

**ashirvad**

by aliaxis

# RAINWATER HARVESTING SYSTEM



From the house of  
Ashirvad RainBank system  
**EasyFlow Filter**



# Water is life

Water is life but with growing industrialization & urbanization water availability is becoming scarce in many cities and towns as the water table levels are depleting, river and ponds are vanishing. It is important to know that only 3% of the earth's water is freshwater out of which 2.5% is locked up in glaciers and is not available, only 0.5% is available as freshwater. Hence, we need to follow innovative practices for conserving water for today and try to increase ground water table and secure our water requirements for our future.

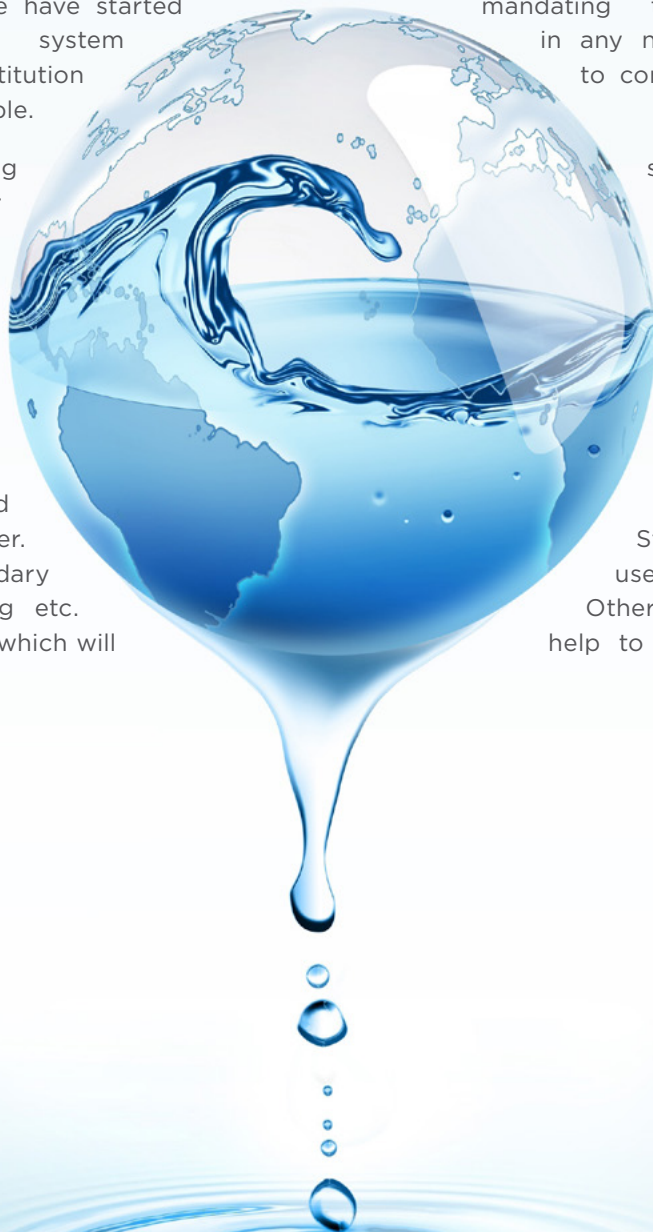
Rainwater is available in plenty but usually it is not conserved. Rainwater harvesting is a technique in which the rainwater percolates through the open ground down into the water table which would help in improving the availability of water. It requires minimal efforts by people to practice rainwater harvesting at their individual houses and large commercial establishments.

## Why Rainwater Harvesting System?

Growing urbanization, industrialization, irrigation, etc. has led to overutilization of potable water leading to water scarcity in main cities and towns. Understanding the situation, the government, both central and state have started rainwater harvesting system in any new house, buildings, industries and other institution and depleting water table. mandating the installation of to combat the water crisis

Rainwater harvesting to maintain the water and improve the Rainwater harvesting conservation and

Rainwater harvesting of collecting the storing it for the future allowing them to run collected from roof and well / borewell / aquifer. used for various secondary irrigation, car cleaning etc. be directed to ground which will water level.



system would help table underground water availability. is a step toward water sustainability.

system is a process rainwater and use, rather than off. Rainwater can be directed to a tank / Stored water can be use like gardening, Other than storing it can help to improve the ground

# Introducing Ashirvad RainBank: A Complete Rainwater Harvesting System

For past two decades, Ashirvad has always been providing sustainable innovative solutions for its customers. In a constant endeavour to make our customer's life easy, Ashirvad brings to you "Ashirvad RainBank".

