method of survey.
- A sample size of around 50% was taken up for this survey.

- Surveyors visited four villages viz. Kongarahalli and Gollahalli in Bangarpet of Kolar district; And B Matakere and Nemmanahalli in H D Kote of Mysore district for the survey of sample RRWH and sanitation systems.
- Interacted with beneficiaries – men, women and children – comprehensively to grasp their perceptions. Questionnaires were used to facilitate these interactions.

5. Sample size for the survey

From the four villages covered in this IDWM project total sample drawn sums up to 201 units. Village-wise sampling is shown as below:

	Total RRWH Units	Sample RRWH for the Survey	Total Eco-sanitation Units	Sample Eco-San for the Survey	Total sample for each village
Kongarahalli	56	28	62	26	**54**
Gollahalli	13	6	59	31	**37**
B Matakere	67	34	49	23	**57**
Nemmanahalli	5	2	102	51	**53**
Total	**141**	**70**	**272**	**131**	**201**

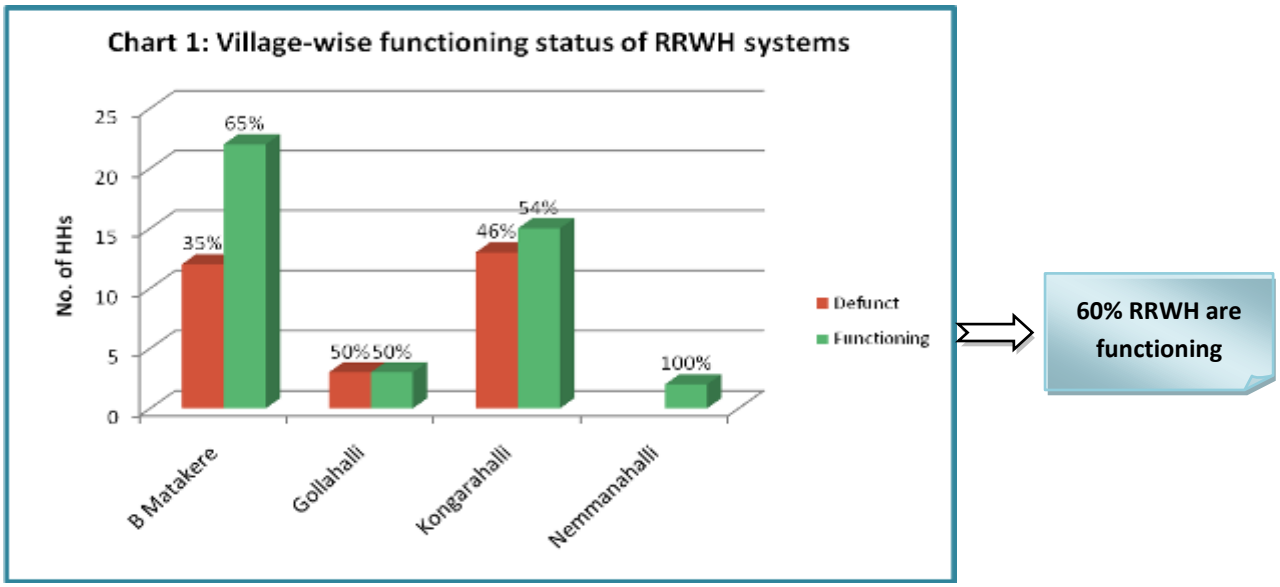
Total sample size for RRWH units = 70; and Eco-sanitation units = 131.

6. Findings of the Survey

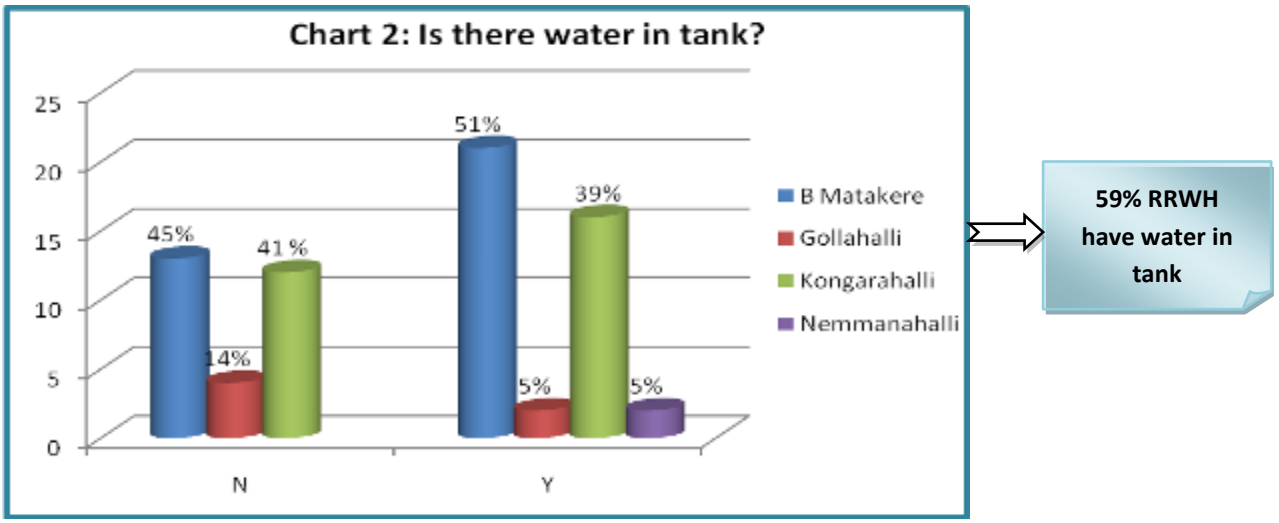
PART I: ROOF-TOP RAIN WATER HARVESTING (RRWH)

Note: Wherever village-wise picture is given, please remember that Nemmanahalli has totally 5 RRWH systems constructed. Among these only 2 were taken for the survey and hence results furnished in terms of percentages could be referred accordingly.

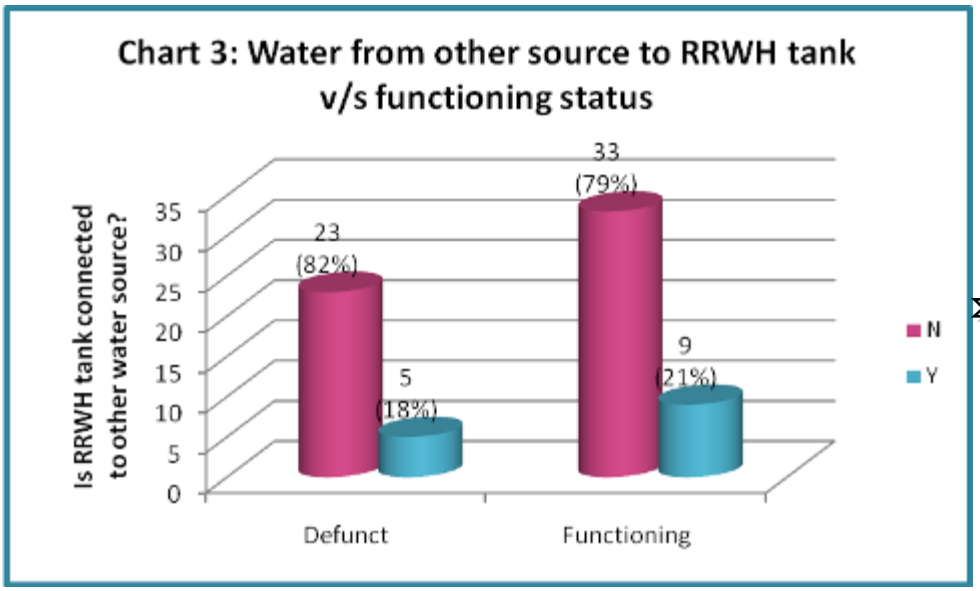
Functioning status: Around **60%** (42 units) of the systems surveyed are functioning. Village wise it counts to 2 HHs in Nemmanahalli (both the two systems surveyed out of five constructed are functioning), 22 (65%) in B.Matakere, 15 (54%) Kongarahalli and 3 (50%) in Gollahalli are functioning.



