ADOPTING RAIN WATER HARVESTING
and
Best Practises for Effective Rain Water Management in our House

TO PROTECT WATER BODIES FOR FUTURE

Gayathri and Family, Bengaluru
Since May, 2018

- Site Dimension: 30’x40’

- While designing of our Eco-house, we have adopted rain water harvesting methods, in the design stage itself.

- Since, May 2018, we are staying in our Eco house.

- **To validate the design expectation of rain water harvesting, a one year data of our house, with respect to the volume of rain water storage, water consumption, number of days rain water used etc. has been studied and data has been generated.**

- **During the course, we have also adopted and practicing reduction methods, in consumption of water.**

WATER CONSUMPTION

As per BIS, nearly 135 to 200 Litres of water is required per capita per day (lpcd)

Requirement	Approx. Consumption per person per day, liters (lpcd)
Bathing, Wash Basin	30
Cloth washing	20
Toilet Flushing	45
Drinking	3
Wastage in purifier	8
Cooking	4
Vegetable + Groceries cleaning	5
House cleaning	7
Utensil washing	8
Other Purposes	20
Total	**150**

So, a family of 4 needs minimum 600 litres per day !

WATER CONSUMPTION PER FAMILY AS PER BIS

Requirement	Approx. Consumption per person per day, liters	For a family of 4 persons per day, litres
Bathing, Wash Basin	30	120
Cloth washing	20	80
Toilet Flushing	45	180
Drinking	3	12
wastage in purifier	8	32
Cooking	4	16
Vegetable + Groceries cleaning	5	20
House cleaning	7	28
Utensil washing	8	32
Gardening	10	40
Other Purposes	10	40
Total	**150**	**600**

WATER CONSUMPTION BY OUR FAMILY

Requirement	Our family (4 persons) consumption per day, litres
Bathing, Wash Basin	80
Cloth washing	80
Toilet Flushing	0
Drinking	12
wastage in purifier	32
Cooking	16
Vegetable + Groceries cleaning	20
House cleaning	25
Utensil washing	25
Gardening	0
Other Purposes	20
Total	**310**

Net Reduction in water consumption by our family : 600 – 310 = 290 Litres per day (48.33%)

BEST PRACTISES ADOPTED TO REDUCE THE WATER CONSUMPTION IN OUR HOUSE

To reduce the demand of water, following reduction methods were adopted

1. ***Hand showers incorporated instead of bucket filling, for bathing purpose.***

2. ***Initial cold water from the solar heater water lines, stored in buckets and used for house cleaning/mopping purpose. After cleaning/mopping, this water is used in garden.***

3. ***Adopted and practicing , use of minimum flow of water, for utensil cleaning purpose***

4. ***Use of fresh water for toilet flushing and gardening, is completely eliminated.***

5. ***Incorporated Drip Irrigation method, for watering the plants/trees, with the recycled water, in the garden.***

6. ***Toilet flush valve is set, to discharge minimum flow of recycled water.***

1. RAIN WATER HARVEST

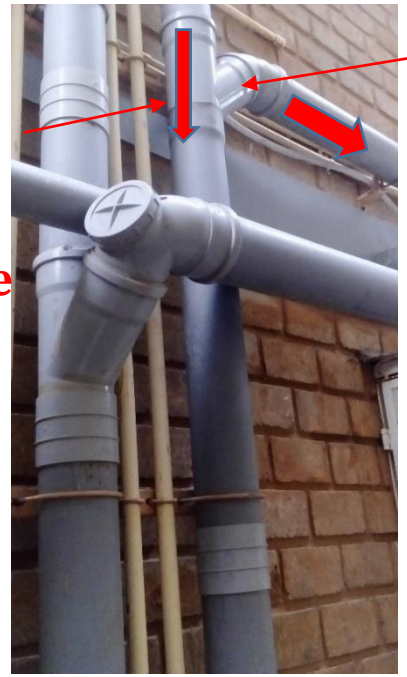
Rain water being the purest natural water, suitable underground tank constructed for its storage, through passive filtration.

