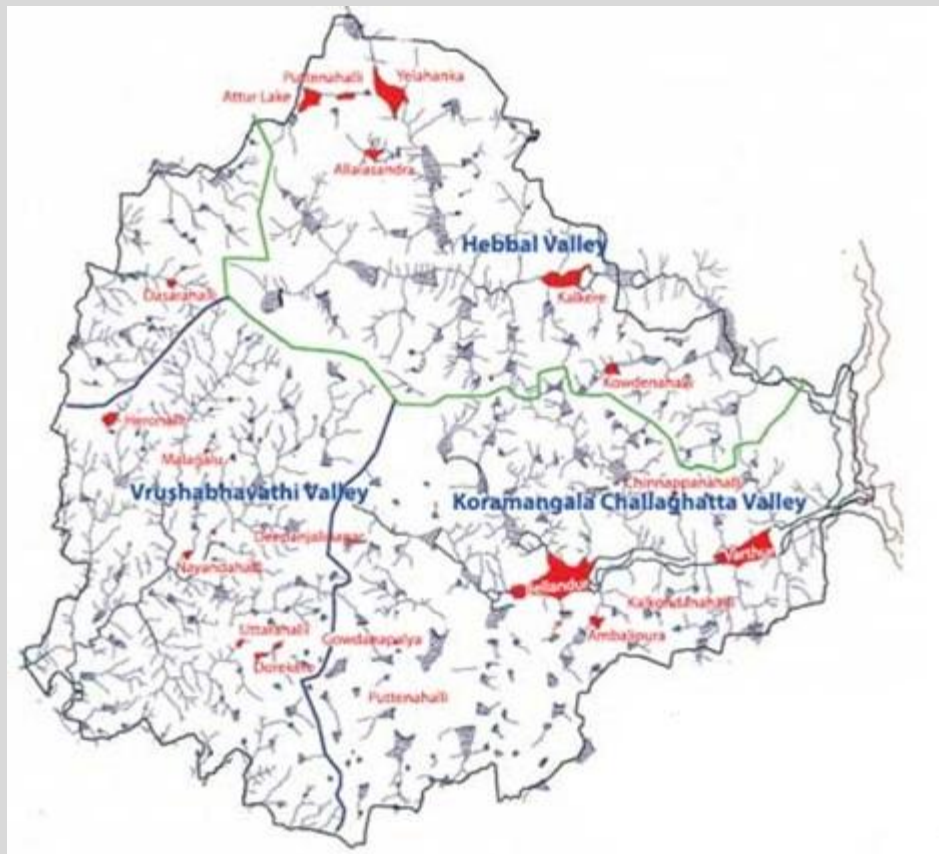


Water & Architecture



biome
Environmental



Bangalore City: Lakes

Source: <http://www.deccanherald.com/content/25285/vanishing-lakes-time-act-now.html>