Water in tank: At the time of survey, around **59% (41 units)** had water in the tank. Out of these 41 units that have water in tank around 21 (51%) belong to B Matakere, 16 (39%) to Kongarahalli and 2 (5%) each in Gollahalli and Nemmanahalli.

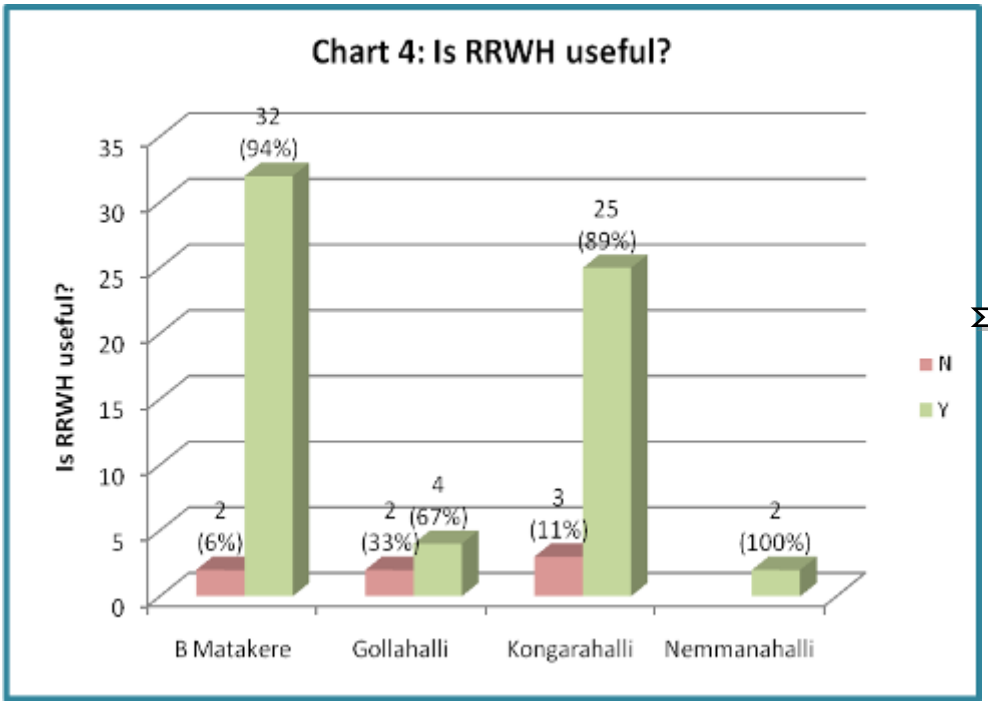


Other source of water v/s functioning status: **14 units (20%)** out of 70 surveyed RRWHs are connected to other sources of water such as bore-well, Mini Water Supply, etc. Among these 14 units 9 are functioning and 5 are defunct as in Chart 3. Other **56 units (80%),** which are not connected to other sources, 33 (79%) are functioning and 23 (82%) are defunct.



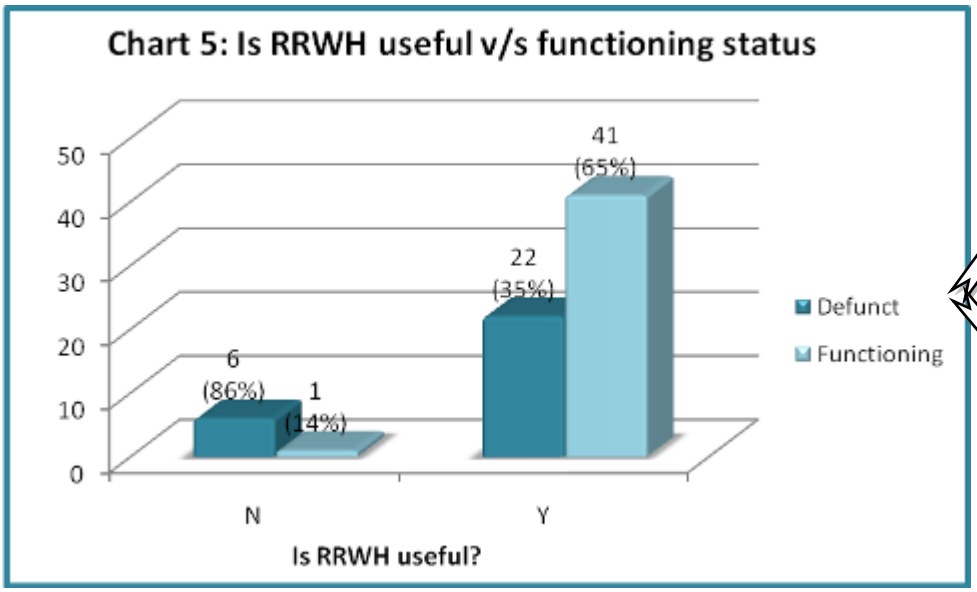
20% RRWH are connected to other sources of water

Usefulness v/s functioning status: Around **90% (63 HHs)** express that RRWH is useful. This perception on usefulness varies village-wise, like 32 RRWHs in B.Matakere followed by 25 in Kongarahalli, 4 in Gollahalli and both 2 in Nemmanahalli.



90% HHs express that RRWH is useful

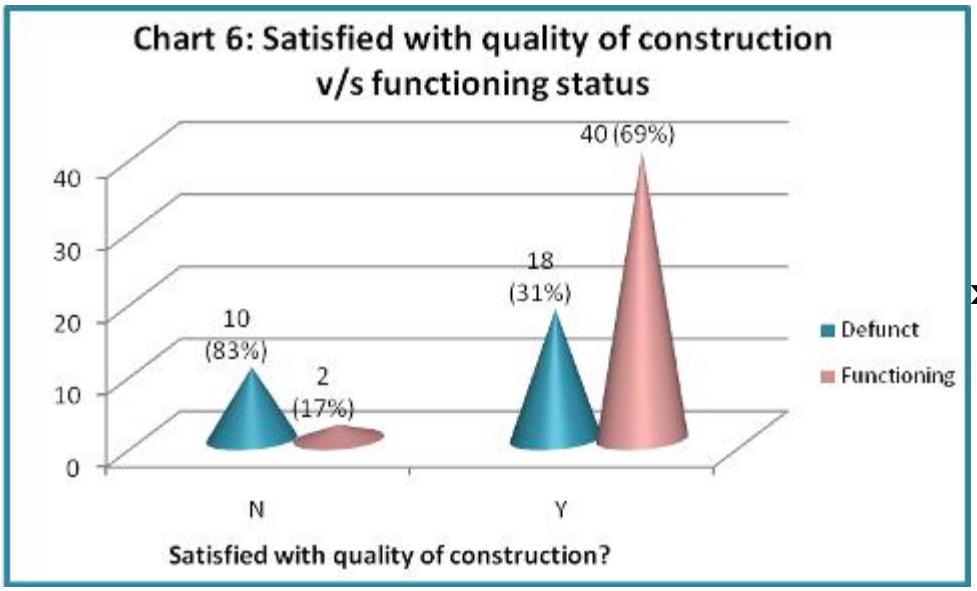
Out of 90% (63 units) who said RRWH is useful 22 are in defunct state. Out of 7 who say it is not useful, only one is functioning well (Chart 5).