- Consumption in liters per day : 310 litres
- Open terrace area availability for collecting rain water : 55.0 Sq.m
- Bengaluru's distributed and average rain fall per year : 60 rainy days and 857 mm rainfall
- Rain Water Storage Tank : 6000 litres

- ***In a year, around 42,000 liters rain water is harvested which meets requirement of our house, for nearly 136 days (37.2%) !***

METHOD OF COLLECTING RAIN WATER

Rain water from Terrace



Subsequent water raise through V Joint

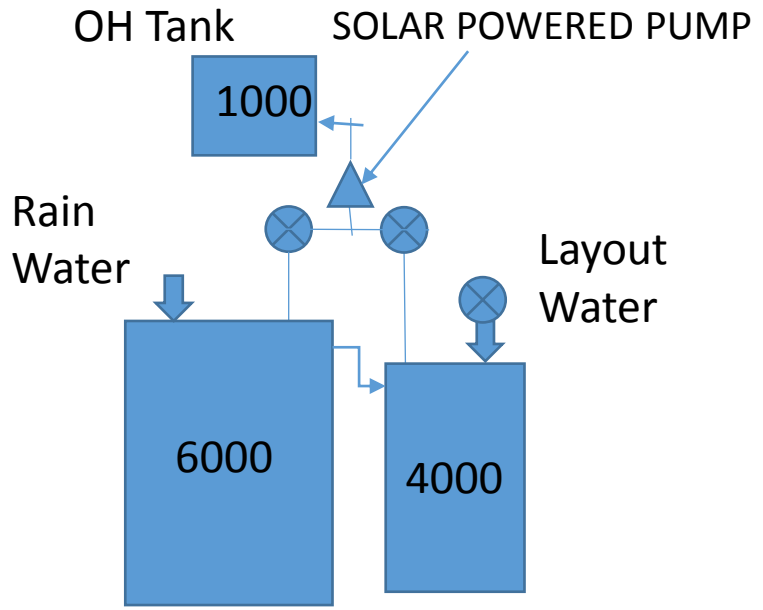
Rain water to the passive filtration unit

Passive Filtration Chamber

From filtration unit to the storage tank

Initial rain fill water / Drain

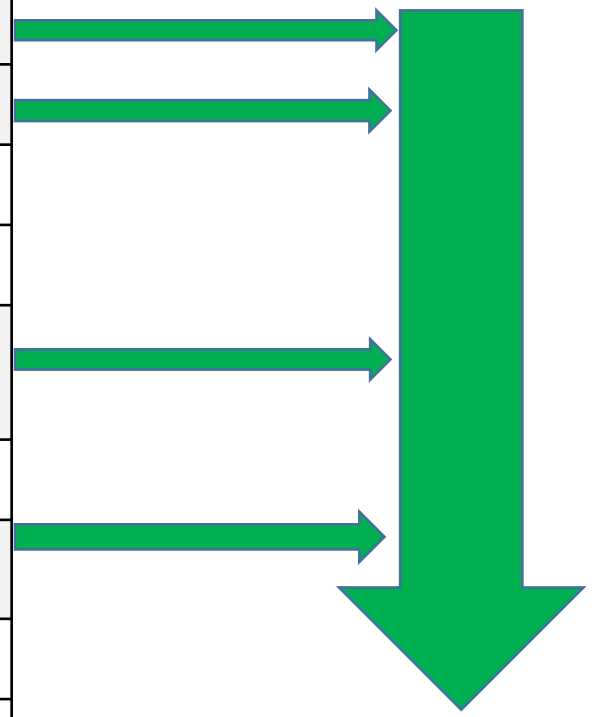
Arrangement of Water Tank



- ✓ During rain fall, the layout water tank valve will be closed.
- ✓ The excess rain water from 6000 litre tank flows out to 4000 litre tank.