Water Management

 Residence

 Institution

   Campus

       Neighbourhood

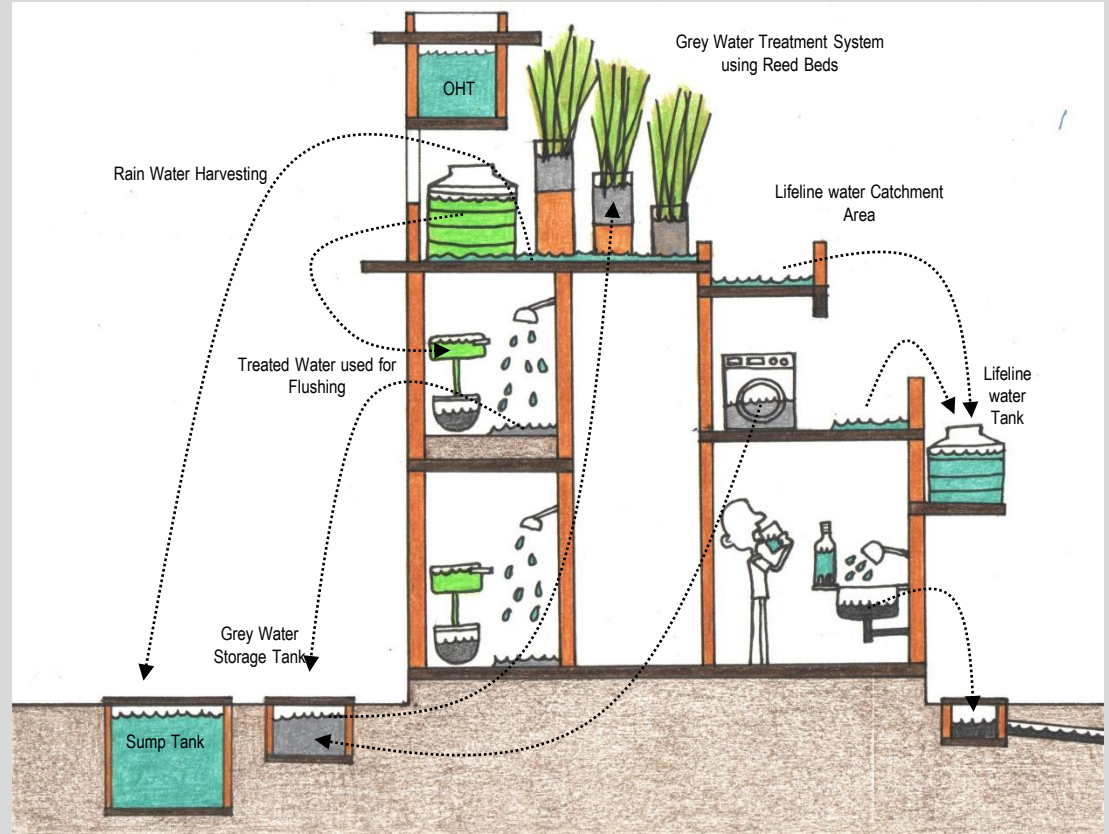
                 City

Water Management

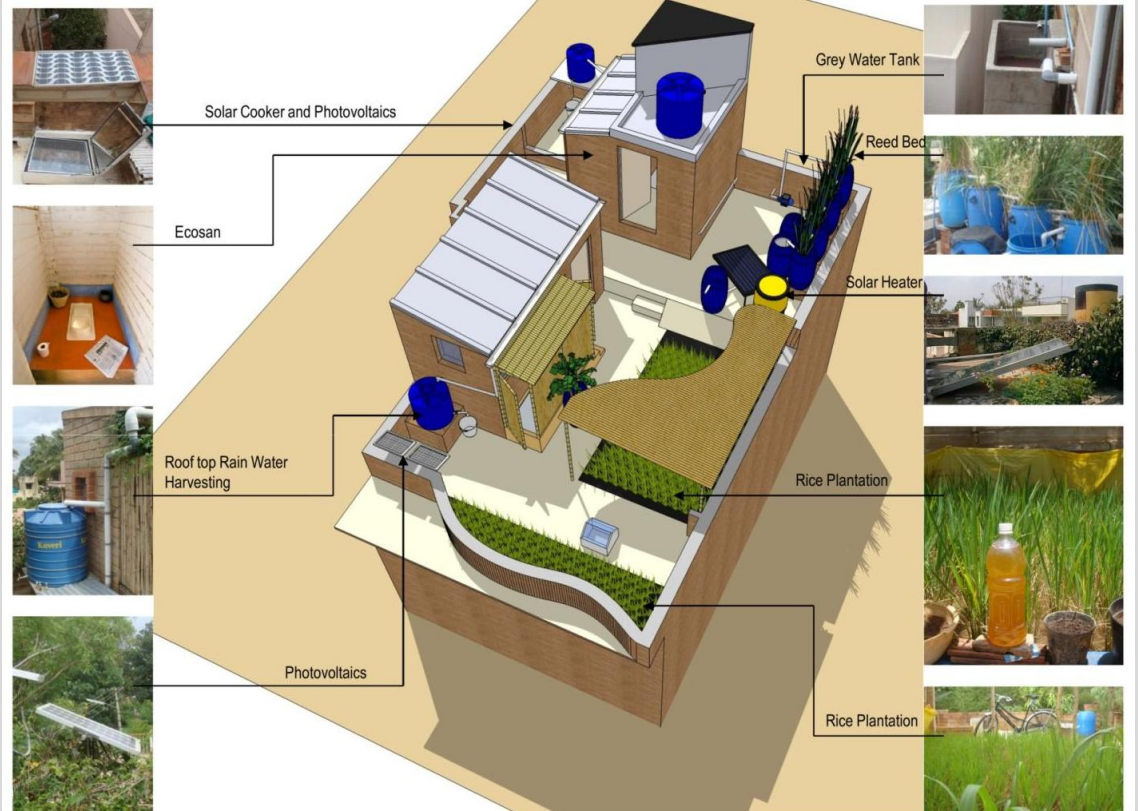
▲ Residence



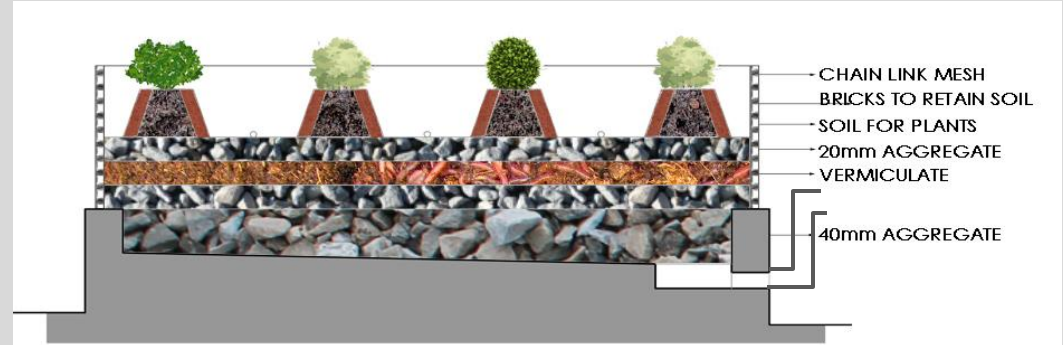
Typical Roofs in Residences



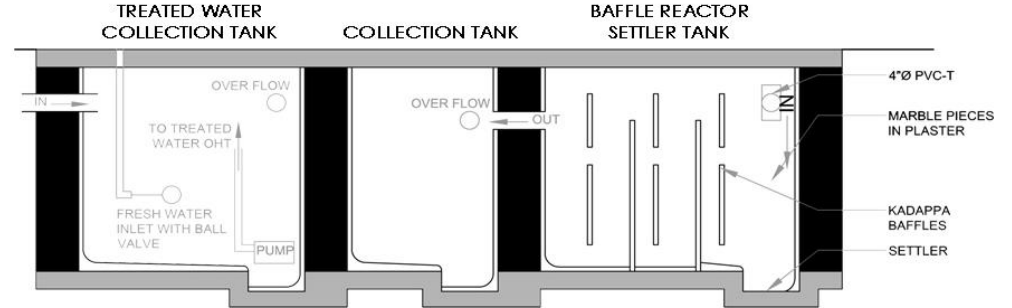
Residence for Mr. Rohan & Mrs. Reshmi Eappen



Sans Souci, Bangalore



SOIL BIO REACTOR



BAFFLE REACTOR

Residence for Mr. Sanjay & Mrs. Rekha Chary

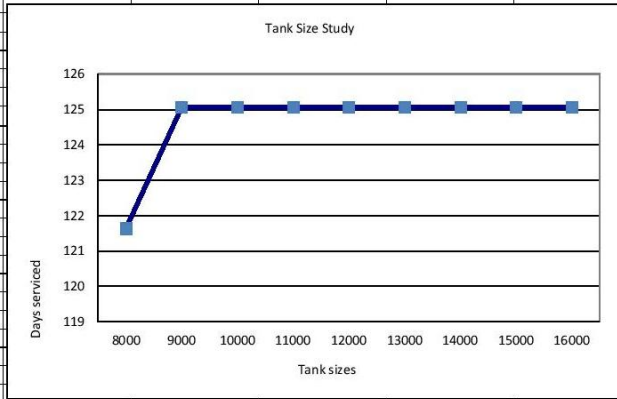


Residence for Mr. Ramadurai



Residence for Mr. Prashanth Bhatt

Tank Analysis				
Roof Area. Sqm			86	Bangalore
Daily water consumption			600	
Total harvestable water (liters)			75039.30	
Tank Size	Serviced	Water stored	Rain water used	Water for recharge
	Liters	Days	Liters	Liters
8000		122	72979	72979
9000		125	74542	74542
10000		125	75039	75039
11000		125	75039	75039
12000		125	75039	75039
13000		125	75039	75039
