



RESTORING ECOSYSTEM OF ARAVALLIS THROUGH WATER CONSERVATION: A CASE STUDY OF ALWAR DISTRICT (RAJASTHAN)

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Abstract

Traditional water harvesting methods in many regions are still widely practised and have proven efficient and sustainable. They offer a cost-effective solution to water scarcity, especially in rural areas where access to other water sources may be limited.

However, with the advent of modern infrastructure and piped water supply systems, many traditional structures have fallen into disrepair or have been forgotten altogether.

It is crucial to revive the knowledge and practices associated with traditional water harvesting structures. By combining modern technology with ancient traditional knowledge, Rajendra Singh and his NGO, Tarun Bharat Sangh harnessed the potential of these structures to address Alwar's water challenges. This was achieved through community mobilization, awareness campaigns, funding support, and capacity-building initiatives.

Key Words: Traditional water harvesting structures, Rajendra Singh, Tarun Bharat Sangh, Alwar, Community mobilization.

Introduction:

Water deficit is a pressing issue faced by many regions across the globe, and India is no exception. Rajasthan, located in western India, is predominantly arid, with a limited water supply. In such a challenging environment, the work of Rajendra Singh, often referred to as the "Waterman of India," in water conservation in Alwar District has transformed the lives of thousands of people.

Objectives:

This paper aims to delve into the significant achievements of Rajendra Singh in addressing water scarcity, the methodologies adopted, and the far-reaching impacts of his tireless efforts that have led to a miraculous transformation of once barren land into a fertile oasis.

Research Methodology:

The researcher has adopted the doctrinal method of research. The researcher made use of a large number of resources available such as books, articles, journals and various websites.

