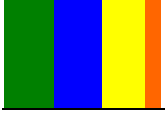


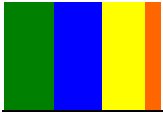
F O R C E



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DECEMBER 2017

Maintenance Status of Rainwater Harvesting Structures in Gurgaon

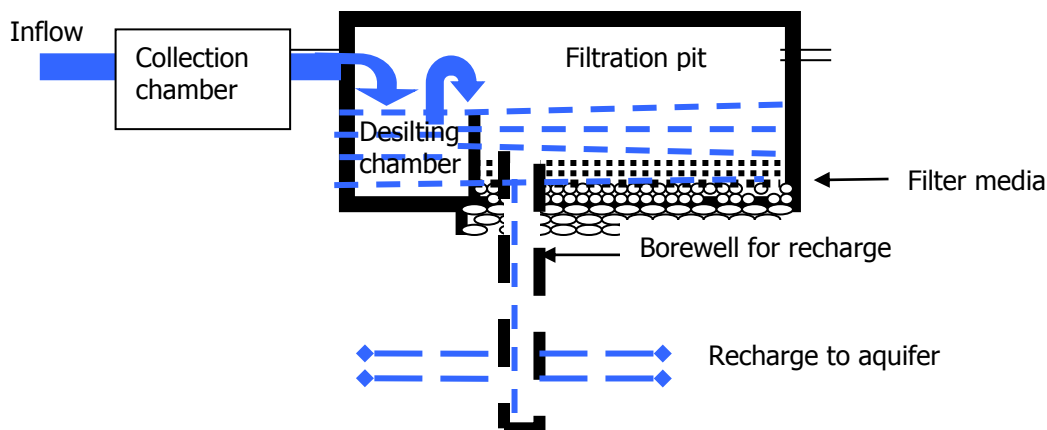


BACKGROUND

NEED FOR MAINTENANCE

Rainwater Harvesting has emerged as a widely accepted method of augmenting groundwater reserves of an area. In urban settings, the method used most often is – ‘Artificial recharge to groundwater using recharge pits with recharge wells’.

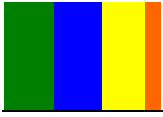
In this method, water is collected from rooftops and open areas into a recharge pit and then, through a borewell, is artificially re-injected back into the active aquifer in the area. The recharge pit consists of a desilting chamber and a filtration tank. The desilting chamber stores water initially so that the sediment in the water settles down. The relatively clean water from the top moves into the filtration pit, where boulders, gravel and pea gravel (filter media) are arranged in such a way that they replicate the earth’s natural filtration mechanism.



Using this method, in Delhi (which gets only 611 mm of rainfall a year) a 100 sq.m. rooftop area can be used to recharge as much as 48,000 litres of water a year. This volume is more than twice the annual drinking water requirement of a family of five members.

However, the efficiency of this Rain Water Harvesting system depends upon several factors:

- 1) **The design and maintenance of the inlet conduits / chambers** - Collection chambers / conduits are the primary collectors of rainwater runoff from the storm water drains or from open surfaces. Unless they are entrance points are kept free of debris, they are not able to channelize all the available runoff. Also if they have silt/debris deposits, they are not able to hold the runoff long enough for it to enter the recharge pit.
- 2) **The level of maintenance of the desilting chamber** – From the inlet, the rainwater first enters the Desilting Chamber. Here, the suspended silt in the water is deposited at the base of the chamber, while the clean water from the top



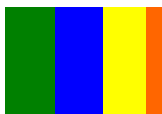
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- flows into the filtration pit. The silt deposited at the bottom of the Desilting Chamber needs to be cleaned regularly. If this is not done, the capacity of the de-silting chamber is reduced, thus reducing its efficiency. Also, the deposited silt may further contaminate the rainwater that enters it.
- 3) **The filtration efficiency of the filter media** – with silt deposition, the top layer of pea gravel gets choked and does not allow water to filter down into the deeper layers of gravel. As a result, the borewell is not able to take water to the aquifer. Hence it is important that the porosity of the top layer of filter media is maintained.
 - 4) **Borewell slots** – The borewell in the recharge pit has slots at two places. The first set of slots is in the recharge pit at the gravel/boulders level. These slots are for intake of cleaned rainwater from the pit. The second set of slots is deep below – at the level of the active aquifer. These slots ensure that the cleaned rainwater enters the aquifer and recharges the groundwater. Both these sets of slots have to be kept absolutely open to make sure that all the available runoff enters the borewell and through it, recharges the groundwater.