Among 90% HHs who say RRWH is useful, 65% are functioning

Among 10% HHs who say RRWH is not useful, 14% are functioning

Satisfaction v/s usage: Around 83% (58 units) out of total units surveyed opine that they are satisfied with the quality of construction. Among those 58 units, 18 (31%) are defunct and other 40 (69%) are functioning. On the other side, out of those who said that they are not satisfied with construction, 2 (17%) are functioning.



83% HHs express satisfaction with quality of construction out of which 69% are functioning

If the above charts (5 & 6) are combined we get the below table.

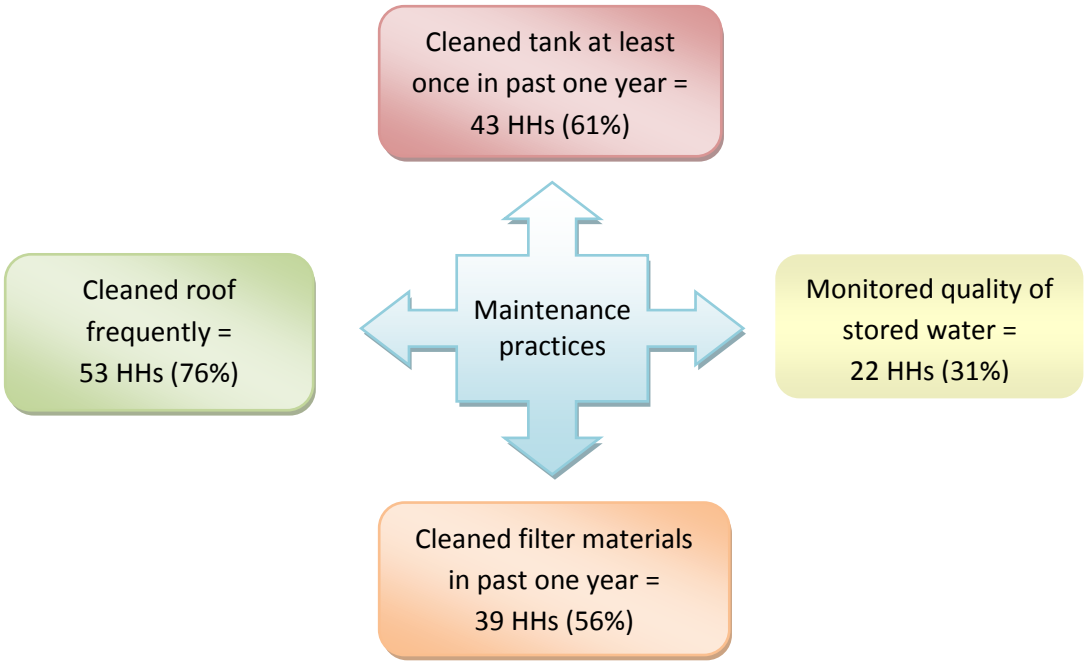
	Not satisfied with construction		Satisfied with construction		Grand Total
Is RWH useful?	**Defunct**	**Functioning**	**Defunct**	**Functioning**	
No	6	0	0	1	**7**
Yes	4	2	18	39	**63**
Grand Total	**10**	**2**	**18**	**40**	**70**

Apparently 39 HHs (56% of total surveyed) who have satisfaction with quality of construction and express that RRWH is useful have their systems functional. 18 HHs (26% of total surveyed) have satisfaction and say that RRWH is useful, but those systems are defunct. 4 HHs (6% of total surveyed) say that RRWH is useful but are not satisfied with quality are construction have their systems in defunct state.

Maintenance of RRWH

- Got any training/ participated in any exposure visit? = 49 (70%) said Yes
- Aware of maintenance protocols = 61 (87%) said Yes
- 79% said gutter pipes are working well.
- **First flush v/s RWH functioning status:** 67 (96%) out of 70 say that using first flush is convenient. Out of these 67 only 42 RWH systems (63%) are functioning.
- **Cleanliness around the tap:** 15 (21%) out of 70 have water stagnation problem around the tap.
- **Water quality:** 22 (31%) HHs say that their RWH water quality is tested. Among those 22 only 12 (55%) say that water is potable, one (5%) says it is not potable and other 9 (41%) say they do not know the results of the test.

Chart 7



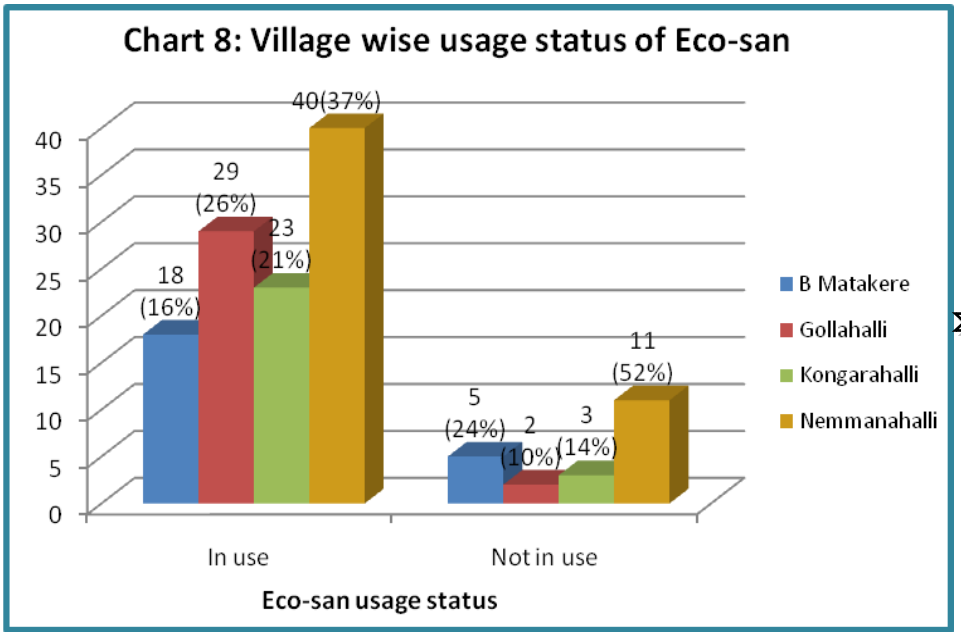
Suggestions for improvement of RRWH: 41 HHs express they do not have anything to suggest. Other 29 HHs suggested some improvements in RWH systems. Major suggestion was that ***'it is better if have underground tank'*** [20 HHs (29%) say this]. On the basis of observation and interactions, reasons for this suggestion might be that - they think it is safer, its space consumption on the ground can be avoided or useful for those who do not have ground space for the tank.