Ashirvad, India's leading Smart Water Solution provider, with its superior and engineering capabilities has come with One- Stop-Solution for rainwater harvesting system and helping society in water conservation.

## Components of Ashirvad RainBank System:

- Channelization - SWR down take pipes and fittings
- Filtration - EasyFlow filter
- Borewell recharge - Casing pipes



## Benefits:

1. Helps to reduce the water bill and decrease dependency on water tanks.
2. Property tax benefit from municipal corporation if rainwater harvesting system is installed (Tax benefit and applicability will vary by location, for details check with your local municipal body).
3. Rainwater can be stored and used for secondary purposes like gardening, flushing of toilets, car cleaning, floor mopping etc.
4. Improves the water level table of groundwater.
5. RainBank system is easy to install and operate.
6. It helps in reducing soil erosion, stormwater runoff, flooding and pollution of surface water with fertilizers, pesticides, metals and other sediments.

## Channelization - SWR down take pipes and fittings

Ashirvad offers an industry leading range of Solvent-fit and Push-fit Soil, Waste and Rainwater Plumbing System. These systems offer unparalleled installation options with high quality finish, superior dimensional accuracy, stability and are suitable for all commercial and domestic installations.



Quick, easy and convenient installation



Corrosion and abrasion resistance



Smooth Interior surface



Tough and reliable



Cost effective

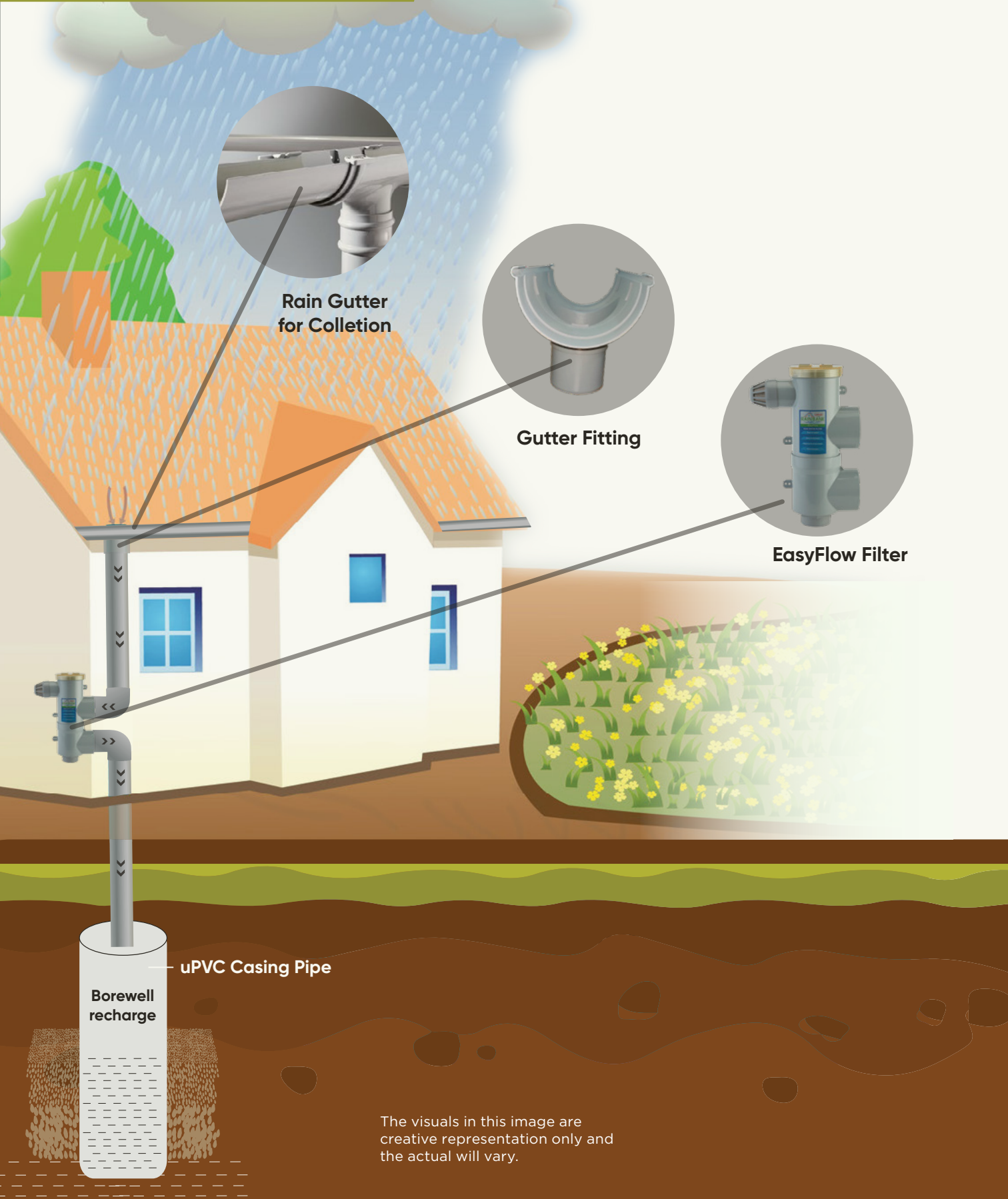


100% leak proof joints



# Types of installation

## TYPE 1: SLANT ROOF

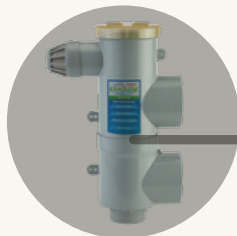


The visuals in this image are creative representation only and the actual will vary.