1.1 Geographic Profile of Alwar District

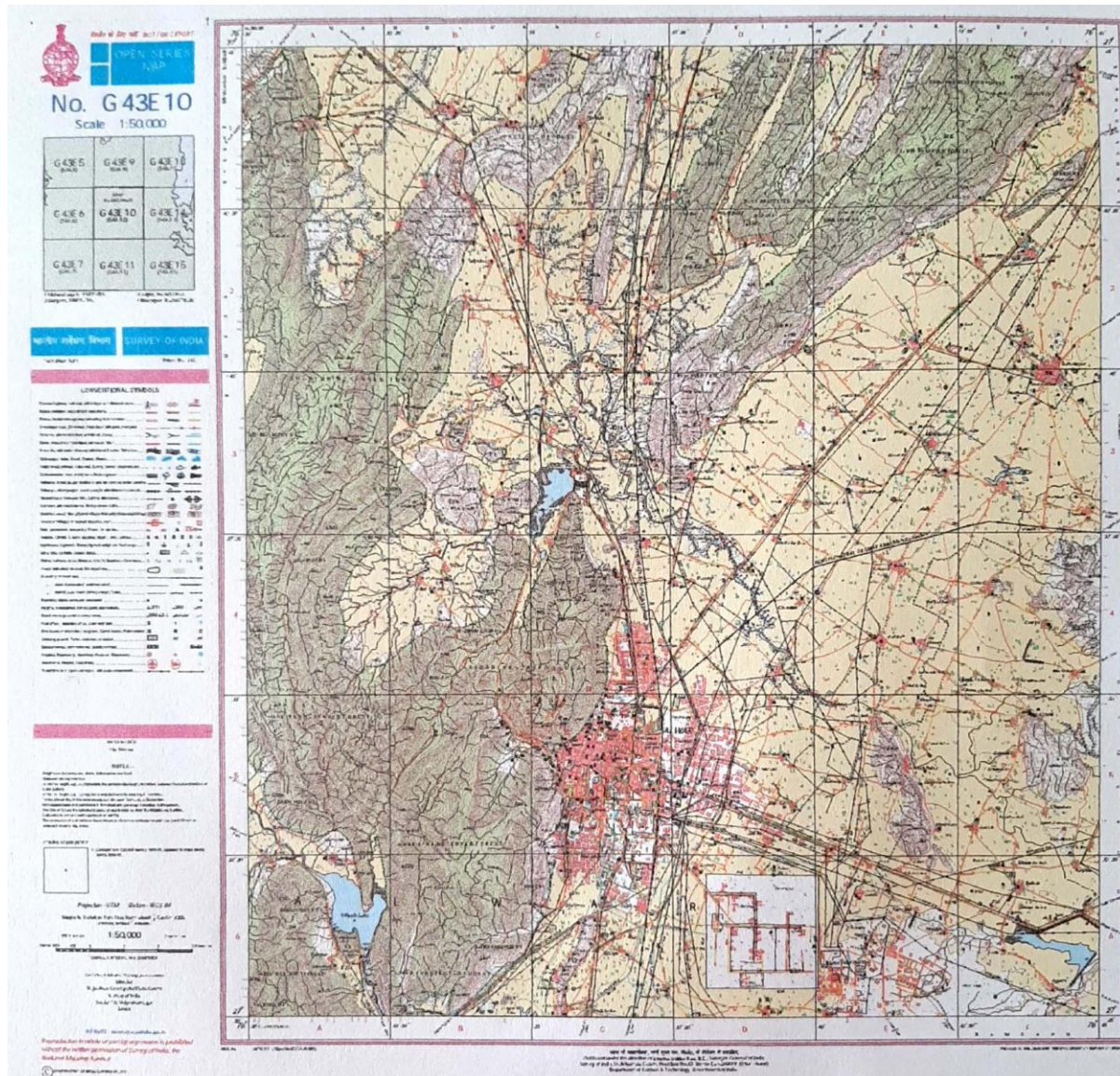


Fig 1: Topographical Sheet of Alwar District Rajasthan (Source: Survey of India)

Alwar District, located in the state of Rajasthan, covers an area of approximately 8,380 square kilometres and is surrounded by the Aravalli Range, which adds to its scenic beauty. Aravalli Range runs through seven districts of Rajasthan, a distance of 560 km out of a total length of 692 km, Alwar district being one of them. The topography of Alwar is primarily hilly, with some plains and valleys. Extreme weather conditions characterise the climate of Alwar District. Summers are scorching hot, with temperatures reaching up to 45 degrees Celsius, while winters are chilly, with temperatures dropping as low as 2 degrees Celsius. The district receives most of its rainfall during the monsoon season, from June to September. However, the rainfall is highly variable, leading to erratic water availability.

1. Background of Alwar District and the Water Crisis:

1.2 The severity of the water crisis and its impact on communities

The water crisis in Alwar District had reached a critical level by the late seventies, posing a significant threat to the communities. The district faced a severe water shortage, especially during the summer months when temperatures soar. Water scarcity led to immense hardships for the local population, particularly those living in rural areas. Mining in the Aravalli and deforestation that began during the pre-independence period led to the depletion of water aquifers. The abandoning of traditional water conservation techniques like check dams, johads and step wells accentuated the problem of water scarcity. The modern technique of bore wells that extracted water from underground rendered the entire region barren.

The impacts of the water crisis were far-reaching. Firstly, it severely affected agricultural practices, the primary source of income for many people in Alwar. Farmers needed more water to irrigate their fields, resulting in reduced crop production and economic losses. Water scarcity further contributed to the region's poverty and unemployment cycle, leading to distress migration. The area was officially declared as the 'Dark Zone'.

Secondly, the lack of clean and safe drinking water seriously threatened public health. Many communities relied on contaminated water sources, spreading waterborne diseases such as cholera and dysentery. The high prevalence of these diseases put extra stress on an already overburdened healthcare system.

Moreover, women and children bore the brunt of the water crisis as they were primarily responsible for fetching water for daily household needs. The long distances they travelled to access water sources and the physical burden of carrying heavy containers exacerbated their vulnerabilities, limiting their educational and economic opportunities.