Some other suggestions came up during the survey are – need for bigger opening to tank to help easy cleaning; better quality of construction especially tank so as to avoid leakage; cover whole roof, etc.

Suggestions by Beneficiaries	B Matakere	Gollahalli	Kongarahalli	Nemmanahalli	Grand Total
No suggestions	25	2	12	2	**41**
A bigger opening to the tank to get into and clean easily	1		1		**2**
Bigger tank and tap	1				**1**
It will be better to have underground tank	6		14		**20**
Provision to clean tank		1			**1**
Quality of construction should be better			1		**1**
Tank bed should be properly made with cement so that water doesn't soak.	1				**1**
Tank should be constructed on ground not on boulder; have to replace the tank somewhere else as it leaks		1			**1**
Tank should be still smaller, should be of good quality		1			**1**
Want to cover whole roof so that they can catch lot of water; provision to clean tank		1			**1**
Grand Total	**34**	**6**	**28**	**2**	**70**

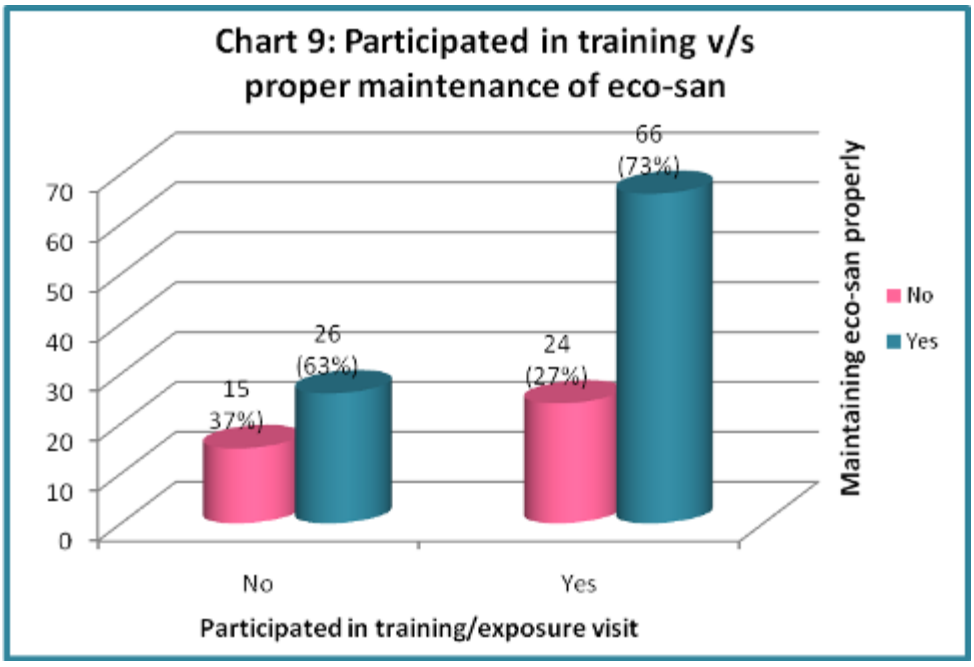
PART II: ECO-SANITATION (Eco-san)

Functioning status: **110 (84%)** eco-san systems out of 131 are being used. Village wise status - 29 (94%) eco-san systems in Gollahalli are functional/ in use followed by 23 (88%) in Kongarahalli and around 40 (78.4%) in Nemmanahalli and 18 (78.3%) in B Matakere.

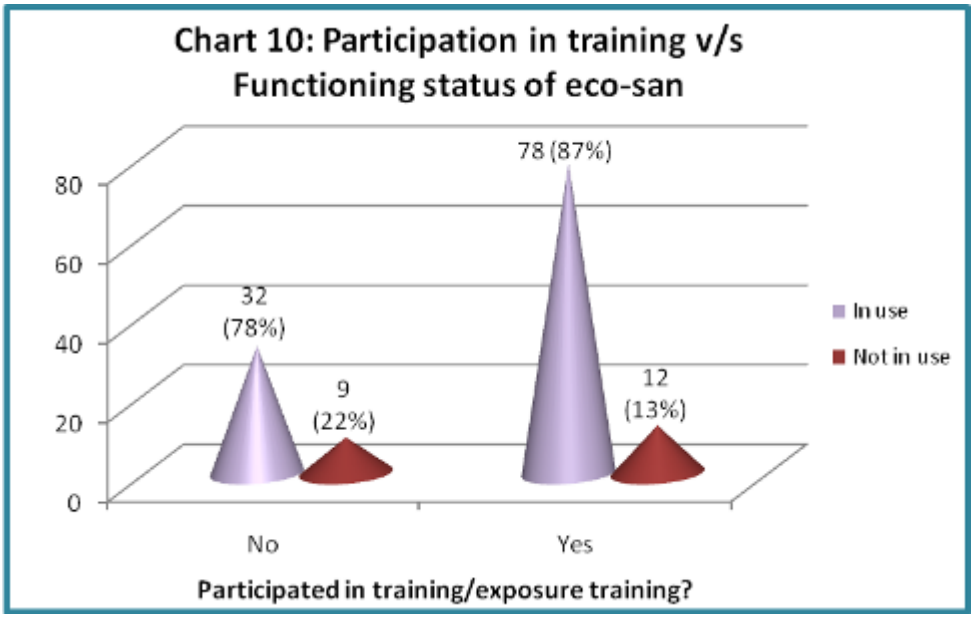


110 (84%) Eco-san systems are functioning

Participated in exposure visit or training v/s using eco-san properly: Among **90 HHs (69%)** who participated in either exposure visit or training, 66 HHs (73%) are using eco-san properly (that means they are using ash, not letting water go into pits, etc). Among **41 HHs (31%)** who didn't participate in any visit or training, 26 HHs (63%) are using it properly.