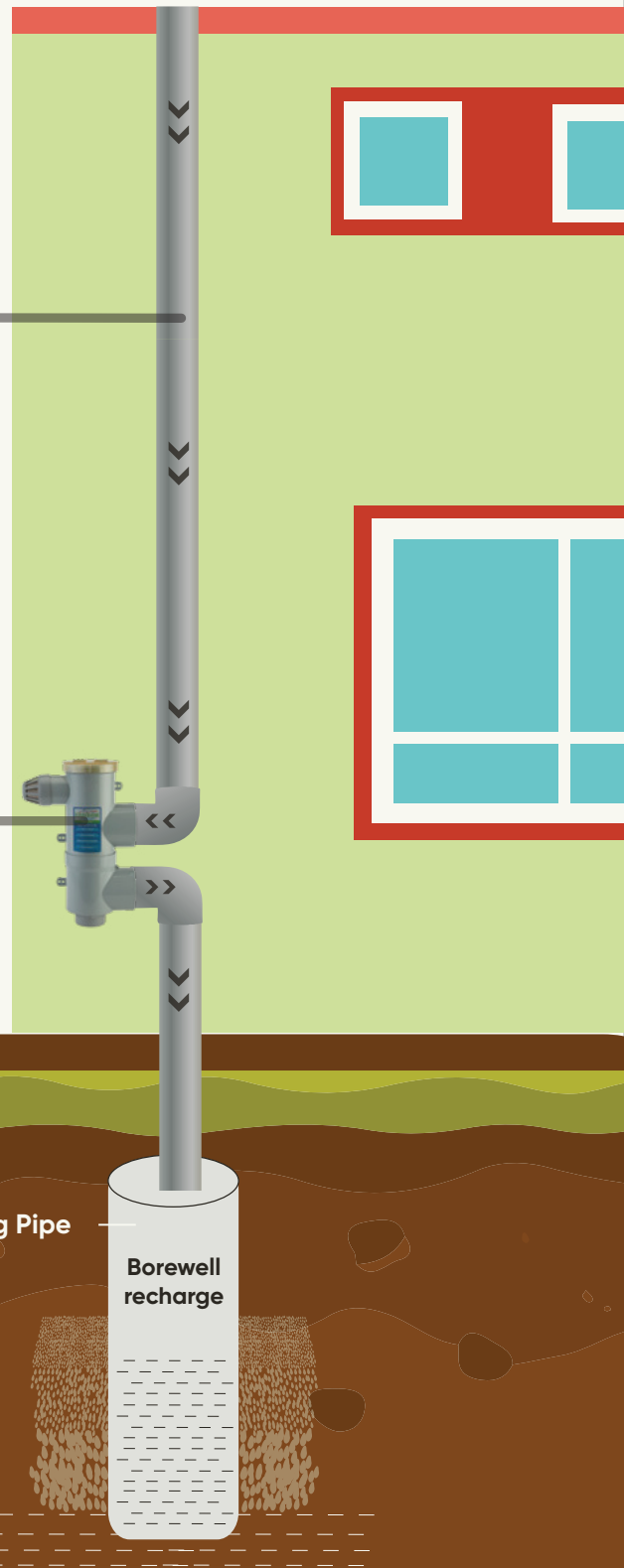
## TYPE 2: FLAT ROOF



**SWR pipe for  
Channelizing water**



**EasyFlow Filter**



**uPVC Casing Pipe**

**Borewell  
recharge**

The visuals in this image are creative representation only and the actual will vary.

## Filtration - EasyFlow filter

In continuation of Ashirvad's endeavor to provide solution which solves customers' pain point and create environmental sustainability, Ashirvad has introduced EasyFlow filter in the RainBank system. EasyFlow filter will help in removing the dirt, debris etc. from the rainwater before it goes to sump for storage or borewell recharge or recharge pit.

### Benefits:

- **In-Built clamping:** Ashirvad EasyFlow comes with in-built clamping which helps installer for easy installation and better grip at the strategic points for longer stability at any pressure of workflow.
- **Easy to maintain:** Transparent cap at the top and easily accessible mesh for maintenance.
