Rain Water Harvesting

Preface :- Rainwater harvesting is the accumulation and deposition of rainwater for reuse on site, rather than allowing it to run off. Rainwater can be collected from <u>rivers</u> or <u>roofs</u> and in many places the water collected is redirected to a deep pit (<u>well</u>, <u>Shaft</u> or <u>borehole</u>), a reserviour with percolation, or collected from dew or fog with nets or other tools. Its uses include water for garden, <u>livestock</u>, <u>irrigation</u>, domestic use with proper treatment, and indoor heating for houses etc. The harvested water can also be used as <u>drinking water</u>, longer term storage and for other purposes such as <u>groundwater recharge</u>.

Rainwater harvesting is one of the simplest and oldest method of <u>self supply</u> <u>of water</u> for households usually financed by the user.

Advantages of water harvesting :-

Rainwater harvesting provides an independent water supply during regional water restrictions and in developed countries is often used to supplement the main supply. It provides water when ~~there~~ there is drought, can help mitigate flooding of low lying areas, and reduces demand on wells which may enable groundwater levels to be sustained. It also helps in availability of potable water as rainwater is substaintially free of salinity and other salts. Application of rainwater harvesting in <u>urban water system</u> provides a substantial benefit for both water supply and wastewater subsystems by reducing the need for clean water in water distribution system, less generated <u>storm</u> <u>water</u> in <u>sewer</u> system, as well as reduction in stormwater ~~in sewersystem~~ runoff polluting fresh-

water bodies. More development and knowledge is required to understand the benefits rainwater harvesting can provide to agriculture.

There has been a large body of work focused on the development of life cycle Assessment and Life cycle costing Methodologies to access the level of environmental impact and money that can be saved by implementing rainwater harvesting systems.

How To Improve Water Quality :—

The concentration of contaminants is reduced significantly by diverting the initial flow of run-off water to waste. Improved water quality can also be obtained by using a floating draw off mechanism (rather than from the base of the tank) and by using a Series of tanks, withdrawn from the last in series.

Prefiltration is common practice used in industry to ensure that the water entering the tank is free of large sediment. Pre-filtration is important to keep the system healthy.

Rainwater harvesting by freshwater flooded forest :—

Rainwater harvesting is possible by growing fresh water flooded forests without losing the income from the used/submerged land. The main purpose of the rainwater harvesting is to utilize the locally available rainwater to meet water requirements throughout the year without the need of huge capital expenditure. This would facilitate the availability of uncontaminated water for domestic, industrial. and irrigation needs.

New approaches for Rainwater harvesting !—

1. <u>Roof for Catchment</u> :— Instead of using the roof for catchment, the <u>rain saucer</u>, which looks like an upside down umbrella, collect rain straight from the sky. This decreases the potential for the contamination and makes potable water for developing countries a potential application

2. <u>Groasis Waterboxx</u> :— A Dutch invention called the Groasis waterboxx is also useful for growing trees with harvested and stored dew and rain water.

3. <u>Detention Basins</u> :— Traditinally stroma water ~~using~~ management using detentions basins served a single purpose. This has the benefit of increasing water quality released and decreasing the volume of water released during combined sewer overflow events.

4. <u>Check dems</u> :— Check dams are constructed across the streams to enhance the percolation of the surface water into the subsoil strata. Thus local aquifers can be recharged quickly by using the available surface water fully for using in the dry seasons.

History :— Around the 3rd century BC, the farming communities in Balochistan and kutch, India, used rainwater harvesting for agriculture and many uses also. In ancient Tamil Nadu, rainwater harvesting was done by <u>chola kings</u>. Rainwater from the <u>Brihadeeswarer temple</u> was collected in <u>Shivaganga</u> <u>tank</u>. During the later chola period, the <u>viranam</u> <u>tank</u> was built in <u>cuddalore</u> district of Tamil Nadu state to store water for drinking and irrigation purposes. Rainwater harvesting was done in the

Indian states of Madhya Pradesh, Maharashtra and Chhattishgarh in olden days. Ratanpur, in the State of Chhattishgarh, had around 150 ponds. Most of the tanks or ponds were utilized in agriculture works. The ancient inhabitants of venice established a system of rainwater collection which was based on man made insulated collection wells. Later a venice acquired territories on the mainland, it started to import water by boat from local rivers, but the wells remained in use, and were especially importa in time of war when access to the mainland water could be blocked by an assailant.