14000		125	75039	75039
15000		125	75039	75039
16000		125	75039	75039
The optimum size of the tank is 8000 lts.				



Sump Tank Capacity Optimization

	Units	Mini and Satheesh Residence	Mukherjee Residence	Ramadurai Residence	Uma Devi, Vidyaranyapura	Ghosh Residence	Sheeba and Vijay Residence
Plot Area	sq.m.	368.0	218.5	220.8	147.2	346.7	220.8
Plot coverage	sq.m.	104.9	132.5	116.0	75.2	87.8	127.7
No. of Occupants		6.0	4.0	4.0	4.0	3.0	3.0
Roof Area	sq.m.	104.9	132.5	143.2	63.5	62.9	91.7
Fresh Water Requirement	KL/day	295.7	197.1	197.1	197.1	147.8	147.8
Rain water Harvested	KL/yr	83.9	106.0	114.6	50.8	50.3	73.4
Grey water Treatment	Ltr/day	540.0	360.0	360.0	360.0	270.0	270.0
Grey water Treatment	KL/yr	197.1	131.4	131.4	131.4	98.6	98.6
Black Water treatment	Ltr/day	240.0	160.0	160.0	160.0	120.0	120.0
Black Water treatment	KL/yr	87.6	58.4	58.4	58.4	43.8	43.8
Fresh Water From Outside	KL/yr	124.1	32.7	24.1	87.9	53.7	30.6