- **By-Pass line:** Provided with a bypass line to avoid roof flooding. In case the filter is clogged, water will divert to the bypass line.
- **Filtration:** Inner mesh is 250 microns which ensures the fine filtration of rainwater making it suitable for all secondary purpose usage.



EasyFlow Filter

## Borewell recharge:

### Screen (filter) Casing pipes

Ashirvad uPVC blue Casing and Screen pipes are manufactured as per IS 12818:2010 standard and available from 40mm to 250mm sizes.

These pipes are an ideal product for protection of domestic, irrigation, industrial and mining borewells, keeping out the gravel pack and foreign particles providing clean and clear water from the borewells.

### Benefits:

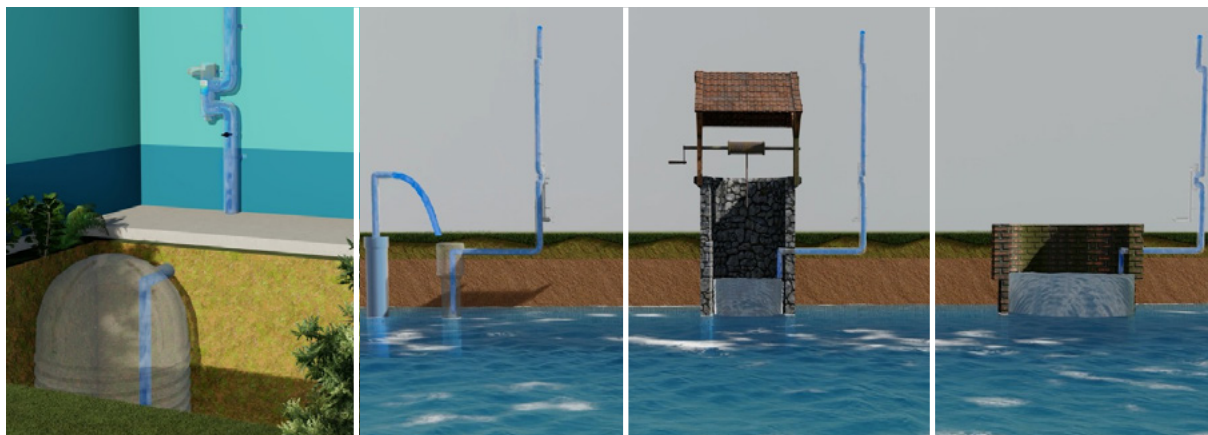
- Very effective way to recharge and improve the ground water level.
- To conserve the surface water runoff during monsoon.
- Main sewer can be protected from flooding during monsoon by reduced volume of discharge of rainwater.
- Slot width right from 0.2mm to 3.00mm can be provided.  
(0.2, 0.3, 0.5, 0.75, 1.0, 1.5, 2.0, 3.0)