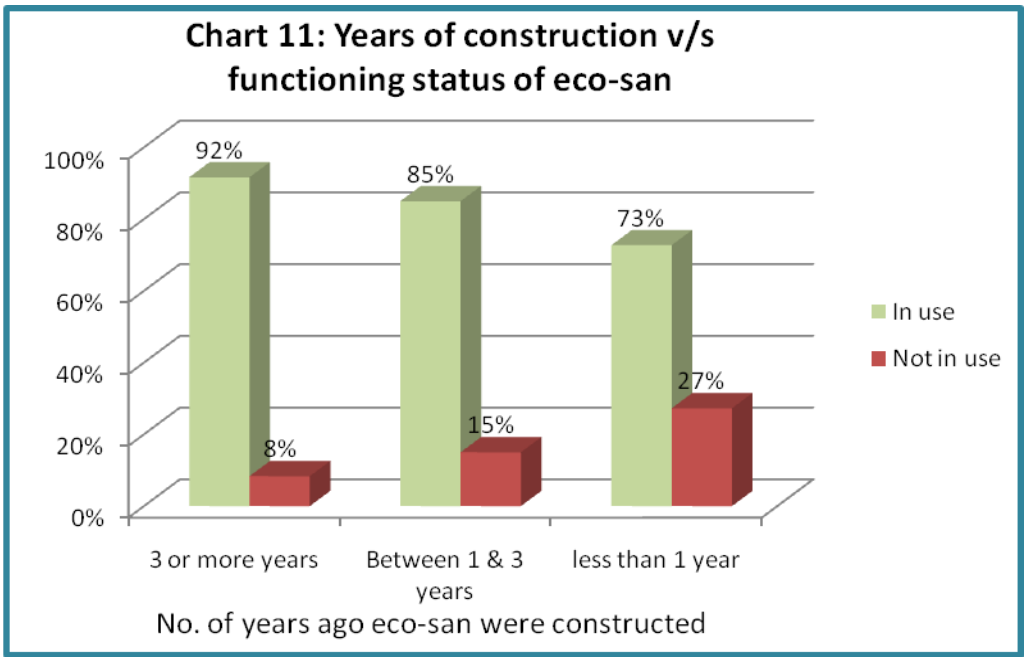


As mentioned above 90 HHs participated in training or exposure visit. Among them 78 units (87%) are functioning well. Among 41 HHs who didn't participate in training or exposure visit 32 HHs (78%) are properly using the systems as in the chart 10.



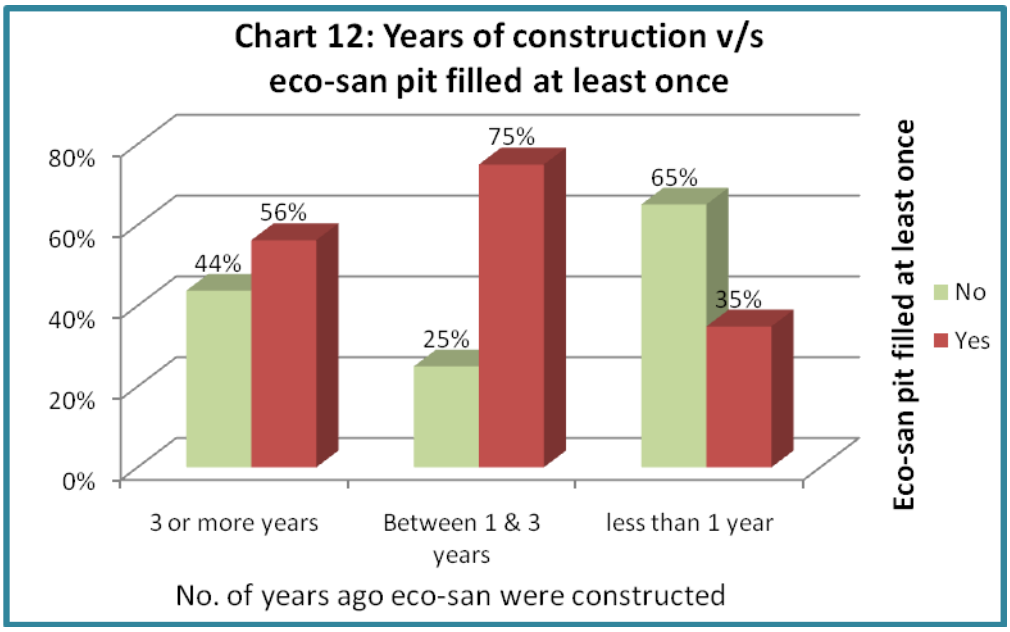
Why chose eco-san? All but one HHs (130) convey that they chose eco-san because MYRADA/ MYKAPS motivated them. The other one HH is influenced during the exposure visit.

Construction year v/s functioning status: It is notable from the chart 11 that 92% of the eco-san constructed 3 or more years ago are functioning where as only 73% of the units constructed one year ago are functioning. And among those constructed between 1 and 3 years ago 85% are in use. ***This shows that old constructions are in better use than the recently constructed eco-san systems.***

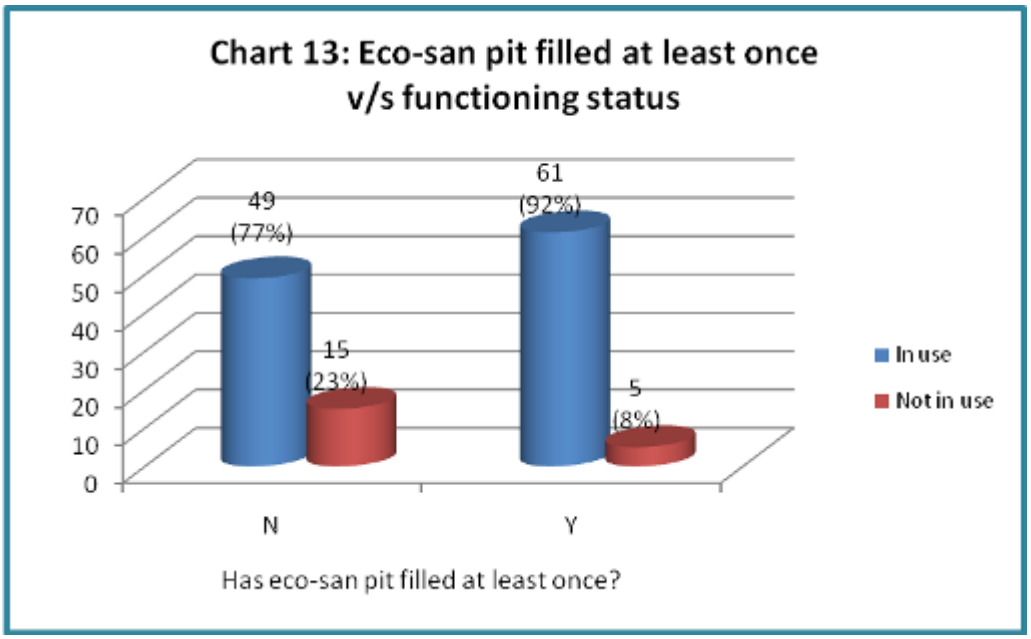


The above chart could be interpreted in another way. Among those eco-san systems which are functioning 47% are constructed 3 or more years ago and 34% are constructed one year ago. Remaining 18% are constructed between 1 and 3 years ago. ***This phenomenon also stresses the above point that eco-san systems constructed 3 or more years back are in better functioning status than those constructed later.***

Pit filled at least once: **50.4% (66 HHs) say that eco-san pit is filled-up at least once.** Chart 12 shows that 56% of the eco-san constructed 3 or more years ago are (pits) filled up at least once and 35% of the units constructed one year ago are (pits) filled up at least once. Among those constructed between 1 and 3 years ago it is 75%. ***It is evident that those eco-san units constructed 3 years ago are even though in functioning status (as in chart 11) but are either not being used regularly or properly leading to ineffective filling up of the pits at least once.***

