



Awareness, Adoption and Challenges of Rainwater Harvesting among Rural Households

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Water plays a vital role in sustaining life and supporting rural development. Rural households depend on water for drinking, cooking, washing, sanitation, livestock, and small kitchen gardens. However, increasing population, climate variability, declining groundwater levels, and irregular rainfall have created serious water shortages in many villages. Women and children are often the most affected because they spend considerable time collecting water from distant sources. Rainwater harvesting is one of the oldest and most sustainable methods of conserving water. It involves collecting rainwater from rooftops or open surfaces and storing it for future domestic use or groundwater recharge. Compared to large irrigation projects, household-level rainwater harvesting systems require relatively low investment and can significantly improve water availability during dry periods.

Despite its advantages, many rural families either do not know about rainwater harvesting or are unaware of its long-term benefits. Some households believe that installing a rainwater harvesting system is expensive or difficult to maintain. Others lack technical guidance or financial support. As a result, the adoption of this technology remains lower than expected. This study focuses on understanding the awareness, adoption, and challenges of rainwater harvesting among rural households, particularly for domestic water use and small kitchen gardens rather than large-scale agricultural irrigation. Rainwater harvesting (RWH) is one of the oldest, simplest, and most sustainable methods of water conservation. It involves collecting and storing rainwater from rooftops or other suitable catchment surfaces for future domestic use or groundwater recharge. Traditionally, many communities in India practiced different forms of rainwater harvesting; however, these practices have declined over time due to increasing dependence on groundwater and piped water supply systems.

Importance of Rainwater Harvesting in Rural Areas

It increases the availability of water during periods of scarcity and reduces dependence on groundwater, hand pumps, and seasonal water sources. Households can use stored rainwater for washing, cleaning, toilet use, livestock, and watering kitchen gardens. In many cases, properly filtered rainwater can also be used for drinking. Rainwater harvesting contributes to groundwater recharge, helping maintain underground water levels. It also reduces soil erosion and minimizes surface runoff during heavy rainfall. The practice promotes efficient use of natural resources and supports sustainable rural development. Kitchen gardens maintained with harvested rainwater improve household nutrition by providing fresh vegetables throughout the year. This is especially beneficial for low-income rural families. The present study under the National Service Scheme (NSS), titled Awareness, Adoption and Challenges of Rainwater Harvesting among Rural Households highlights the importance of improving awareness and promoting the adoption of rainwater harvesting among rural households. study

was conducted in Dharampura, Pirda villages of Raipur district, Chhattisgarh, located in the Chhattisgarh Plain agro-climatic region.

Awareness of Rainwater Harvesting among Rural Households

Awareness is the first step toward adopting any new technology. Rural households receive information about rainwater harvesting from different sources such as government departments, agricultural extension workers, schools, non-governmental organizations, television, radio, newspapers, and social media. However, some households understand the importance of conserving rainwater but are not familiar with the technical aspects of constructing or maintaining a rainwater harvesting system. Others have heard about the concept but do not know how it can benefit their own households. Educational level, exposure to extension programmes, participation in village meetings, and interaction with progressive farmers significantly influence awareness. Women's self-help groups and school-based awareness programmes can also play an important role in promoting rainwater conservation practices.



Adoption of Rainwater Harvesting

The adoption of rainwater harvesting depends on several socio-economic and institutional factors. Households with better education, higher income, larger roof areas, and access to government schemes are generally more likely to adopt the technology. Most rural households that practice rainwater harvesting use rooftop collection systems connected to storage tanks. The stored water is commonly used for washing, cleaning, livestock, toilet flushing, and maintaining kitchen gardens. The adoption process is influenced not only by awareness but also by affordability, technical support, and confidence in the long-term benefits of the system.

Challenges in Adoption and Maintenance

Although rainwater harvesting offers several advantages, rural households face many practical challenges. One of the major barriers is the high initial installation cost. Many low-income families are unable to invest in storage tanks, gutters, and filtration systems without financial assistance. Another important challenge is inadequate technical knowledge. Many households are unsure about the proper design, construction, cleaning, and maintenance of rainwater harvesting structures. Poor maintenance often reduces the quality and storage efficiency of collected water, limited awareness campaigns and weak extension services also affect adoption. In many villages, people are not regularly informed about government programmes related to water conservation, irregular rainfall caused by climate change further

discourages some households from investing in rainwater harvesting systems. In addition, lack of community participation, insufficient training, and misconceptions regarding water quality continue to restrict wider adoption.

Strategies for Promoting Rainwater Harvesting

Regular awareness campaigns should be organized at the village level through panchayats, schools, Krishi Vigyan Kendras, and extension agencies. Demonstration models should be established to show the practical benefits of rainwater harvesting. Government departments should provide subsidies and financial assistance for constructing household rainwater harvesting systems. Technical guidance should also be made available to ensure proper installation and maintenance, training programmes should encourage women and youth to participate actively in water conservation activities. Community participation can strengthen local ownership and ensure the sustainability of rainwater harvesting initiatives, rainwater harvesting should also be integrated into rural development programmes and climate-resilient water management strategies.

Conclusion

Rainwater harvesting is a practical and sustainable solution for addressing household water shortages in rural areas. It enhances water security, reduces dependence on groundwater, supports kitchen gardens, and contributes to environmental conservation. Although awareness of rainwater harvesting has improved over the years, adoption remains limited due to financial constraints, inadequate technical knowledge, poor maintenance practices, and insufficient institutional support. Improving awareness through education, strengthening extension services, providing financial incentives, and encouraging community participation can significantly increase the adoption of household rainwater harvesting systems. Promoting this simple technology will contribute to sustainable rural development, improved household livelihoods, and better management of precious water resources.