



ROOFTOP RAINWATER HARVESTING FOR TACKLING FLUORIDE CONTAMINATED GROUND WATER

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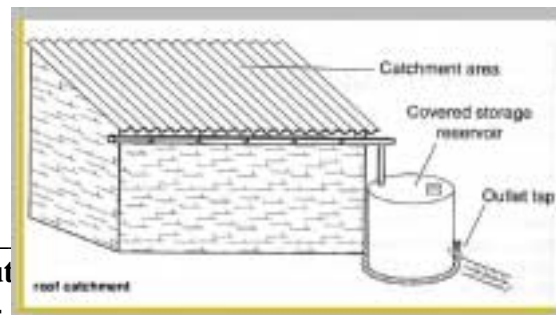
According to the Medium term fiscal plan document of the Rural Development and Panchayati Raj department of the Govt. of Karnataka nearly 5839 rural habitations in Karnataka have fluoride in excess of permissible limits in their groundwater, the only source of drinking water. Various strategies are being worked out for fluoride mitigation including identifying surface sources and drawing water from them, providing de-fluoridation units at habitation levels as well as household level, de-silting tanks and recharging ground water to dilute fluoride levels in the aquifer.



One important strategy which could provide adequate quality water for drinking and cooking purpose could be through rainwater harvesting. Rainwater is the primary source for all water and is one of the purest forms of water without any fluoride. Harvesting rooftop rainwater and using it for drinking and cooking would ensure clean potable fluoride free water for consumption.

Demand : First let us look at demand for water. Fluoride free water is needed only for drinking and cooking. Fluoride water could be used for other purposes such as bathing etc without any problem. Whereas the standards adopted by the Govt. of India for rural areas is 40 litres per capita per day the Government of Karnataka in its State Water Policy has set itself the target of 55 litres per person per day. Not all this water is however for drinking and cooking. It is reasonable to assume the requirement of 2 litres per person per day for **drinking** and about 10 litres per family for **cooking** ragi, rice, dal , vegetables etc. An average family of 5 would require about 20 litres per day for consumption and in a year this would translate to about 7300 litres. In Fluoride affected areas providing this 7300 litres would be crucial for the family .The remaining water requirement for example for bathing or washing clothes are not particularly required to be fluoride free.

Supply: Then look at supply. What about the rooftop of this house as a source of fresh water? A small ASHRAYA house has a roof area of 20 square metres. With a yearly rainfall of 500 mm the rooftop of the



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house has 10,000 litres of water incident on it . Easily 80% of this can be harvested, providing for 8000 litres per family . This is fluoride free water enough and more for their potable requirement for a year.



Rooftop rainwater harvesting: What does the process involve? The process of rooftop rainwater harvesting would mean keeping the roof clean, collecting the water through gutters or down-pipes, filtering the water to remove silt and other sediments and storing the water for later use. Excepting thatch roofs all other roofs such as Mangalore tiles, country tiles, RCC, Asbestos, G.I sheet roof are ideal for collection .

If the roof is a sloping one, then appropriate gutters can be made to collect the rainwater. This collected rainwater needs to be filtered of leaves first and then for finer sediments through a sand filter. It then needs to be stored in a closed container. This container can be a brick masonry tank, a HDPE/PVC tank, a sheet metal tank or a ferro-cement tank.

Water free from organic contaminants and kept away from air and sunlight can be kept for a long time without it getting 'spoil'.

Cost: Storage is the single largest cost component in a rooftop rainwater harvesting system. Ferrocement tanks are the cheapest and can cost as low as Rs 1.20 /- a litre. A 6000 litre storage tank- enough to last 10 months of no rain- should cost about Rs 7200/- and a gutter could cost about Rs 500/-. A filter cost is estimated as Rs 500/- and overall cost for the system could be about Rs 9000/- to Rs 10,000/-. There is however no maintenance cost involved.



**Pottery storage (MOTKA) for rainwater
Bangladesh**

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Examples: Bangladesh has launched a massive programme to build rooftop rainwater harvesting structures to provide arsenic free water for villages. Kenya, Uganda and Tanzania have large rooftop rainwater harvesting installations built mainly by women themselves in its villages.



Ferrocement tank storage- Bangladesh



Metal sheet storage with own catchment

Closer home Maharashtra, Tamil Nadu and Kerala have large rooftop rainwater harvesting installations in villages. BAIF is implementing a large pilot project in Mundargi Taluk., Karnataka.

The rooftop rainwater harvesting technique has great potential and should be scaled up and implemented with the help of NGOs and CBO's quickly. Especially in the 20,000 habitations which have quality problem with their groundwater this is a crying need for such alternative and innovative techniques.

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