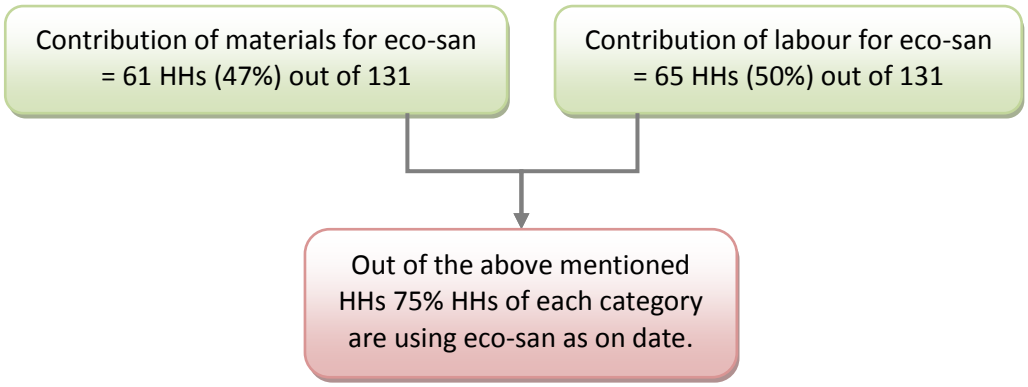


Among 50.4% (66 HHs) eco-san pits filled-up at least once, as on date, 92% are in functioning status. Other 8% are defunct systems due to various reasons. Out of 64 HHs whose eco-san pits are not filled at least once, 23% are defunct and 77% are functional **(Chart 13).**

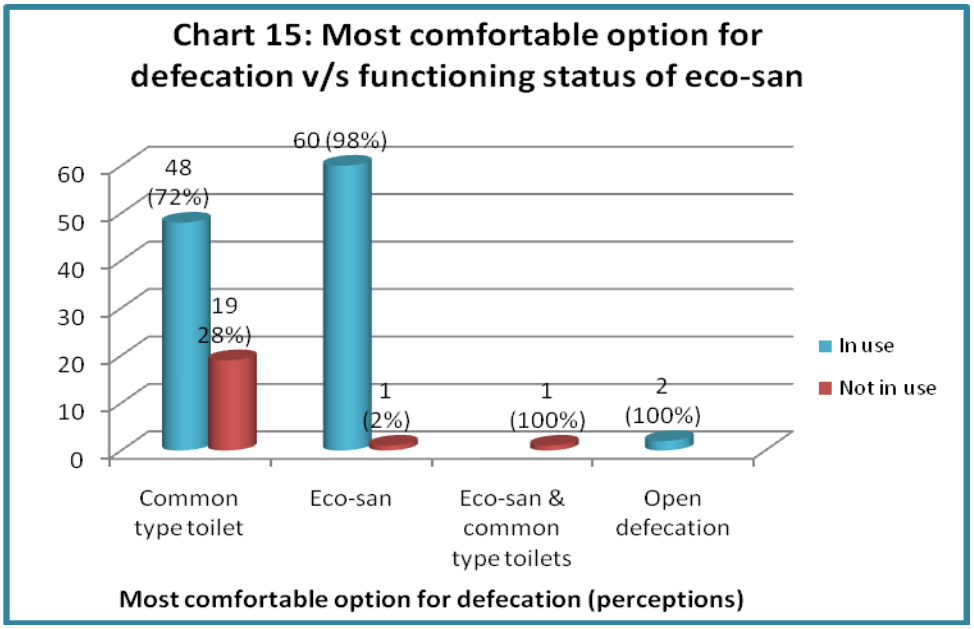


Contribution v/s functioning status: 61 HHs contributed materials out of which 46 (75%) are using eco-san now. 65 HHs contributed labour in constructing the unit in which 49 (75%) are functional (Chart 14).

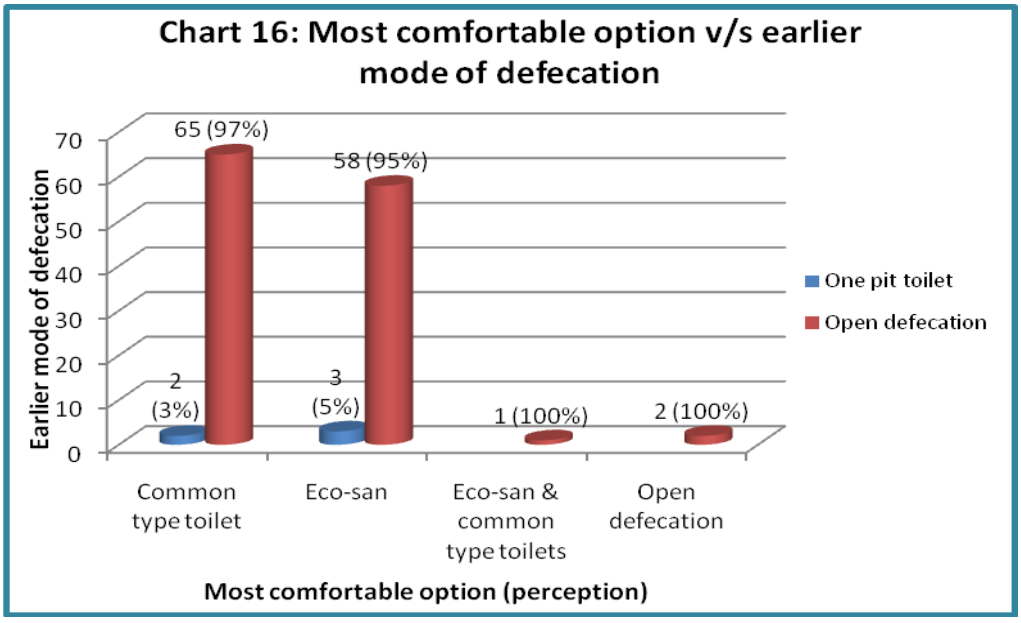
Chart 14:



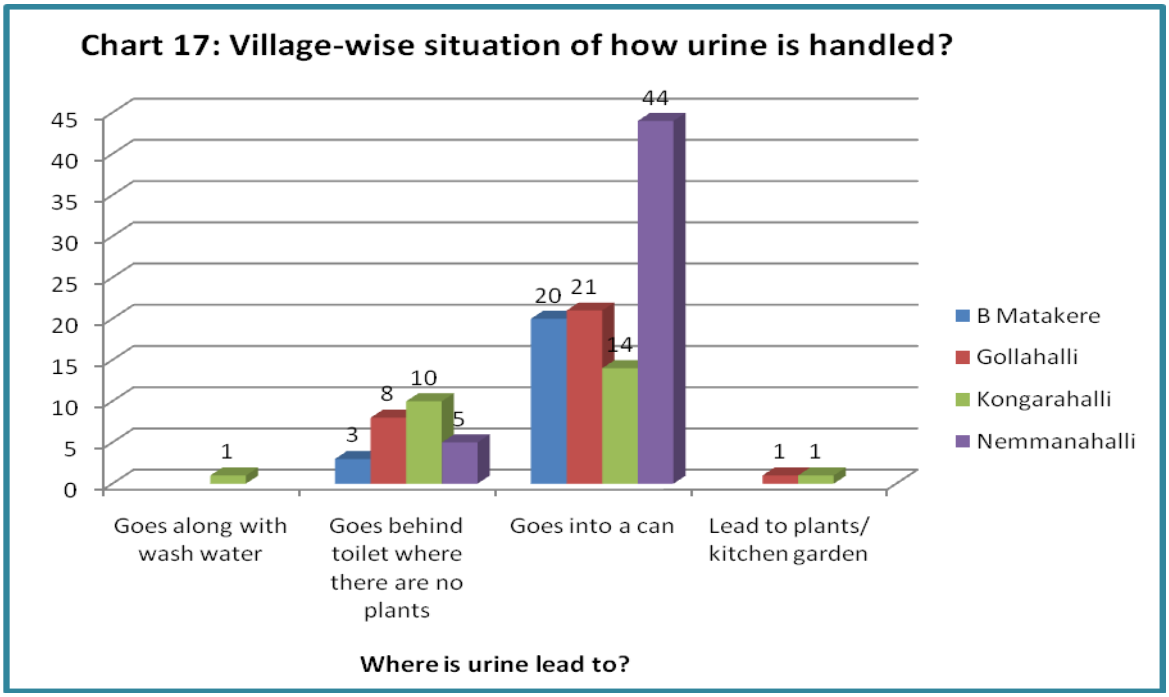
Most comfortable option for defecation v/s eco-san functioning status: Chart 15 depicts the perceptions of beneficiaries against the functioning status of the systems. Among those 51% of total surveyed HHs who say that their most comfortable option of defecation would be common type toilet around 72% are using eco-san as on date. 98% are using eco-san where they say their most comfortable option is eco-san only. Two HHs convey that they like open defecation but both of them are using eco-san. Only one HH says that both eco-san and common type toilets are comfortable and have their own advantages.