Revisiting water consumption by our family

Requirement	Our family consumption per day, litres
Bathing, Wash Basin	**80**
Cloth washing	**80**
Toilet Flushing	**0**
Drinking	**12**
wastage in water purifier	**32**
Cooking	**16**
Vegetable + Groceries cleaning	**20**
House cleaning	**25**
Utensil washing	**25**
Gardening	**0**
Other Purposes	**20**
Total	**310**

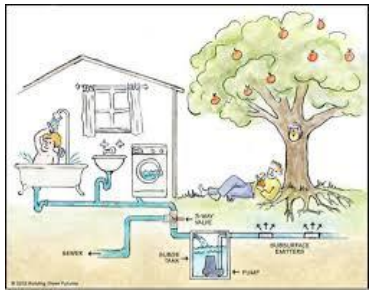


212 Litres !!

(68% of total requirement of our house)

Why to Waste this precious amount of water ? Can it be reused?

2. RECYCLING OF USED WATER



Bathing, wash basin — 80 L

Washing machine — 80 L

Kitchen vegetable/Groceries cleaning water — 20 L

Water Purifier waste — 32 L

212 L

GREY WATER STORAGE TANK (400 Litres)

WATER PUMP

SOLAR POWER

Water after first use diverted for reuse before letting it out !

Gravels and Plant Greed → Pebbles and Plant greed → Pebbles and Plant greed → Pebbles + Charcoal → STORAGE TANK (500 Litres)

PASSIVE, WATER RECYCLING UNIT

Toilet Flushing + Garden Plant/Trees

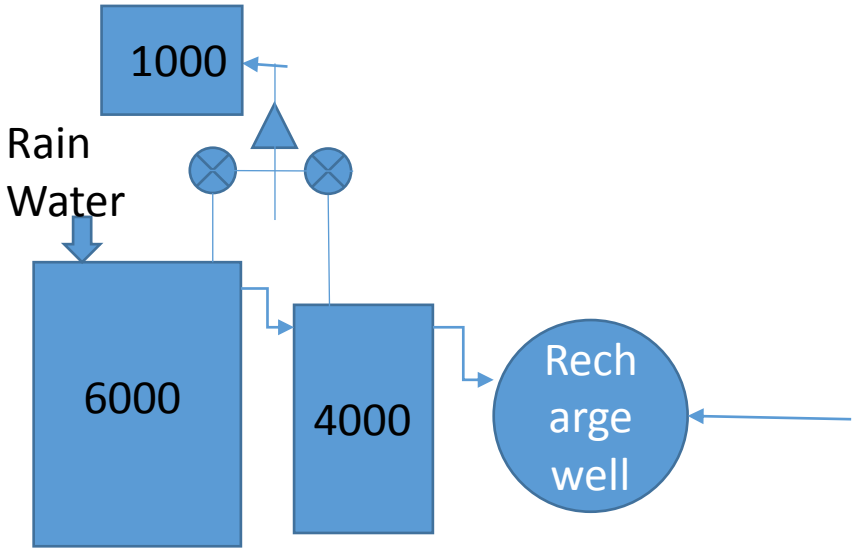
The used water of the kitchen, washing machine, bathing is recycled with passive filtration for feeding to the plants / garden and for toilet flushing. Thereby the water demand is reduced drastically and effectively the available water is consumed.

3. RECHARGE WELL

Why to waste extra rain water.....

Let it percolate inside earth....

Zero waste of precious water



Any overflow of rain water **from the water storage tank and also** ***the water falling within the site area,*** **is diverted to a recharge well, for percolation, inside the earth.**

Recharge well

Rain Water Management in our house

Consumption in Litres for	Fresh Water	Recycled Water
Bathing and wash basin	80	0
Cloth Washing	80	0
Cooking	16	0
Vegetable + Groceries Cleaning	20	0
Drinking	12	0
House Cleaning	25	0
Utensil Cleaning	25	0
Other Purpose	20	0
Wastage in purifier	32	0
Toilet Flushing	**0**	**100**
Gardening	**0**	**80**
Total	**310**	**180**

