

WATER HARVESTING



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RAINWATER HARVERSTING: THE ULTIMATE SOLUTION FOR WATER SHORTAGE



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Rain water harvesting locally collects and stores rainfall through different technologies, for future use to meet the demands of human consumption or activities. The art of RWH has been practiced ever since the first human settlements and it has become a key entry point in local water management. As it involves the alteration

of natural landscape and water flows, it requires water managers to carefully consider the tradeoffs; however, it can create multiple benefits, offering synergies between different demands and users at a specific location. It is a technology that is flexible and adaptable to a very wide variety of conditions, being used in the richest and the poorest societies on our planet, and in the wettest and the driest regions of the world.

The average annual rainfall of India is 119.4 cm. Based on the rainfall, country has been divided into 35 meteorological sub-divisions. Rainfall in India is dependent in differing degrees on the South-West and North-East monsoons. Most of



the rainfall in India takes place under the influence of South West monsoon between June to September except in Tamil Nadu where it is under the influence of North-East monsoon during October and November. The Kerala State (India) that receives an average annual rainfall of 3000 mm and the northern districts receives precipitation up to 3500 mm. In spite of getting high amount of rainfall, the locality experiences severe scarcity of water during summer months. This is mainly because of the uneven rainfall distribution pattern and huge runoff due to inclined topography.

These factors coupled with low water holding capacity of the lateritic soil prevailing in this region results in moisture stress after the withdrawal of monsoon. Frequent floods and droughts, pollution, saline intrusion etc. make the water management in India highly complicated. The important water related problems of the country in general includes frequent floods and droughts, saline intrusion in the stream and coastal aquifers, pollution of water sources, soil erosion, water logging in command area, the changes in different phases of the hydrologic cycles due to large scale reclamation of wet lands, overexploitation of groundwater from certain areas and pollution of surface and groundwater sources. Ground water recharge is another aspect gaining importance. The basic principle for the same is to reduce the velocity of running water and allow it to get percolated deep into the aquifers. Water harvesting and conservation measures mainly aim at the control of soil erosion and in situ conservation of rainwater and thereby allowing more of this water to get infiltrated into the soil to replenish the ground water storage. A critical element in most soil erosion controls is the prevention of the uncontrolled movement of water across a sloping soil surface. This can be accomplished either through infiltration enhancement or improved runoff drainage. Soil and water conservation structures like contour bunds, filter strips, catch pits, graded buds, terracing, trenching etc. will also be helpful. However, all these type of interventions are to be planned scientifically considering the climatological, topographical, demographical and ecological factors. Constant efforts to send as much as runoff water to underground storage will in turn raise the water table in our wells, ponds and other water reservoirs.

Greywater Recycling

Grey water refers to wastewater generated from all domestic sources except the toilet and is almost 50%-80% household wastewater. Grey water can be used for irrigating home gardens and toilet flushing. Greywater reuse is currently limited in India. However, policy makers are beginning to realise that greywater recycling is a plausible option to reduce the shortage of existing surface water supplies. Lack of acceptance by the public is one of the main barriers for this option.

Community-based Water Management (CWM)

The best way to conserve water is by involving the local community by forming local community water management (CWM) networks. It is people-centric and hence, building the capacity of local community who has rights as well as stake in the water resources is of utmost importance. A multi-disciplinary team of all the related stakeholders should be constituted to plan and implement the initiatives heading towards conservation, water and land-use strategies and the resultant human welfare of the participating community. Participatory planning may be the right way to create awareness and familiarize the possible development opportunities and feasible options of water conservation and institutional arrangements for legal framework and the possible benefits adhering to such framework.

It needs capacity building of the local communities and the other stakeholders at all stages and levels. The participatory planning, conservation and developmental interventions in the local bio-system will not only help to cultivate ownership feeling among local communities, but ensures more sustainable and holistic ecological management. The best conservation results are achieved by forging practical alliances between the traditional village institutions and Community-based organizations (CBO) with equitable participation of women and youth. Participatory conservation initiatives that build upon existing social capital for improved common ownership and appropriately guided by common benefits through equitable access to biodiversity and benefits sharing could achieve lasting and more sustainable results.

Linking ecologically sustainable agriculture to natural resources management and water conservation to get sustainable and equitable impact at human-dominated landscapes has been emerging as alternative livelihood option in the areas that has been affected by intensive agriculture. This approach recognizes farmers as the stakeholders of water conservation in their respective territories. The strengthening alliance between farmers, scientists who promote the concept of both agriculture and water conservation, officials of irrigation departments and conservation biologists, introducing water management certification programmes and leveraging political support for water conservation are also some important aspects to be considered while linking CWM with agriculture.

It is the participation and partnership of the local community through which the community water management (CWM) can be achieved. The local community who has right and stake in the nature must be given various options of livelihood opportunities through community-scale projects. Empowering the local community through appropriate political process, while effectively addressing their interests and concerns, should be the basic strategy. Empowering local community also means mainstreaming the disadvantaged groups and women. The development departments interested in natural resources and biodiversity conservation must arrange for adequate infrastructure in terms of financial aids and facilities needed. Appropriate legal framework for conservation and resource-use by local community, monitoring of progress and evaluation of impact needs to be planned and implemented. Projects and organisations that promote community conservation initiatives should also be able to provide guidance to the communities on existing legal and policy issues as well as support linkages with such policies for ultimate linkages with existing formal system to impact policy dialogue and initiatives. Conservation-based enterprises run by the local community need adequate support in terms of awareness creation, finance and marketing strategies etc., so that there will be no issues for the local community as far as their basic livelihood needs are concerned.

In a nutshell, if the water conservation and management efforts, to be successful in a sustained manner, then the conflicting interests of local community must be met through profitable livelihood options that are in tune with the natural resources management principles such as soil and water conservation systems, biodiversity-based enterprises, agricultural systems, carbon mitigation strategies etc. Such promotion needs also support from all actors of water and other natural resources conservation at all levels either through active participation or strong partnership through appropriate political process

that empower and build the capacity of the local community in a sustained manner.

The major strategy for drought proofing would be to ensure that every home and village captures all of the runoff from the rain falling over its entire roof and the associated homestead garden, especially during years when the rainfall is normal, and stores it in tanks or ponds or divert it to recharge depleted groundwater reserves. Rainfall can cover basic human needs in dry areas in a decentralised and sustainable way and thus reduce pressures on pressures of fragile groundwater reserves. The other major positive impacts of rainwater harvesting in a watershed perspective are reduction in cost for pumping of ground water, improvement in the quality

of ground water through dilution when recharged and reduction in soil erosion & flooding in urban areas. It also helps in establishing homestead/kitchen garden and maintaining micro-level nutritional security. It is widely accepted that management activities to be taken up in a community scale to ensure its sustainability and best possible outcome. Though community based water management interventions can be achieved with low investment while ensuring high multiplying gains, the associated processes of community mobilization, education and institution building for conservation require initial effective processes of mentoring and nurturing apart from confidence building measures of local community.

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