Screen Casing Pipes

## Applications of EasyFlow filtered rainwater

- Store the filtered rainwater in the sump / tank for secondary usage purpose.
- Recharging the borewell
- Recharging open well by discharging filtered rainwater in the well
- Recharging groundwater by discharging filtered rainwater in the recharge pit



Storage for Secondary Usage

Borewell Recharge

Dug well Recharge

Recharge Pit

## Selection of rainwater pipe for roof drainage

The roof drainage outlets and rainwater down take pipes are calculated based on the calculation given by Indian national building code.

### Sizing of Rainwater Pipes for Roof Drainage in mm/hr

(Clause 4.5.11.6.8)

SL No.	Dia of Pipe mm	Roof Area. in m2 for Average Rate of Rainfall in mm/hr					
		50	75	100	125	150	200
(1)	(2)	(3)	(3)	(3)	(3)	(3)	(3)
i)	50	29.70	19.80	14.85	11.88	9.90	7.42
ii)	65	57.23	38.15	28.61	22.89	19.08	14.31
iii)	75	81.84	54.56	40.92	32.74	27.28	20.46
iv)	100	168.00	112.00	84.00	67.20	56.00	42.00
v)	125	293.48	195.66	146.74	117.39	97.83	73.37
vi)	150	462.95	308.64	231.48	185.18	154.32	115.74

NOTE: For rainwater pipes of other materials, the roof areas shall be multiplied by (0.013 / coefficient of roughness of surface of that material). For example, for rainwater pipes of PVC (coefficient of roughness = 0.009). the above values of roof area shall be multiplied by 0.013/0.009 = 1.44.



# Annual rainwater availability calculation

The total volume of rainwater available from any roof top surface is a product of total rainfall and the surface area of collection. A runoff coefficient is usually applied to account for infiltration, evaporation and other losses and it varies from 0.8 to 0.95. In order to estimate the average annual/monsoon runoff from rooftop area in any location, the average annual monsoon rainfall data for the location need to be used and using Tables 1 and 2, the water availability for flat and sloping roof can be worked out.

**Table 1 - Water availability for flat roof areas**

SI No.	Roof top Area M <sup>2</sup>	Rainfall. mm												
		100	200	300	400	500	600	800	1000	1200	1400	1600	1800	2000
		Water Availability (m <sup>3</sup> )												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
i.	20	1.6	3.2	4.8	6.4	8	9.6	12.8	16	19.2	22.4	25.6	28.8	32
ii.	30	2.4	4.8	7.2	9.6	12	14.4	19.2	24	28.8	33.6	38.4	43.2	48
iii.	40	3.2	6.4	9.6	12.8	16	19.2	25.6	32	38.4	44.8	51.2	57.6	64
iv.	50	4	8	12	16	20	24	32	40	48	56	64	72	80
v.	60	4.8	9.6	14.4	19.2	24	28.8	38.4	48	57.6	67.2	76.8	86.4	96
vi.	70	5.6	11.2	16.8	22.4	28	33.6	44.8	56	67.2	78.4	89.6	100.8	112
vii.	80	6.4	12.8	19.2	25.6	32	38.4	51.2	64	76.8	89.6	100.8	115.2	128
viii.	90	7.2	14.4	21.6	28.8	36	43.2	57.6	72	86.4	110.8	115.2	129.6	144
ix.	100	8	16	24	32	40	48	64	80	96	112	128	144	160
x.	150	12	24	36	48	60	72	96	120	144	168	192	216	240
xi.	200	16	32	48	64	80	96	128	160	192	224	256	288	320
xii.	250	20	40	60	80	100	120	160	200	240	280	320	360	400
xiii.	300	24	48	72	96	120	144	192	240	288	336	384	432	480
xiv.	400	32	64	96	128	160	192	256	320	384	448	512	576	640
xv.	500	40	80	120	160	200	240	320	400	480	560	640	720	800
xvi.	1000	80	160	240	320	400	480	640	800	960	1120	1280	1440	1600
xvii.	2000	160	320	480	640	800	960	1280	1600	1920	2240	2560	2880	3200
xviii.	3000	240	480	720	960	1200	1440	1920	2400	2880	3360	3840	4320	4800