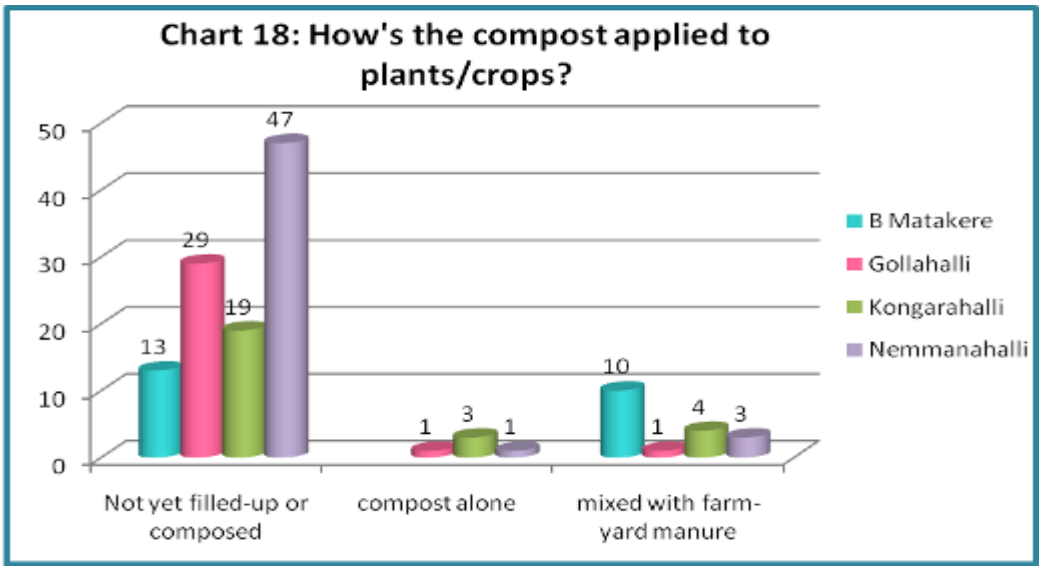
Most comfortable option v/s earlier mode of defecation: Among eco-san beneficiaries who express that their most comfortable option is common type toilet 97% used to go for open defecation previously. And among those whose most comfortable option is eco-san 95% used to go for open defecation (This is only their opinion/perception on most comfortable choice).



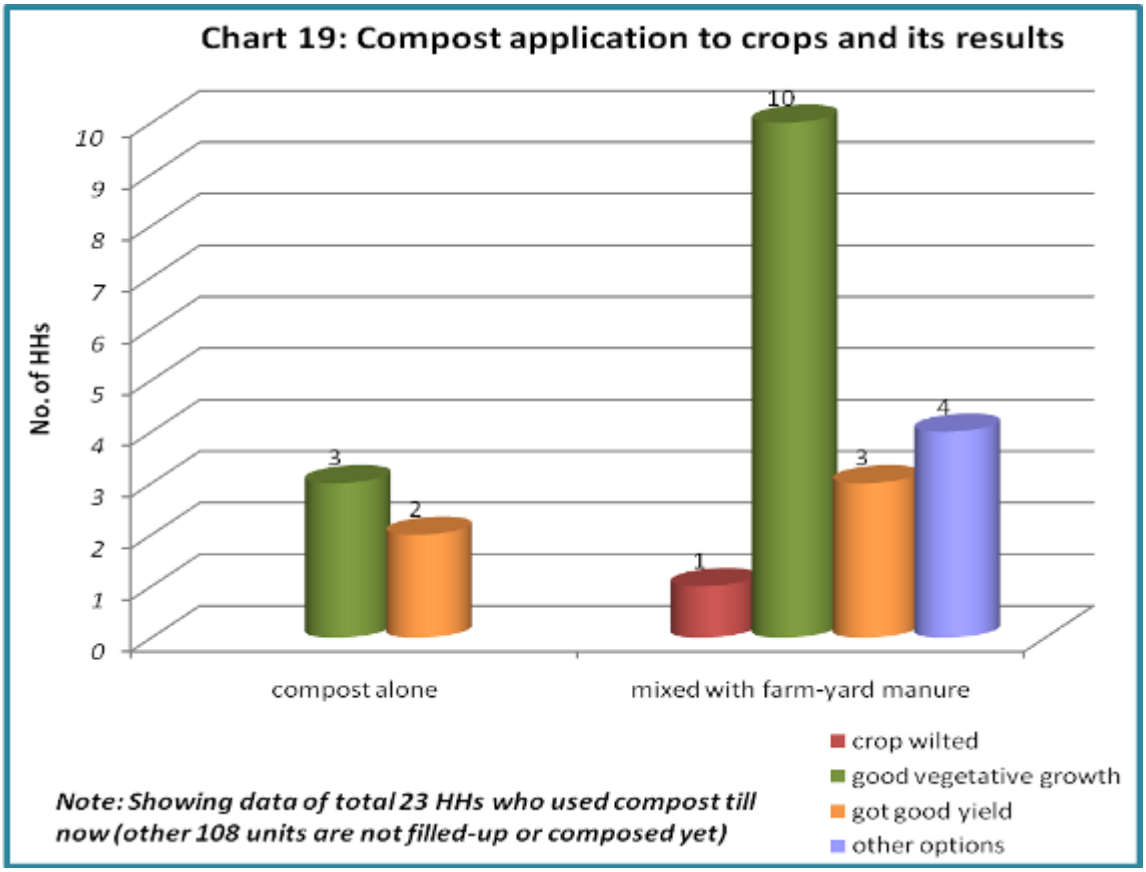
Handling urine: 75.6% (99 HHs) use *can* to collect urine where as 20% (26 HHs) let urine go behind toilet where there are no plants. Others let it flow to plants or leave it to join drainage. Village-wise data comparison conveys that urine is lead into can highest in Nemmanahalli followed by Gollahalli. Only two HHs (one from Gollahalli and another from Kongarahalli) said that they lead urine to plants/kitchen garden. ***Hence it can be inferred from Chart 17 that still majority of the HHs are not convinced with the usefulness and importance of urine to apply for plants/ fields for better yield (instead use manure only).***