Table showing Carrying Capacities of Six Residential Projects



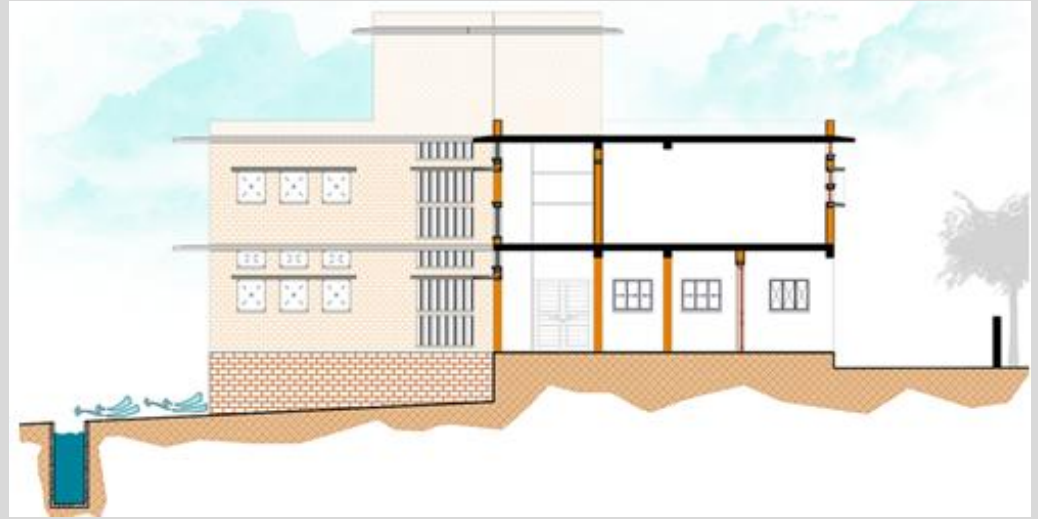
Bangalore City



Bangalore City with Smart Roofed Houses

Water Management

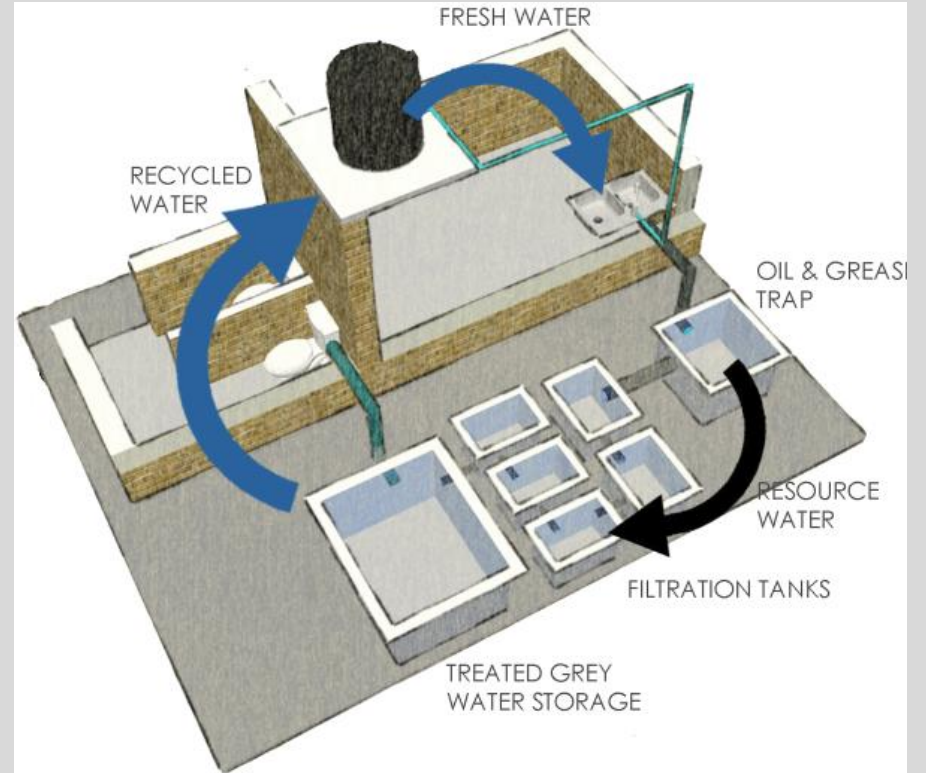
 Institution



Buddhi School, Jakkur, Bangalore



FLOOR PLAN SHOWING THE BASIC PLUMBING LINES

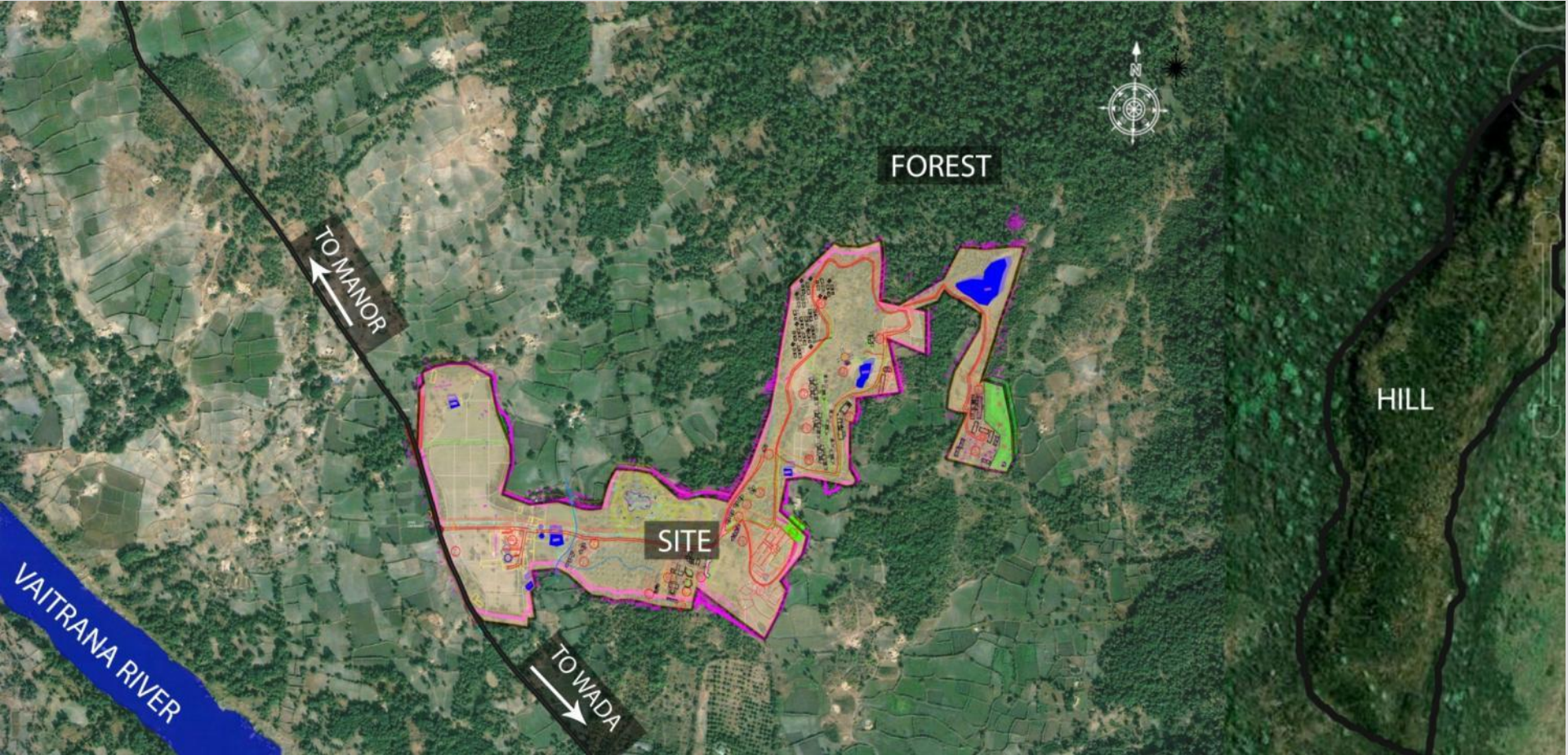


Water Management

 Campus



Govardhan Eco Village, Wada, Maharashtra



Govardhan Eco Village, Wada, Maharashtra

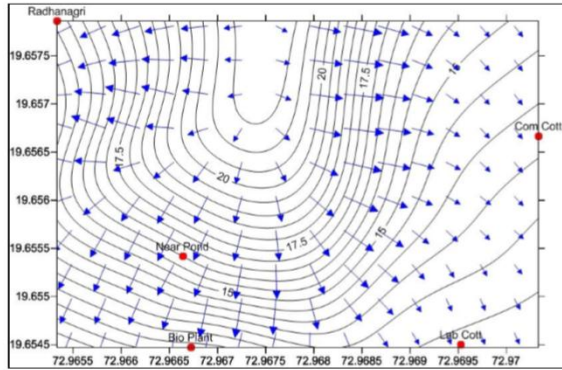


Figure 3: Water table contour map of Govardhan eco-village.

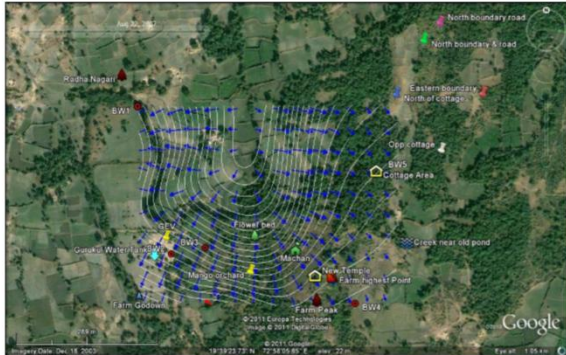


Figure 4: Water table contour map of Govardhan eco-village.

Govardhan Eco Village, Wada, Maharashtra : Hydrogeological Study

RECOMMENDATIONS

After detailed hydrogeological studies which included hydrogeological mapping, resistivity surveys, water table contouring and pumping test it is regarded that the recharge activities should also be undertaken along with measures to increase groundwater abstraction.

Measures at existing well sites

1. The shallow pond at Radhanagri near BW1 is only about 2-3 m deep. This pond can be deepened to construct a dug well about 8-10 m in depth. As there is an inflow zone at about 6 m, the well is expected to yield sufficient water to suffice for agricultural purposes at Radhanagri. Currently, the shallow pond only receives water during rains from the soil rock contact and deepening it into a dug well may tap the underlying vesicular amygdaloidal basalt VAB 2.
2. The existing dug well near BW3 beside the kitchen has a very low yield. This is due to its proximity to the fracture zone. The shallow well is about 5 m deep and mostly water infiltrating from the soil zone enters the well during rains. Deepening the well is proposed to mainly to store water. The well can be deepened to about 8 m depth for it store reasonable quantity of water.

New wells and borewells

1. A new borewell about 200 ft deep can be drilled near the labour cottage area. The borewell must be constructed to the SE of the BW4 already existing in the area. As apparent from the water table contour map, the groundwater flow is dominantly in the SE direction. The groundwater flow is out of ISKCON property; however, a new borewell can be drilled towards the SE boundary of the Govardhan eco-village. This borewell may be used for supplying water for agricultural purposes.
2. A dug well 8 to 10 m deep is also a viable option in the Labour cottage area. The dug well can be constructed to the E of the existing borewell BW4. The water from the dug well can be used for supplying water for domestic purposes.
3. Any well to the NE of the Govardhan-eco village is not a viable option that is topographically high area acting as the natural recharge zone.

