Research Paper Environment

# Case Studies in Community Initiated Rainwater Harvesting

* Dr Mahalaxmi Krishnan

* Associate Professor of Commerce, K J Somaiya College of Arts and Commerce, Mumbai

**ABSTRACT**

*Water Harvesting and conservation plays an important role in the economic development of the country. Along side government initiatives, there is need for people participation in augmenting water resources through rainwater harvesting. This research paper examines some successful community based initiatives in rainwater harvesting.*

Keywords : Rainwater harvesting, Water resource management, Ecological Conservation, Rooftop runoff, Groundwater recharge

## 1. Introduction

India's past investments in large water infrastructure have yielded spectacular results with enormous gains in food security and in the reduction of poverty. However, this is far too inadequate vis-à-vis the demand. Inadequate financing have led to an enormous backlog of maintenance. Much of the investments in irrigation or municipal water supply are in fact belated attempts to revitalize the degenerating infrastructure.

Several parts of the country are already in crisis situations due to acute water shortages hindering economic progress. These include the most populated and economically productive parts of the country. By 2020, it is estimated that the country's demand for water will exceed all sources of supply. Notwithstanding the ruinous consequences of arbitrary pumping of groundwater, government actions – including the provision of free power – have further aggravated the situation rather than addressing the issue.

## 2. Rationale for the Present Study

Rainwater harvesting is an alternate cost effective system for cities and rural areas to increase water supplies. Traditional water harvesting systems should be revived as a practical solution for drought proofing affected areas. This research paper explores some recent community initiatives in rainwater harvesting.

## 3. Objectives of the Study

1. Study rainwater harvesting and its benefits
2. Study the traditional practices of rainwater harvesting
3. Case studies of community initiated water management

## 4. Research Methodology

This study is confined to examining cooperative rainwater harvesting initiatives by means of case studies for overcoming water crisis. Data and information for the research study were collected and analyzed from secondary published sources viz., books, newspapers, web sites and research studies.

## 5. Findings of the Study

5.1 Rainwater Harvesting

Rainwater Harvesting is a method of collecting rainwater during rainy season from the roofs or from surface catchments, storing above ground or charge the underground for later use. Water is generally stored in rainwater reservoirs or tanks or directed into mechanisms which recharge groundwater. This is appropriate in many parts where there is enough rain for collection and conventional water resources either do not exist or are at risk of being over-used to supply a large population.

Rainwater harvesting happens naturally in open rural areas. But in congested, over-paved metropolitan cities, we need to create methods to capture the rain water. Rainwater harvesting can provide lifeline water for human consumption, reduce water bills and the need to build reservoirs which may require the use of valuable land.

Traditionally, rainwater harvesting has been practiced in arid and semi-arid areas, and has provided drinking water, domestic water, water for livestock, small irrigation and a way to replenish ground water levels.

### 5.2 Benefits of Rainwater Harvesting

Rainwater harvesting can have manifold benefits for users in urban and rural areas. It is a source of soft, high quality water, reduces dependence on wells and other sources, and is cost effective. Rainwater harvesting system can range in size from a simple PVC tank to a contractor designed and built sump. Rainwater systems are inherently simple in form. Harvesting rainwater is not only water conserving, it is also energy saving as the energy required to operate a centralized water system can be eliminated.

At a household level, harvested rainwater can be used for flushing toilets, washing laundry, showering or bathing. The treated harvested rainwater can be used for drinking purposes, and reuse water (i.e. treated wastewater) for all other household water applications including toilet flushing, bathing, showers, laundry, and garden irrigation.

There are many types of systems to harvest rainwater. The type used depends on physical and human considerations. In India, reservoirs called tankas were used to store water; typically they were shallow with mud walls. Ancient tankas still exist in some places.

Rainwater may also be used for groundwater recharge, where the runoff on the ground is collected and allowed to be absorbed, adding to the groundwater. In US, rooftop rainwater is collected and stored in sump. In India this includes Bawdis and johads, or ponds which collect the run-off from small streams in wide area.

### 5.3 Traditional Practices of Rainwater Harvesting in India

Rainwater collection, management and conveyance system has been in vogue in India since time immemorial. Hundreds of years ago, rulers in princely states had created scores of traditional water storage systems so that rainwater could be harvested and it could be put to use all through the year. It

also helped to recharge groundwater channels. These have evolved specific to the eco-regions and culture. Kings of ancient kingdoms built temples with tanks in or around the temples. Tanks were built in and around the palaces so that the large contingent of staff in the palace had continuous supply of water all through the year. Ancient rulers harvested the raindrop directly or from rooftops and stored them in tanks built in their courtyards. Ancient temple tanks are essentially aquifers, which recharge the ground table. Rainwater was collected in open community lands and stored in artificial wells. Water from swollen streams and flooding rivers during the monsoon season were collected and stored in various forms of water bodies.