**Table 2 - Water availability for slant roof areas**

SI No.	Roof top Area M <sup>2</sup>	Rainfall. mm												
		100	200	300	400	500	600	800	1000	1200	1400	1600	1800	2000
		Water Availability (m <sup>3</sup> )												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
i.	20	1.9	3.8	5.7	7.6	9.5	11.4	15.2	19	22.8	26.6	30.4	34.2	38
ii.	30	2.9	5.7	8.6	11.4	14.3	17.1	22.8	28.5	34.2	39.9	45.6	51.3	57
iii.	40	3.8	7.6	11.4	15.2	19	22.8	30.4	38	45.6	53.2	60.8	68.4	76
iv.	50	4.8	9.5	14.3	19	23.8	28.5	38	47.5	57	66.5	76	85.5	95
v.	60	5.7	11.4	17.1	22.8	28.5	34.2	45.6	57	68.4	79.8	91.2	102.6	114
vi.	70	6.7	13.3	20.0	26.6	33.3	39.9	53.2	66.5	79.8	93.1	106.4	119.7	133
vii.	80	7.6	15.2	22.8	30.4	38	45.6	60.8	76	91.2	106.4	121.6	136.8	152
viii.	90	8.6	17.1	25.7	34.2	42.8	51.3	68.4	85.5	102.6	119.7	136.8	153.9	171
ix.	100	9.5	19	28.5	38	47.5	57	76	95	114	133	152	171	190
x.	150	14.3	28.5	42.8	57	71.3	85.5	114	142.5	171	199.5	228	256.5	285
xi.	200	19	38	57	76	95	114	152	190	228	266	304	342	380
xii.	250	23.8	47.5	71.3	95	118.8	142.5	190	237.5	285	332.5	380	427.5	475
xiii.	300	28.5	57	85.5	114	142.5	171	228	285	342	399	456	513	570
xiv.	400	38	76	114	152	190	228	304	380	456	532	608	684	760
xv.	500	47.5	95	143	190	237.5	285	380	475	570	665	760	855	950
xvi.	1000	95	190	285	380	475	570	760	950	1140	1330	1520	1710	1900
xvii.	2000	190	380	570	760	950	1140	1520	1900	2280	2660	3040	3420	3800
xviii.	3000	285	570	855	1140	1425	1710	2280	2850	3420	3990	4560	5130	5700

## Your financial benefit

Rainwater harvesting system is a one time investment, but you will be reaping the benefit for long time. Apart from the financial benefit you are also contributing to the environmental sustainability with rainwater harvesting system. With typical rainwater harvesting system you can recover your investment in around 5 years. Here we show an example of a house in Bangalore with rainwater harvesting system using the rainwater to store for secondary usage.

### Example to demonstrate the return on investment :

Roof area of house: 100 sqmt / 1076.39 sqft

Average annual rainfall in Bangalore: 970mm

Storage tank capacity: 1500 ltr

Runoff coefficient: 0.85

Per unit rate of storage tank: 16 ₹/ltr

Pipe channelization: ₹ 1600 (considered cost for G+1 installation)

Per water tanker rate: ₹ 500

Per unit rate of filter: ₹ 4000

Capacity of the tanker: 6500 ltr

Filter efficiency: 0.9 (90%)



Total rainwater potential = Roof area x Average annual rainfall x Runoff coefficient

= 82.45 cu.mtr or 82450 ltr/yr

No. of tanker water saved = 82450 / 6500 = 12.68 (around 13 water tankers per year)

