



Water Conservation, Rainwater Harvesting And Watershed management

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Abstract

Conserving water has become a prime environmental concern, clean water is becoming increasingly scarce globally. With deforestation, surface run-off increases and the sub-soil water table drops as water has no time to seep slowly into the ground once the vegetation is cleared.

As deforestation spreads due to extensive changes in landuse, the once perennial rivers are becoming increasingly seasonal. In many areas, the small streams run dry soon after the monsoon as the water table drops further and further and further below the surface. To this is added serious problems caused by rapid surface flow of water during the rains, which leads to extensive flood with loss of life and property.

Current technologies of rainwater harvesting require that all roof and terrace water passes down into a covered tank where it can be stored for use after the monsoon. This is most advantageous in arid areas where clean water is very scarce. However, there are practical difficulties such as constructing large storage tanks which are expensive.

Key words: Environment, Water, water conservation

Water conservation

Conserving water has become a prime environmental concern, clean water is becoming increasingly scarce globally. With deforestation, surface run-off increases and the sub-soil water table drops as water has no time to seep slowly into the ground once the vegetation is cleared.

As many areas depend on wells, it has become necessary to go on digging deeper and deeper wells. This adds to the cost and further depends underground stores of water. This could take years to recharge even if the present rate of extraction is reduced, which seems hardly possible in most situations.

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When we waste water we do not realize that it affects the lives of all of us, in so many different ways. Water has to be equitably and fairly distributed so that house use, agriculture and industry all get a share of the water. Its overuse and misuse due to various activities that waste or cause pollution has led to a serious shortage of potable drinking water. Thus, water conservation is linked closely with over all human well-being.

Traditional systems of collecting water and using it optimally have been used in India for many generations. These have been forgotten in the recent past. Conserving water in multiple small percolation tanks and 'jheels' was an important feature of traditional forms of agriculture. Villages all over the country had one or more common talabs or tanks from which people collected or used water carefully.

As women had to carry water to their homes over long distance, this was a time-consuming and laborious activity, so the water could not be wasted. Many homes had a kitchen garden that was watered by the wastewater. Conservation of water was done in traditional homes through a conscious effort.

During the British period, many dams were built across the country to supply water especially to growing urban areas. After independence, India's policy on water changed towards building large dams for expanding agriculture to support the green revolution. While this reduced the need to import food material and mitigated food shortages in the country, the country began to see the effects of serious water shortages and problems related to its distribution. The newer forms of irrigated agriculture, such as sugarcane and other water-hungry cash crops, required enormous quantities of water. Finally, however, such irrigated areas become waterlogged and

unproductive. With all this ill effects of the poorly-conceived management of water at the national and local level there is a need to consider a new water policy for the country.

Saving water in agriculture: Drip irrigation supplies water to plants near its roots through a system of tubes, thus saving water. Small percolation tanks and rain water harvesting can provide water for agriculture and domestic use. Rainwater collected from rooftops can be stored or used to effectively recharge sub-soil aquifers.

Saving water in urban settings: Urban people waste large amounts of water. Leaking taps and pipes are a major source of water loss. Canals and pipes carrying water from dams to the consumer contribute nearly 50% of water loss during transfer. Reducing the demand for water by saving it is more appropriate than trying to meet growing demands.

Modern Methods of Rain Water Harvesting

As our world face serious water shortages, every drop of water we can use efficiently becomes of great value. One method is to manage rainwater in such a way that it is used at the source. If as much water as possible is collected and stored, this can be used after the rainy season is over. In many parts of the world especially in very dry areas this has been traditionally practiced. However, the stored water has to be kept pollution-free and clean so that it can be used as drinking water. Stored water can grow algae and zooplankton (microscopic animals). This can be pathogenic and cause infection. Thus, keeping the water uncontaminated is of great importance.

Current technologies of rainwater harvesting require that all roof and terrace water passes down into a covered tank where it can be stored for use after the monsoon. This is most advantageous in arid areas where clean water is very scarce. However, there are practical difficulties such as constructing large storage tanks which are expensive.

Another way of using rooftop rain water harvesting is to collect it so that it percolates into the ground to recharge wells instead of flowing over the ground into rivers. Thus. By recharging the groundwater by water harvested from rooftops, the water table rises and the surrounding wells retain water through the year.

Watershed management:

This is land management program that looks at a region from the perspective of all its water-related issues. It can be used to manage a river from its source to its termination. Watershed management could also consider the management of a single valley as a unit, based on its small streams. Saving water from its local source by allowing it to percolate into the ground by nala plugs and check dams instead of allowing it to run off rapidly along the surface during the monsoon, is a major aspect of good watershed management. This allows underground aquifers to fill so that ground water is recharged. Deforestation is a major cause of poor water supply. Afforesting such degraded areas is another important aspect of watershed management.

Rivers originate in streams that flow down mountains and hill- slopes. A group of small streams flow down hill-sides to meet large streams in the valley, which from the tributaries of major rivers. The management of a single unit of land with its water drainage system is called watershed management. It is a technique that has several components. This includes soil and water management and developing vegetative cover. The natural drainage pattern of a watershed unit, if managed property, can bring about local prosperity by providing a year-round supply of water, thereby improving the quality of life in the area.

As it provides water through the year, this improves health in the community, as clean water becomes available. Watershed management enhances the growth of agricultural crops and even makes it possible to grow more than one crop in a year in dry areas.

Watershed management begins by taking control of a degraded site through local participation. People must appreciate the need to improve the availability of water both in quantity and quality for their own area. Once

this is adequately demonstrated, the community begins to understand the project and people begin to work together to promote good watershed management.

The first technical step is to take appropriate soil conservation measures. This is done by constructing a series of trenches and mounds along the countries of the hill to hold the rain water and allow it to percolate into the ground. This ensures that under ground storage of water are fully recharged. This is enhanced by growing grasses and shrubs and planting trees, which hold the soil and prevents it from being washed away in the monsoon. However local grass cover can only increase if free grazing of domestic animals is regulated or replaced by stall feeding.

The next measure is to make nala plugs in the streams, so that the water is held in the stream and does not rush down the hill side. In selected sites, several small check-dam should be built, which together hold back larger amounts of water. All these measure constitute sound watershed management. It improves the water table and keeps the streams and nalas flowing throught the year.

Sustainable water management:

‘save water’ campaigns are essential to make people everywhere aware of the dangers of water scarcity. A number of measures need to be taken for the better management of the worlds water resources. This includes measures such as:

- Building several small reservoirs instead of few mega projects.
- Developing small catchment dams and protecting wet lands.
- Soil management, micro catchment development and afforestation permits recharging of under ground aquifers, thus reducing the need for large dams.
- Treating and recycling municipal waste water for agriculture use.
- Preventing leakages from dams and canals.
- Preventing loss in municipal pipes.

- Effective rain water harvesting in urban environments.
- Water conservations measures in agriculture, such as using drip irrigation.
- Pricing water at its real value makes people use it more responsible and efficiently and reduces wastages.
- In deforested areas where land has been degraded, soil management - by making bounds along the hill – slopes and making nala plugs- can help retain moisture and make it possible to revegetate degraded areas.

Managing a river system is best done by leaving its course as undisturbed as possible. Dams and canals lead to major floods during the monsoon and drainage of wet lands seriously affects the areas that get flooded when there is high rainfall.

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