Recharge Measures

1. Groundwater recharge can be planned along the fracture zone F1 as shown in Figure 8, especially to the northern part of the village. Infiltration pits can be constructed in the forest area to the northern part of the plot. These infiltration pits will store rain water briefly and enable recharge of water to the underlying aquifers.
2. Recharge dug well or borewell can also be considered in the forest area after considering the technological feasibility. The maximum depth of well can be limited to 30 m.
3. As the dyke D1 acts as a local recharge zone diverting groundwater towards the BW4. The dyke is exposed to the W of the Community cottage and can be traced along the new temple site. The dyke can also be considered for recharging groundwater. Rain water harvesting at the cottage is currently used for storing water. This can be extended for recharging through the dyke D1.
4. Rain water harvesting can also be considered at the new temple site for recharging through the dyke D1.

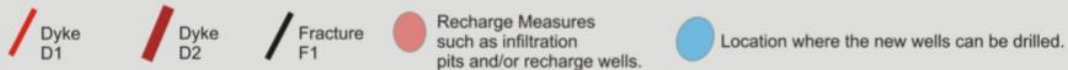
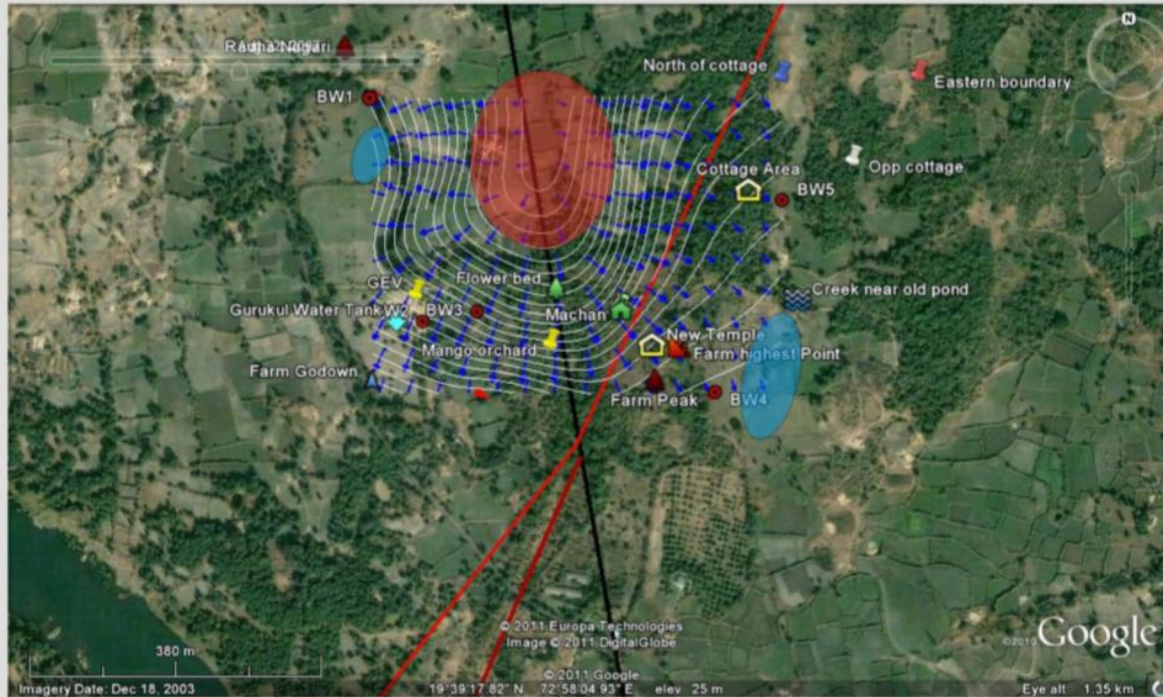
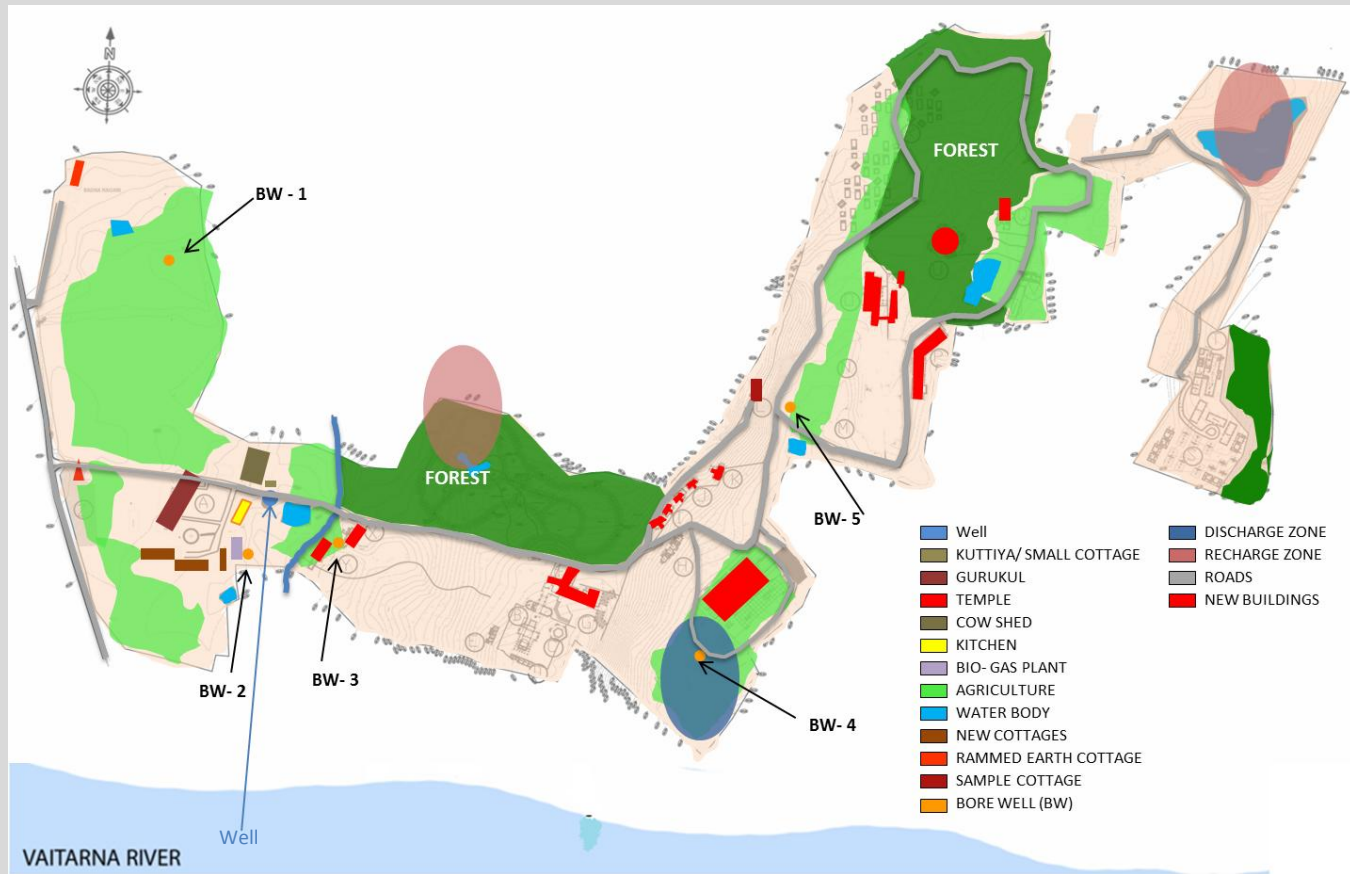