Thus, the water crisis in Alwar District had devastating consequences for its communities. Urgent steps were required to address this issue and ensure sustainable water management. In arid areas, the implementation of collective measures and comprehensive strategies such as water conservation practices, the rejuvenation of traditional water bodies, and the promotion of rainwater harvesting significantly contributing to mitigating the crisis were the only measures that could tackle the water crisis and secure a better future for the people of Alwar District.

2. Formation and Role of Tarun Bharat Sangh (TBS):

2.1 TBS and its inception:

Tarun Bharat Sangh (TBS) was formed in 1975 by Rajendra Singh, a dedicated social activist and environmentalist, to revive and rejuvenate the traditional water management systems in the arid region of Alwar, Rajasthan, India. The NGO is in village Kishori-Bhikampura in Thanagazi tehsil, near Sariska Tiger Reserve. The organisation is driven by the ideology of community-led sustainable development, which focuses on local wisdom, participation, and indigenous knowledge.

Initially, Rajendra Singh thought of focusing on improving literacy levels in the rural areas. However, he was told by an elderly villager, Mangu Lal Meena, that water scarcity was a more significant issue to be addressed in rural Rajasthan than education.

Rajendra Singh started learning the traditional techniques from local farmers about water conservation, but his associates from the city were reluctant to work manually and parted ways. After that, with the help of a few local youths, he started desilting a johad in a village lying neglected after years of disuse. The johad filled with water during monsoon, and the wells that had dried up, too, had water. Villagers of Gopalpura, enthused by the development, contributed to making the johad broader and deeper, and in the next three years, the water was 15 feet deep.

These community efforts increased the level of groundwater and helped turn the area into a "white zone". The Forest Department appreciated the efforts of the NGO and invited them to take an active part in the management of Sariska Forest Reserve.

That is how TBS came into existence to facilitate community-driven efforts towards water conservation, restoration of ecological balance, and social upliftment.

2.2 Collaborative approach and community participation:

TBS adopted a unique approach to addressing the drought crisis by actively involving the local community in decision-making processes and implementation of water management initiatives. They recognised that the people in the region had valuable knowledge and experience that could be harnessed for sustainable change.

Through extensive community mobilisation and awareness campaigns, TBS encouraged local villagers to actively participate in water conservation activities such as building check dams, traditional water harvesting structures, and recharging groundwater aquifers. This holistic approach empowered the community and ensured the long-term success and sustainability of the initiatives. TBS also fostered collaboration with various stakeholders, including government agencies, NGOs, and corporate entities, to leverage resources, technical expertise, and policy support. This collaborative approach strengthened their efforts and expanded their reach, making TBS a leading organisation in community-based water management.

2.3 Social activism and advocacy for policy change:

In addition to on-ground activities, TBS recognised the importance of advocacy and policy change to create a more considerable impact. They actively engaged with policymakers at the local and national levels to highlight the need for prioritising water conservation and sustainable development in arid regions.

Through research, data analysis, and evidence-based reports, TBS presented compelling arguments for policy reforms and better implementation of existing water resource management laws. They raised awareness about the interconnectedness of water, environment, and human well-being, emphasising the need for a holistic approach to addressing the water crisis.

TBS played a crucial role in advocating for policies that promote community-led initiatives, incentivise sustainable practices, and recognise the ecological value of traditional water management systems. Their relentless efforts led to the formulation and implementation policies that integrated local knowledge with modern science, ensuring a more resilient and sustainable water future for the region.

Continuing its mission, TBS expanded its influence beyond Alwar, spreading its expertise and knowledge to other water-stressed regions across India and internationally. By championing community participation, collaborative approaches, and advocating for policy change, TBS became a symbol of hope and inspiration in sustainable development and water management.

3. Water Conservation Techniques Implemented by Rajendra Singh:

3.1 Traditional water harvesting structures

Traditional water harvesting structures have been integral to human civilisation for centuries. These structures, designed to capture and store rainwater, have played a crucial role in supporting agriculture, providing drinking water, and ensuring water security in arid and semi-arid regions.

