

CUTS STUDY ON RAIN WATER HARVESTING IN JAIPUR, RAJASTHAN

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Report

CUTS Study on Rain Water Harvesting in Jaipur City, Rajasthan

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Introduction

Jaipur, affectionately known as the Pink City, is a captivating symbol of human resilience and resourcefulness amid the harsh desert landscape of Rajasthan. Its architectural marvels and vibrant ambiance are renowned worldwide, but Jaipur's significance runs far deeper than its picturesque facade. Behind its charming exterior lies a rich history of strategic water harvesting and supply initiatives, meticulously planned and executed by visionary rulers and innovative engineering endeavors. Delving into the annals of Jaipur's past unveils a tapestry of ingenious water harvesting techniques that have sustained its thriving civilization for centuries.

Maharaja Sawai Jai Singh II, the visionary founder of Jaipur, implemented pioneering water management strategies to combat water scarcity in Rajasthan's arid landscape. His initiatives included the construction of innovative rainwater harvesting systems, comprising baolis (stepwells), kunds (reservoirs), and tankas (underground tanks), strategically positioned to capture and store rainwater. Integrating water management into urban planning, he designed Jaipur with Vastu Shastra principles, incorporating precise grid patterns and water channels to facilitate rainwater harvesting.

Nahargarh Fort and Jaigarh Fort utilized a network of closed catchment areas connected by small canals. At Amber Fort, rainwater was collected from lake and stored in an underground water tank. The intricate water channels at Amber Fort facilitated the transfer of water. Mansagar Lake at Jal Mahal served as an artificial body of water, originally built near the Darbhawati River to receive sewage from the Walled City of Jaipur. Additionally, sites like Panna Meena Ka Kund and Galta Kund showcased traditional stepped wells and natural water sources, symbolizing Jaipur's rich heritage of sustainable water management.

Pani Pech, a significant water management project initiated in Jaipur during the 19th century, revolutionized the city's water supply system. The project involved the construction of sophisticated machinery and infrastructure to capture, store, and distribute water from nearby catchment areas to Jaipur city. Among the notable machines employed in the Pani Pech project were water lifting devices, hydraulic systems, and canal networks, designed to harness rainwater and surface water sources efficiently. One of the pivotal aspects of the project was its role in transporting water from Galtaji. However, with the passage of time and advancements in water supply infrastructure, the pump house became obsolete and fell into disuse. Recognizing its

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historical significance and architectural charm, the authorities decided to repurpose the pump house into a cafeteria which eventually closed in 2020, pre COVID.

Initially, the Ramgarh dam served as the primary source of drinking water for Jaipur, but by the late 1980s and early 1990s, much of its reservoir had dried up, leaving the city in a dire situation. To address the water crisis, the Bisalpur dam was constructed in 1990, located 120 km away in Tonk district, and began supplying water to Jaipur in 2009. However, the growing demand for water has strained the supply from Bisalpur dam.

Current Situation

In the present scenario, Jaipur's water situation is dire, as indicated by the findings of the Central Ground Water Board's 2019 report. This report categorizes all 13 zones of Jaipur city as dark zones, signifying alarmingly high levels of groundwater exploitation and underscoring the urgent need for conservation measures. With a burgeoning population, Jaipur is grappling with a staggering water demand deficit of approximately 125 MLD (Million Liters per Day). This deficit has further intensified the city's dependence on groundwater, which has plummeted by 25 meters over the past decade. Despite boasting a rich legacy of sophisticated water harvesting systems, contemporary challenges such as rapid urbanization, population expansion, and the impacts of climate change have placed immense strain on Jaipur's water resources, compelling the exploration of innovative and sustainable solutions for effective water management.

Rain Water Harvesting (RWH) in Jaipur

Jaipur is among nine districts in the state which used more underground water than was recharged through rains, according to a report by the Jal Shakti Ministry³. The capital district utilised 223% more water than it received through rains, creating an imbalance in the groundwater resources and leading to an expansion of dry zones, the report said. Jaipur district's 99% of irrigated land of 2.80 lakh hectares uses groundwater for irrigation, another report pointed out. Govindgarh Block utilises the maximum groundwater for irrigation. while Sanganer and Jhotwara blocks use the maximum for industries. The result is that 40% of the groundwater table in Jaipur has gone below 40 metres and continues to go down with every passing year.