Figure 8: Satellite image showing the location for recharge measures and new wells.

Govardhan Eco Village, Wada, Maharashtra : Outcome of Hydrogeological Study



Govardhan Eco Village, Wada, Maharashtra



LOCATION: Galtare, Wada, situated
110 km North of Mumbai
CLIMATE: Hot Humid Composite
RAINFALL: 922 mm
WIND DIRECTION: East to West
SITE AREA: 63 acres

SEPTIC TANK FOR FARMERS COTTAGE

RECHARGE

WELL

SBT FOR GURUKUL

SEPTIC TANK IN SMALL COTTAGE

DEWATS FOR HOUSE KEEPING

DEWATS FOR SAMPLE COTTAGE

SBT TREATMENT



VAITARNA RIVER

DISCHARGE ZONE
RECHARGE ZONE

PLAN DEPICTING WATER TREATMENTS ADOPTED





BIO REACTOR



ORGANIC FARMING



PLANTATION & PASTURE



PLAN SHOWING THE FOREST AND AGRICULTURAL AREA



PRESERVATION & PROTECTION OF AGRICULTURAL AND FOREST LAND

GOVARDHAN ECO VILLAGE

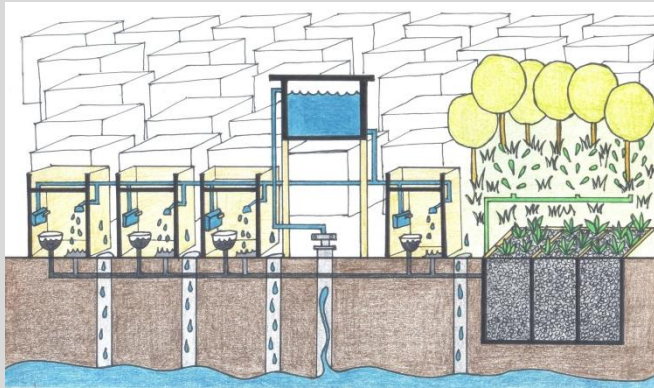
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Govardhan Eco Village, Wada, Maharashtra