One traditional water-harvesting technique is johad. A johad is a simple mud and rubble barrier built across the contour of a slope in a small watershed to accumulate rainwater. The water collected in the johad is used for irrigating fields, drinking and other domestic purposes. Johads not only help in collecting rainwater but also help improve moisture level in the sub-soil level and recharge groundwater aquifers.

Traditional water harvesting methods in many regions are still widely practised and have proven efficient and sustainable. They offer a cost-effective solution to water scarcity, especially in rural areas where access to other water sources may be limited.

However, with the advent of modern infrastructure and piped water supply systems, many traditional structures have fallen into disrepair or have been forgotten altogether.

TBS helped build more than 5000 johads in 1058 villages with the help of village communities not only covering the district of Alwar but also Dausa, Bharatpur, sawai Madhopur, Karoli and Jaipur. Besides, Johads, anicuts and small check dams too have been constructed to conserve rainwater in this region. As a result, groundwater table has gone up



Source: Down To Earth, Nayanika, September, 2001.

Location: The johad at Lava ka Baas village, Thanagazi tehsil, Alwar, Rajasthan.

and the once barren land has witnessed the increase in crop yield, availability of green fodder for cattle thus boosting milk production and ultimately increase in household incomes.

In conclusion, traditional water harvesting structures hold immense potential in ensuring water security and sustainability. It is essential to recognise their significance and promote their revival. By doing so, we can tap into the knowledge of our ancestors and adopt practices that can make a significant difference in mitigating water scarcity for future generations.

3.2 Desilting of water bodies

In addition to the water conservation techniques already mentioned, Rajendra Singh has also implemented the practice of desilting water bodies as a crucial step in water conservation. Desilting involves removing accumulated silt and sediment from lakes, ponds, and other water reservoirs, improving their storage capacity and enhancing groundwater recharge.

Rajendra Singh recognised that natural water bodies tend to accumulate sediment over time, reducing their storage capacity and hampering their ability to hold water effectively, leading to water scarcity during dry seasons and increasing the risk of flooding during heavy rainfall events. To combat these issues, Singh initiated large-scale desilting projects across various regions.

The desilting process involves manually or mechanically removing silt and debris from water bodies. Manual methods employ labourers using shovels, baskets, or sieves to extract the sediment, while mechanical methods utilise dredging machines or excavators for more efficient and faster desilting. The extracted silt can be used for various purposes, such as land reclamation or as fertiliser for agricultural fields.

By implementing desilting projects, Rajendra Singh aimed to restore the natural storage capacity of water bodies and ensure a steady water supply for various purposes, including irrigation, drinking water, and livestock. These initiatives not only helped mitigate water scarcity but also improved the overall ecological health of the regions by preventing soil erosion and filtering pollutants from the water.

3.3 Community engagement and awareness programs

To bring about a sustainable change in water conservation practices, Rajendra Singh initiated community engagement and awareness programs. These programs aimed to educate residents about the importance of water conservation, the consequences of water scarcity, and their role in conserving water resources.

Through workshops, seminars, and interactive sessions, Singh and his team provided practical knowledge and guidance on water-saving techniques, water resource management, and implementing conservation measures at the individual and community levels. These programs also emphasised the need for collective action and community-driven initiatives to achieve long-lasting results.

Additionally, Rajendra Singh utilised various media platforms, including radio, television, and social media, to reach a wider audience and disseminate information on water conservation. He collaborated with local organisations, government bodies, and educational institutions to amplify the impact of these awareness programs.

Through these community engagement and awareness initiatives, Rajendra Singh built a sense of ownership and responsibility among the residents towards water conservation. The communities' increased understanding and active participation became instrumental in the continued success of the implemented water conservation techniques.