City faces water scarcity, especially during the dry months. Rainwater harvesting helps alleviate this scarcity by capturing rainwater and storing it for later use. City heavily relies on groundwater for its water supply. Rainwater harvesting helps recharge the groundwater table, ensuring a sustainable supply of water for the city. During heavy rainfall, Jaipur often experiences flooding

³ <https://timesofindia.indiatimes.com/city/jaipur/only-220-bldgs-have-rainwater-harvesting-systems-in-city-jda/articleshow/101972348.cms>

due to inadequate drainage systems. Rainwater harvesting can help reduce the volume of rainwater runoff, thus mitigating the risk of floods.

Rainwater harvesting promotes environmental sustainability by reducing dependence on energy-intensive water supply systems and minimizing the extraction of groundwater, which can lead to land subsidence and other environmental issues. Implementing rainwater harvesting systems can lead to significant cost savings for both individuals and the city government by reducing the need for expensive water infrastructure projects and decreasing water bills.

Overall, rainwater harvesting offers a practical solution to address water scarcity, groundwater depletion, and flooding issues in Jaipur while promoting environmental sustainability and cost-efficiency.

Current Policies

According to the Rajasthan Urban Improvement Act, 1959 (Section 73-C) there was a provision to construct a water harvesting unit/structure to increase the ground water level in the setback area in plots with an area of **300 square meters** or more. In plots larger than 1000 square meters, appropriate provisions regarding water recharging structure or water harvesting structure can be determined with the technical support of the local Geology Department or an expert in the subject, keeping in view the structure of the land. These structures can be checked from time to time by the local body through a technical expert and after the technical check, if there are any deficiencies, it will be necessary to get them rectified by the developer/Resident Welfare Association. In urban areas where there are water logged areas, it will not be mandatory to build rain water conservation structures in those water logged areas. After identifying such areas by the concerned authority/district/urban body, the above requirement will no longer be there.

Department of Urban Development, Government of Rajasthan further revised the policy regarding rain water harvesting through its official order dated September 07, 2021. For environmental protection, necessary provisions of rain water conservation/harvesting and waste water purification and recycling have been mentioned in Regulations (10.11.1, 10.11.2) of the Model Rajasthan (Building Regulations) 2020.

Regarding increasing the ground water level through rain water, order says that **225 square meter** or larger area plot, provision for construction of water harvesting unit/structure is mandatory to increase the ground water level in the setback area.

To test whether the water harvesting unit/structure constructed as above is capable of working and whether it is being used effectively or not, it should be tested by the Ground Water Department/Public Resources Department and a retired engineer experienced in this field. The earnest money can be returned only after receiving the smooth operation report from the engineer. For issuing certificates by such technical experts, the prescribed fee from the local body can be taken directly from the applicant in the form of fee.

Survey on Rain Water Harvesting

In this context, a survey has been conducted by CUTS in Jaipur city during February-March 2024 to assess the level of awareness among selected households of the city. The survey was conducted in various locations within Jaipur city including Sodala, Ram Nagar, Civil Lines, Jagatpura, Banipark, Shyam Nagar, Vaishali Nagar, Pratap Nagar, Mahesh Nagar among others. A total of 83 households were visited by the team members. participated by responding to the questionnaire. They were asked a series of questions as mentioned below aimed at assessing the general awareness among households regarding water harvesting systems and government schemes associated with them in their area.

Findings of the survey

1. Do you know about rain water harvesting?

Response	Yes	No
Percentage	95	5

Regarding the knowledge of rainwater harvesting, the survey revealed that a significant majority, comprising 95% of respondents, affirmed their awareness of rain water harvesting method , while only 5% reported being unaware.

2. Did you know that rainwater can be used for more than just flowing?

Response	Yes	No
Percentage	98	4

When asked about the versatility of rainwater, an overwhelming majority, accounting for 98% of participants, acknowledged its potential for purposes beyond mere drainage, with only 4% indicating otherwise.