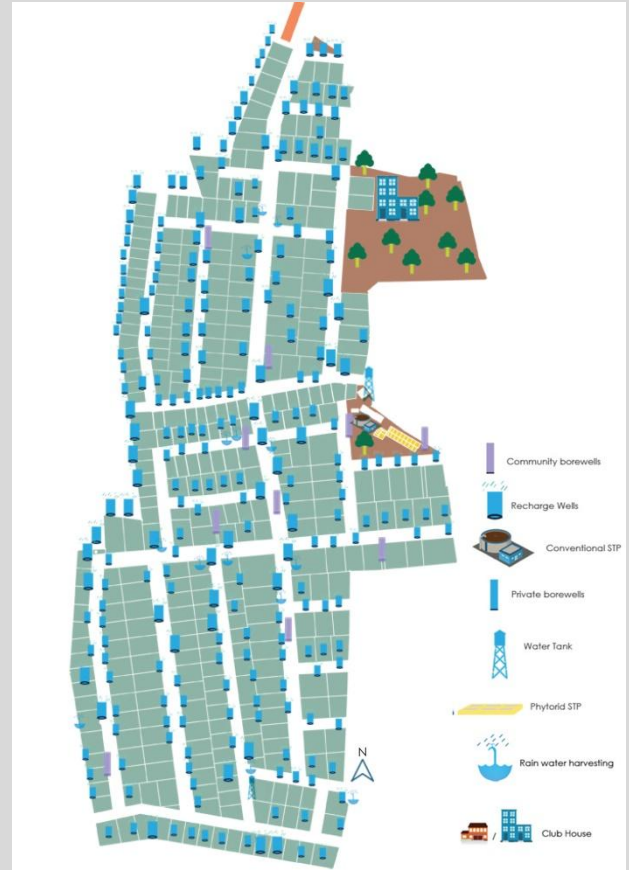


Water Management

 Neighbourhood



Rainbow Drive Layout, Bangalore





Classic Orchards Layout, Bangalore

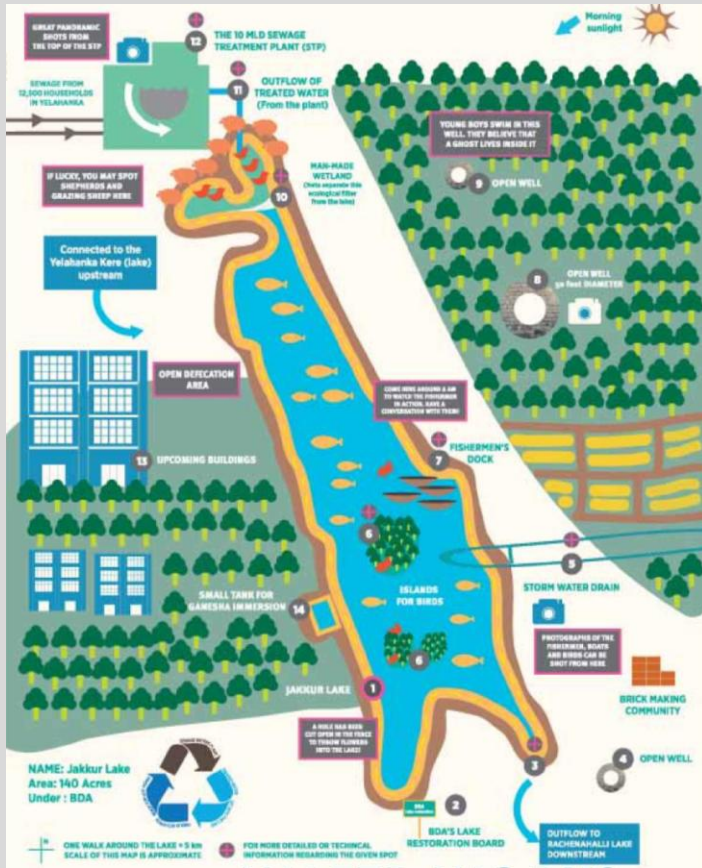
Water Management



City



Jakkur Lake, Bangalore



Jakkur Lake, Bangalore

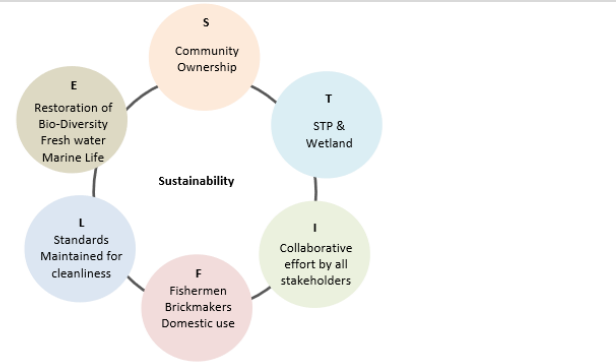


Fig 1. The STIFLE Sustainability Model for the Jakkur Lake Revival Project

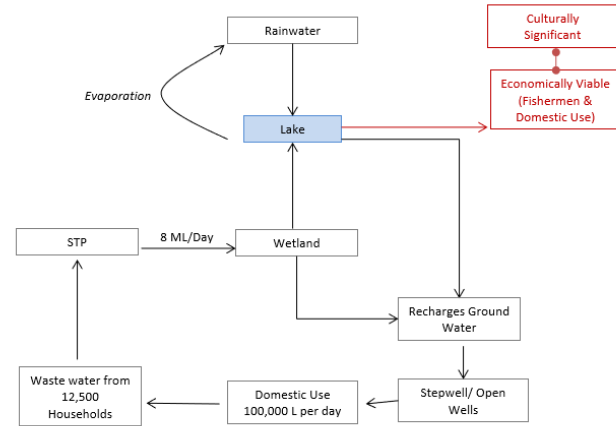


Fig 2. Diagram depicting the water cycle prevalent at Jakkur Lake.



Jakkur Lake, Bangalore



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