**5.4 Community Based Water Management Initiatives – Case Studies**

Traditionally water management was largely community based. Communities in the face of adversity set up new avenues of conserving water. The irrigation tanks (earthen bounded reservoirs constructed across slopes by taking advantage of local depressions and mounds) of South India are symbols of an ancient and rich tradition of harnessing local rainfall and stream flow for agriculture. The advent of large-scale water storage and energized systems may have left these exemplary examples of local efforts and community management somewhere along the way.

However, we see the revival of traditional water harvesting systems in various ecological zones of India. They have made checkdams, johads, rooftop runoffs and other structures to harvest rainwater.

**5.4.1 Case Study 1 - "Amritham Jalam" (Rajasthan)**

Kings built several bawris in Rajasthan. These are veritable architectural wonders built by the best artisans reflecting the glorious heritage of the princely state. Some of the structures were between 150 and 1,000 years old. During the middle age, individual houses in desert areas like Jaisalmer and Jaipur used to ensure that every drop of rainwater on their rooftop and around was harvested and used all through the year.

Over the years these traditional water harvesting and storing systems were ignored or put to disuse or misuse (dumping garbage) with people relying on depleting groundwater. The drought prone Rajasthan became a water-deficient state with an alarmingly low rainfall averaging 20 cm for about 15 days in a year.

Rajasthan Patrika, the largest daily of Rajasthan felt that if rainwater is harvested as much as possible then it can be stored to meet the entire year's needs. It came up with an idea of involving the people of Rajasthan to resurrect the dead ponds, tanks and wells across the state. It started a daily campaign in the paper called Amritham Jalam (Water is Nectar) urging people to come forward and clean up all traditional water harvesting systems that were lying dead and unused. Rajasthan Patrika had no idea that its campaign would become such a hit, a mass movement. Soon, people from all age groups joined the campaign, were at work — desilting tanks, restoring traditional wells. In the scorching sun, thousands of people in every district moved out into the open cleaning up traditional water storages. As many as 1,46,000 joined the movement. They cleaned up 385 discarded traditional ponds, wells and water storages. When rains came, these ponds, wells, etc. started filling up. After decades, the erstwhile dead bawris and stepwells again started showing signs of life.

The Amritam Jalam campaign was an eye-opener. Thousands of volunteers learnt the importance of respecting traditional wisdom. It broke down caste and communal barriers that are so strong in Rajasthan. Many of the reservoirs that were desilted like the Jaganathsagar in Jaipur were lying unused for over 20 years. When the rains came, the first signs of magic appeared. Water slowly started trickling into the reservoirs and wells. If the story is inspiring, it is because it has shown us that people can successfully take the initiative without waiting for the government to act.

**5.4.2 Case Study 2 - "Pala Thulli" (Many Drops) (Kerala)**

Kerala was reeling under severe drought in 2004, the fourth year in succession. To meet the unprecedented challenge posed by the trail of destruction and misery wrought by the unrelenting drought of 2004, Malayala Manorama started a multi-pronged campaign called "Pala Thuli" (Many Drops), the two words culled from a Malayalam proverb which says "deluges are made of many drops".

The Pala Thulli project was initiated with a front page editorial in the Malayala Manorama daily on May 23, 2004, promising the people that Manorama will join hands with them to collectively implement various projects which would enable people of Kerala to collect all the water they need throughout the year from the bounteous rainfall. The editorial said "We have 45 lakh wells. Forty four rivers which criss-crossed the landscape and an average rainfall of 3000 millimeters were the extra blessings. Still, all our storages go dry within months of the receding of the Monsoon". Manorama's effort successfully inculcated a new water culture in the people which would prevent Kerala's plentiful water from going to waste without properly using it.

**5.4.3 Case Study 3 - "Jal Hai, Tho Kal Hai"**

"If you have water, you have tomorrow"

When UNICEF initiated rainwater harvesting projects in selected schools of rural India, no one realized far reaching effects of this step. These schools had little water. Hygiene and sanitation worsened and daily routine suffered. As Chinchu, a 15 year girl from Baker Memorial Girls School, Kottayam, Kerala put it, "we often had to control natural urges as there was no water for urinals in schools."

Many schools across Rajasthan, Tamil Nadu and Kerala implemented Rainwater harvesting systems in their schools. These had salutary effects on the children. Children were affected by excessive fluoride and water scarcity causing poor sanitation and health hazards like joint pains and yellowing of teeth, etc. Rainwater harvesting systems in schools not only ensured continuous availability of water but also better quality water for drinking and sanitation. The children of these schools went home, and explained rainwater harvesting to their parents and helped them install rainwater harvesting systems in their own homes as well.

**6. Conclusion**

From the 19th century onward the colonial state centralized control over water resources. Post-independent India continued the role as the sole provider of water. As a result, there is complete dependence on the State for any kind of water requirement. However, we see revival of traditional water harvesting systems in various ecological zones in India. Examples of significant rainwater harvesting installations can be seen in every State. But we need to strengthen these installations and take them across the various districts of the State.

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