For a rainwater harvesting system to work at optimum efficiency level, all the above have to be regularly cleaned and kept obstruction free.

GENERAL OBSERVATIONS MADE DURING VISIT TO RAIN WATER HARVESTING SITES IN GURGAON

- In many places, storm Water Drains (SDW) are not used only for rainwater, but are connected to sewerage lines as well.
- In rainy season sewer water overflows into the storm water drains in many places.
- The width and depth of storm water drain are not sufficient for runoff.
- In some places, the slab of the drain is broken and due to malba the drains get choked.
- Numbers of manholes are less as per required size of the pit.
- In some structures baffle wall needs to be repaired with respect to height and depth so that water overtops from desilting pit to the main percolation pit easily.
- In some structures there is need to put more filter media.
- Many structures are covered with garbage and plants.
- In some of the structures manholes are in broken condition.
- In some places, height of the structure is lower than the surrounding area.
- In storm water drain at every 10 meters interval, manhole should be provided, so that cleaning of the drain can be done easily.
- Most of the bores are of inadequate depth and this needs to be increased, because of increase in water table.
- Some of the bores are in choked condition and without bore cap. The bore needs to be cleaned and bore cap should be repaired.

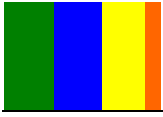


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The following tables give a list of communities and number of observations made during visit area wise

TABLE 1

S.NO.	COMMUNITY	OBSERVATION
1	Gurgaon Sector-21 (Main market)	<ul style="list-style-type: none"> Sewer water also coming to the SWD, so over flows happen Within 300 meter distance 7 no. of RWH structures are present but not working Water also comes from village, which sows extra runoff The bore depth is 330 feet with 8 inch dia cast iron pipe and bore is choked 10 inch sewer line should be increased in size and should be connected to main line Slab should be repaired Connecting SWD is in broken condition hence repairing is require Though SWD is open i.e slab is broken and covered with garbage
2	Gurgaon sector-22B (Community Center)	<ul style="list-style-type: none"> Bore is choked due to contaminated water coming to it and bore cap is not available, external matters may come to it RWH str. Rings are in broken condition- 3 to 4 no. of rings should be installed accordingly
3	Gurgaon Sector- 22B (Triangular Park)	<ul style="list-style-type: none"> There is one bore, which should be covered by an underground new RWH pit Proposed str. Should be connected from two manholes just outside the park Cleaning of existing bore is required
4	Water Tank Park(House no.-575)	<ul style="list-style-type: none"> Proposal for new RWH structure using by existed desilting chamber Existing desilting pit should be cleaned
5	Govt. high school triangular park (Moulaheera)	<ul style="list-style-type: none"> Manholes should be installed Slab of RWH str. Is in broken condition should be repaired Cleaning of the whole str. Is required Bore cap is required
6	Choudhary Devi Lal Smriti Udhaayan	<ul style="list-style-type: none"> It is very big park having larger in area needs to propose new RWH str. According to runoff generated
7	Gurgaon sector-15 (Part-2)	<ul style="list-style-type: none"> Replacement of slab is required Connecting drain should be constructed Manholes are required Proposal for big dustbin to avoid garbage



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		<ul style="list-style-type: none"> • Cleaning of whole pit required
8	Shiv Park (House no.-962)	<ul style="list-style-type: none"> • Pit needs to clean • Need for more filter media • Adjoining drain should be cleaned
9	Gurgaon Sector -15 (Part -2), Uttav park	<ul style="list-style-type: none"> • Desilting chamber should be cleaned along with adjoining drain should be connected to new proposed str. With bore
10	Sushant Lok 1	<ul style="list-style-type: none"> • Manholes required • Existing str. Should be replaced with another RWH str. Connecting SWD drain • Lower ground level is present nearby, it can be developed as water body with bore
11	Gulab park(C-block), Sushant Lok 1	<ul style="list-style-type: none"> • New manholes should be installed • Slab of RWH pit should be repaired • Cleaning of whole structure is required • Bore cap is required • Adjoining drain should be cleaned
12	South City-2	<ul style="list-style-type: none"> • In this area 5 meter dia str is present but water still retains in the structure. • Contaminated water is coming to the str • Adjoining SWD drain should be connected in a such a way there is no chance of contamination because at somewhere in SWD contaminated water line is connected • Overflow water pump out timely