3. Do you think it is possible to use rainwater for daily household activities?

Response	Yes	No
Percentage	93	7

Concerning the feasibility of utilizing rainwater for daily household activities, 93% of respondents believed it to be possible, while 7% expressed it is not.

4. Are you aware of the government policies regarding rain water harvesting in Jaipur?

Response	Yes	No
Percentage	27.51	73

Awareness of government policies regarding rainwater harvesting in Jaipur appeared relatively low, with only 27% of respondents indicating familiarity, contrasting with 73% who reported being unaware.

5. Have you created rain water harvesting technology at your residence?

Response	Yes	No
Percentage	18	82

A mere 18% of participants reported having implemented rainwater harvesting technology at their residence, while the majority, comprising 82%, had not adopted such measures.

6. Do you experience water shortage problem in your area during dry season?

Response	Yes	No
Percentage	83	17

The survey highlighted that majority of the respondents 83% experienced water shortage issues during summer season, while 17% did not encounter such problems.

7. Are you satisfied with the awareness and promotion of rain water harvesting by the government

Response	Yes	No
Percentage	31	69

Satisfaction with the government's efforts in promoting rainwater harvesting was notably low, with only 31% expressing contentment, while 69% reported dissatisfaction.

8. Would you like to do rain water harvesting if you get additional rebate or grant from the government?

Response	Yes	No
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Percentage	89	11
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The prospect of engaging in rainwater harvesting if incentivized by additional rebates or grants from the government garnered substantial support, with 89.16% expressing willingness, whereas 10.84% indicated otherwise.

9. Do you think there should be strict rules or incentives for rain water harvesting in new constructions?

Response	Yes	No
Percentage	99	1

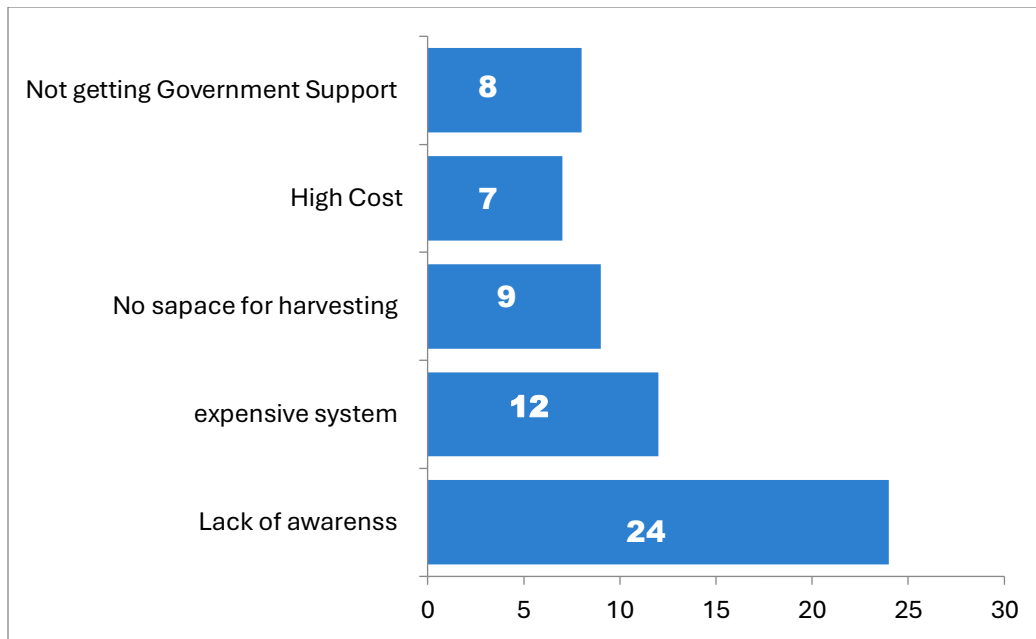
There was overwhelming support, with 99% of respondents, for the implementation of strict rules or incentives for rainwater harvesting in new constructions, contrasting sharply with the 1% who did not support such measures.