- ✓ **Saving of Fresh water per day: 180 Litres**
- ✓ **For 136 days of rain water use:**
  136 x 180 = 24,480 Litres
- ✓
- ✓ **(24,480 / 310= 79 days of water requirement of our family)**

❖ ***Effectively, 136 + 79 = 215 days in a year, we use rain water…… (58.90%) dependency on the rain with only 6,000 litres tank…***

To Summarise……Water management in our house

- As per BIS standard, family of 4 needs 2,19,000 litres per year
- Our family Consumption is 1,13,150 litres per year

48.33 % reduction in water demand

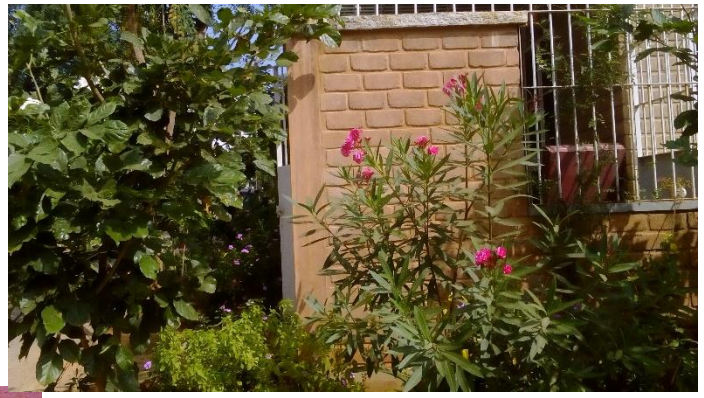
- By effective utilization of fresh water and recycling the used water, we increased the rain water usage from 136 days to 215 days.

Further reduction, of water demand from 48.33 %……to…….. 58.9 %

So, 58.90% depend on rain water and thereby equivalent reduction in Water Demand !

Trees and Plants grown around the house, using recycled water and Biogas slurry











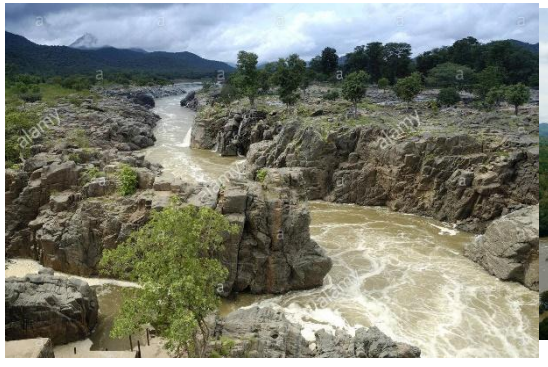

Contribution and its benefit……..

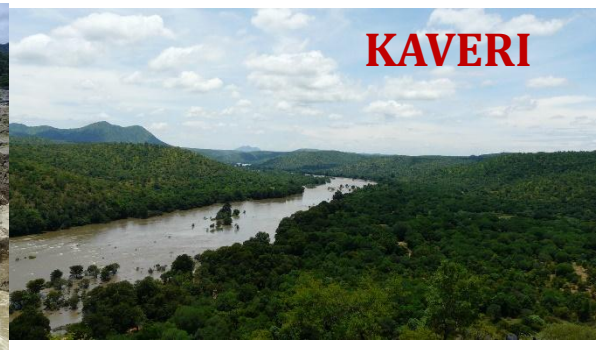
- ***We are satisfied that by adopting simple possible methods, we are able to effectively utilize the precious water, thereby contributing towards protecting and sustaining the water bodies, for future***
- ***If Every House adopts this simple techniques of rain water harvesting and its management, the demand for water, can be reduced drastically (by minimum 58.9 %). This is a big relief to the water bodies and to the environment.***

We opine the following can be considered to protect the precious water bodies…

- **Water management can be decentralized to local areas for effective utilization of available rain water, in that area itself. This Saves water transport expenses.**
- **Natural Water Resources can be sustained for longer time.**
- **“ River Diversion OR Mega Expensive Water Project” of bringing water from far away places, may not be required.**

Let us allow river to flow ……in its natural way….. at its wish !!!





THANK YOU