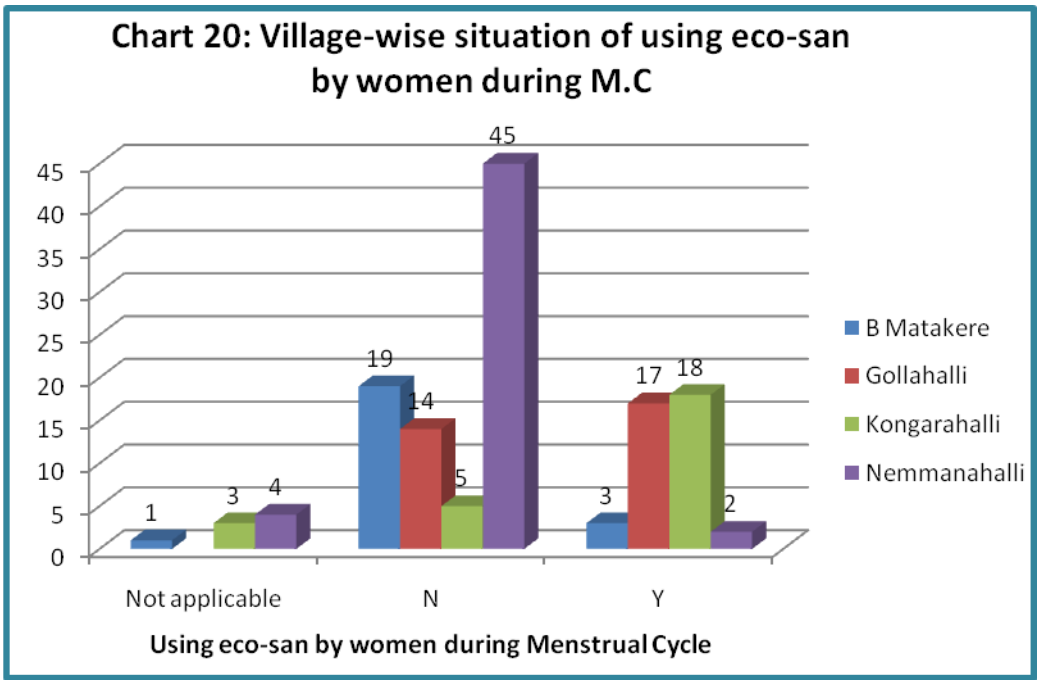
Using compost: 23 HHs i.e 17.5% (out of 131) have used eco-san compost to apply in their fields, among whom 18 HHs have used it by mixing with farm yard manure and 5 others say that they used it directly. Chart 18 depicts that only in B Matakere the eco-san compost mixed with farm-yard manure is being applied to crops. In other places it is either directly applied or mixed with farm-yard.



Result of using compost: Out of 23 HHs (17.5%) who applied eco-san manure in their fields 13 (57%) say that crops got good vegetative growth, 5 (22%) say they got good yields, one express that crops were wilted (Chart 19) and other 4 (17%) convey that they couldn't check for results because (a) crops were eaten by pigs (b) is been only 3 months and still to see results (c) neutral about the impact (neither good nor bad), etc. Most of these 23 HHs have used compost to crops such as cotton and ragi. Few have applied it also to jowar, tobacco, paddy, tomato, beans, etc.



Women using eco-san during Menstrual Cycle (M.C): Around 63% (83 HHs) express that they do not use eco-san during their M.C and 30.5% (40 HHs) say they use it. Among those who say they do not use it 81 HHs (out of 83) go for open defecation and other 2 use neighbour's flush toilet during M.C. Comparatively in Kongarahalli and Gollahalli more women say that they use eco-san during their M.C.



What's most liked w.r.t Eco-san system?

More than 50% opined that they like Eco-san because of the compost they can get from it. Around 17% like eco-san as it consumes less water. 15% are glad that it is useful especially for women and at night. Others express that this system is good as they need not go far for open defecation, saves time, useful during rainy season/ ill health or at night, etc.

It is notable here that more than 50% like it because of manure but till now only 17% of 131 surveyed HHs have used the manure and around 50% of the total units/pits are filled-up which are decomposing the manure.

Suggested improvement in Eco-san: 62 HHs convey that they do not have anything to suggest and other 69 HHs suggest for some improvement in eco-san. Among these 69 HHs, **56 (81%) said they like it to be on ground level like common type toilet.** This is because, as they express, it is difficult for older and younger ones to climb steps to use eco-san. However 40 (71%) out of these 56 units are functioning. Others suggested various aspects such as - better quality of construction; should be bigger with more space between two pits; urine pipe should be bigger; want only one pit; shouldn't smell bad and insects shouldn't increase, etc.

Suggestions by beneficiaries	B Matakere	Gollahalli	Kongarahalli	Nemmanahalli	Grand Total
No suggestions	6	16	25	15	**62**
Basin should be properly placed		1			**1**
Bigger; more space b/w two pits		1		2	**3**
Door should be wider; urine pipe should be bigger				2	**2**
It is not clean; insects are developed		1			**1**
On ground level like common type toilet	17	9		30	**56**
Quality of construction should be better		3	1		**4**
Should be only one pit				1	**1**
Shouldn't smell bad; and mosquitoes shouldn't increase				1	**1**
Grand Total	**23**	**31**	**26**	**51**	**131**

7. Conclusion

Around 60% RRWH and 84% Eco-san systems of the surveyed samples are functional. With regard to RRWH around 59% units had water in tank. Though there were some quality problems causing leakage in tanks most of reasons for defunct systems were – not keeping the pipes clean leading to blockage in filter/ water flow; broken tap; poor maintenance practices (as in Chart 14) such as irregular cleaning of roof/ filter materials/ tank, etc. ***Hence latter should be improved by emphasized capacity building and hand-holding activities in the communities.***

With regard to eco-san, even though 84% are in use only 50% of them (pits) are filled up at least once. Also, even though 92% of the systems constructed 3 or more years ago are functioning as on date, they are not in regular/ proper use for which only 56% of them (pits) are filled up at least once. And only 17.5% HHs have applied manure to their fields. 51% of total surveyed HHs opine that they like common type of toilet and not ecosan. 47% still say that they like to use eco-san. ***Majority suggestions were on the design of the system*** such as- it should be on ground level to ease older and youger ones to use it; more distance between two pits; difficult to use for women during their M.C.; have to use water in the same place where they defecate, urine pipe should be bigger, etc. Apart from these suggestions, as per the survey results and observation, using eco-san properly is also an issue because putting right amount of ash, not letting water into pit, leaving the pit for proper period for decomposition after it fills up, etc. are the ***maintenance protocols that yet have to be strongly imbibed in the communities for sustainable use of the systems. More awareness creation and hand-holding on how and when to use urine and manure could also be concentrated upon.***