10. Can efforts be made at community level for rain water harvesting?

Response	Yes	No
Percentage	99	1

Similarly, the potential for community-level efforts in rainwater harvesting received overwhelming response, with 99% recognizing its feasibility, while only 1 % expressed doubts about such initiatives.

11. What are the main obstacles in adopting rain water harvesting structure at houses?



While responding on the question about the obstacles in adopting rain water harvesting structure at houses, 24% believes that there is lack of awareness in the general public about the rain water harvesting. However, 12% says this is an expensive system for individual household. 9% of respondents also feels scarcity of space in the houses for such structure.

Recommendations

1. Enhanced Public Awareness:

Launching comprehensive awareness campaigns to educate residents about the importance of rainwater harvesting, its benefits, and methods for implementation. This could involve organizing workshops, seminars, and interactive sessions conducted by experts in water management and conservation. Educational materials such as brochures, pamphlets, and informational videos can be distributed across communities to disseminate crucial information about rainwater harvesting techniques and their positive impact on water conservation efforts. Additionally, leveraging digital platforms and social media channels can help reach a wider audience and engage residents in discussions about sustainable water management practices. By fostering a culture of awareness and understanding among the populace, Jaipur can empower its citizens to actively participate in rainwater harvesting initiatives and contribute to the city’s water sustainability goals.

2. Stringent Enforcement and Monitoring:

Strengthening enforcement mechanisms to ensure compliance with rainwater harvesting regulations by implementing penalties for non-compliance. This requires establishing a dedicated task force or regulatory body responsible for conducting regular inspections and audits of residential and commercial properties to verify the installation and maintenance

of rainwater harvesting systems. Furthermore, implementing a system of fines or penalties for violators can serve as a deterrent and incentivize adherence to rainwater harvesting mandates. Leveraging technology and monitoring and surveillance efforts, enabling authorities to identify non-compliant properties and take appropriate enforcement actions. By enforcing regulations rigorously, Jaipur can ensure widespread adoption of rainwater harvesting practices and mitigate water scarcity challenges effectively.

3. Clear Governance Structure:

Establishing a clear governance framework delineating the roles and responsibilities of relevant government departments in overseeing rainwater harvesting initiatives. This involves streamlining coordination efforts among departments responsible for urban planning, water resources management, environmental protection, and infrastructure development. Clarifying the oversight responsibilities and decision-making authority of each department can help avoid confusion and overlap in implementation efforts. Additionally, creating a centralized platform or committee tasked with monitoring and coordinating rainwater harvesting projects city-wide can facilitate communication and collaboration among stakeholders. By fostering synergy and cooperation among government agencies, Jaipur can enhance the efficiency and effectiveness of its rainwater harvesting policies and initiatives.

4. Political Commitment:

Garnering political will and commitment from government officials to prioritize rainwater harvesting as a key component of Jaipur's water management strategy. This entails raising awareness among policymakers about the critical importance of rainwater harvesting in addressing water scarcity challenges and promoting sustainable development. Advocacy efforts by civil society organizations, water advocacy groups, and environmental activists can help mobilize support and pressure government officials to allocate sufficient resources, funding, and support for rainwater harvesting initiatives. Additionally, integrating rainwater harvesting objectives into urban planning policies, development plans, and municipal budgets can institutionalize political commitment and ensure long-term sustainability. By securing political buy-in and leadership, Jaipur can catalyze transformative change and accelerate the adoption of rainwater harvesting practices city-wide.

5. Community Engagement:

Encouraging active participation and collaboration from local communities in planning, implementing, and monitoring rainwater harvesting projects. This involves forming community-led committees or task forces comprised of residents, community leaders, and local stakeholders to spearhead rainwater harvesting efforts in neighborhoods and residential areas. Conducting community workshops, training sessions, and capacity-

building programs can empower residents with the knowledge and skills necessary to install and maintain rainwater harvesting systems effectively. Moreover, fostering a sense of ownership and collective responsibility among community members towards water conservation can inspire grassroots initiatives and innovative solutions tailored to local needs and preferences. By harnessing the collective power of communities, Jaipur can leverage social capital and grassroots activism to drive meaningful change and achieve sustainable water management outcomes.

Annexure-1

List of Stakeholders Interviewed

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