Tanker cost saved (for 13 water tankers) @ ₹ 500/tanker = ₹ 6500

Total investment including sump of 1500 ltr = ₹ 29600

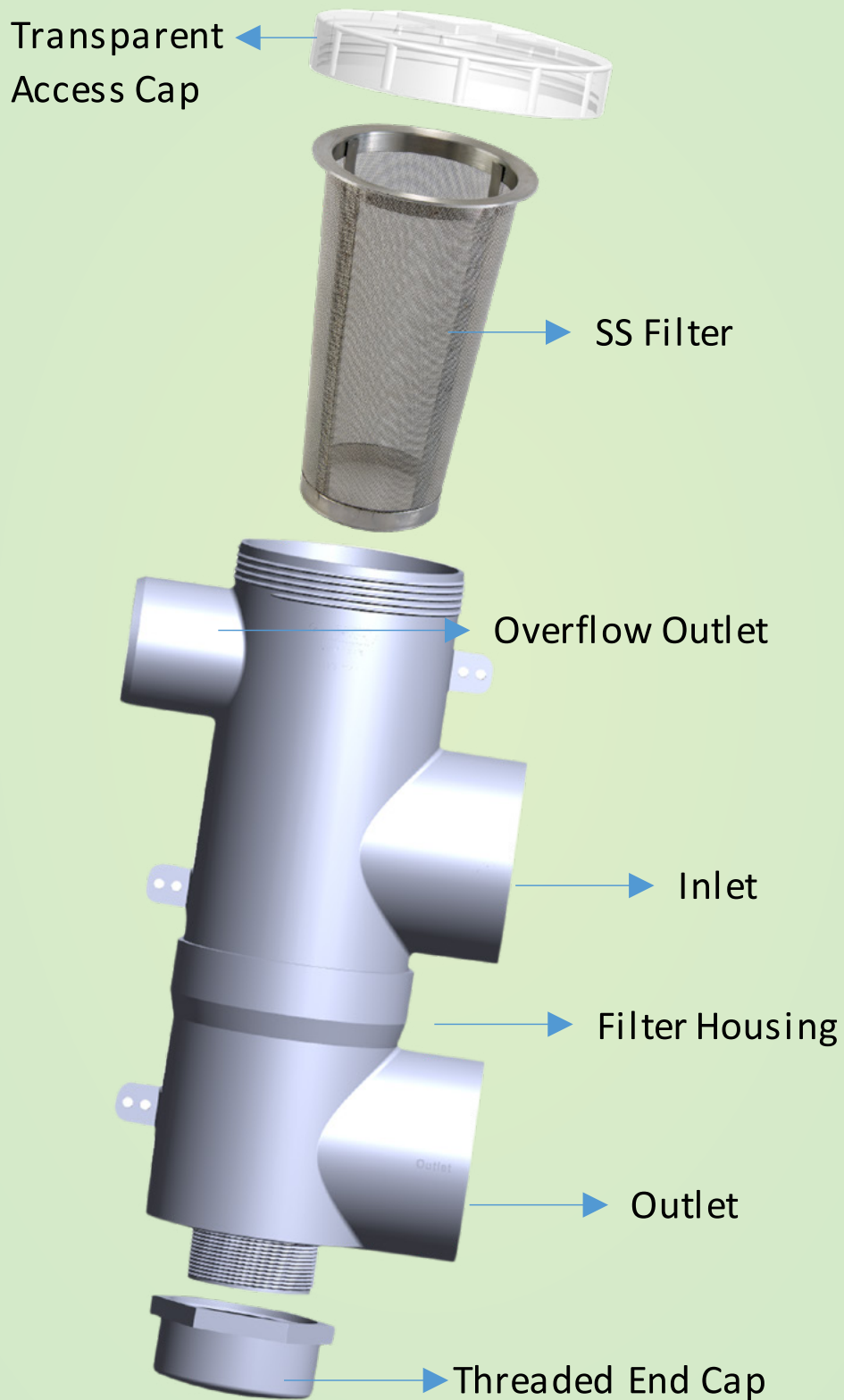
Years to recover one-time investment = 4.6 years

**After 5 years customer can save ₹ 6500 / year**

## Specifications of Ashirvad Rainbank EasyFlow filter

ITEM	SPECIFICATION
Filter Media	SS 304 Screen
Filter Mesh Size	250 Microns
Rainwater Inlet	110 mm
Rainwater Outlet	110 mm
Drain Outlet	75 mm
Overflow	75 mm
Housing	PVC
Source of Power	Gravity
Capacity	500 LPM at 2m/s velocity

## EasyFlow filter exploded view





**ashirvad**

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