3.4 Policy advocacy and institutional collaborations

To ensure the persistence and scalability of water conservation efforts, Rajendra Singh actively advocated for favourable policies and collaborated with regional, national, and international institutional bodies. He recognised the significance of policy frameworks in addressing water-related challenges and integrating water conservation into broader development agendas.

Singh engaged with policymakers, government officials, and environmental experts to highlight the need for sustainable water management practices. He presented evidence-based research, case studies, and success stories from his initiatives to emphasise water conservation's positive socio-economic and environmental outcomes.

Rajendra Singh promoted knowledge exchange, capacity building, and adequate water conservation policies through strategic partnerships and collaborations with relevant institutions, NGOs, and research organisations. These collaborations helped leverage resources, expertise, and political support to strengthen water conservation efforts.

The impact of Rajendra Singh's advocacy and institutional collaborations transformed water conservation from individual initiatives to collective responsibility. This mindset shift revolutionised how water was perceived and managed, leading to more sustainable and equitable use of this vital resource.

As Rajendra Singh's work continued to inspire and empower communities, the ripple effects of his water conservation efforts were felt far and wide. Through his holistic approach, combining

traditional wisdom with innovative techniques, he demonstrated that by prioritising water conservation, societies could thrive while ensuring the preservation of precious water resources for future generations.

4. Impacts of Rajendra Singh's Work:

4.1 Increase in agricultural productivity and livelihood opportunities

In recent years, there has been a significant increase in agricultural productivity and livelihood opportunities. This positive trend has brought numerous benefits for communities and individuals relying on agriculture as their primary source of income.

With the increased agricultural productivity, there has also been a corresponding rise in livelihood opportunities. The surplus production has opened avenues for farmers to venture into value-added activities such as processing, packaging, and exporting agricultural products that generate additional income and create employment opportunities for the local community.

Moreover, the increased productivity has enabled farmers to diversify their income sources and reduce their dependency solely on agriculture. Many farmers have started engaging in agro-tourism, setting up farmer's markets, or establishing small-scale agribusinesses. These entrepreneurial endeavours have not only contributed to the local economy but have also enhanced the overall well-being of the farming communities.

In conclusion, increased agricultural productivity and livelihood opportunities have brought about transformative changes in rural areas. Adopting new technologies, sustainable practices, and access to information have played pivotal roles in this positive trend. As we continue to prioritise and invest in the agricultural sector, we must ensure that these advancements benefit all farmers, including small-scale and marginalised ones, to create a more inclusive and sustainable future.

4.2 Revival of rivers

Adopting water conservation techniques and using traditional methods led to the revival of Arvari River in 1990. In 1986, the villagers of Bhanota-Kolyala village pitched in and, with the help of TBS, constructed a johad at the source of dried up Arvari river as well as tiny earthen dams, with the largest being a 244-meter-long and 7-meter-high concrete dam in the Aravalli hills; as the number of dams increased to 375, the river began to flow again in 1990, after remaining dry for over 60 years. It was observed that even after building earthen dams and digging up johads, the water level did not reach the desirable level as the water evaporated from unfilled mining pits left behind by the miners. The Supreme Court banned mining in the Aravallis on a PIL filed by the TBS. Subsequently, in 1992, the Ministry of Environment and Forests issued a notification

imposing a complete ban on mining in the Aravalli range, and 470 mines operating in the Sariska sanctuary buffer area were shut down. Gradually, with the help of villagers, TBS built 115 earthen and concrete structures inside the sanctuary and 600 or so other structures in the buffer and peripheral zones. By 1995, Aravri became a perennial river. Soon, rivers like Ruparel, Sarsa, Bhagani and Jahajwali were revived after remaining dry for decades.

4.3 Inspiration and replication in other regions

Rajendra Singh's impactful work has not only led to tangible outcomes but also served as an inspiration for others working in environmental conservation. His successful initiatives have encouraged individuals and organisations to replicate his methods in other regions facing similar challenges.

After witnessing the positive impacts on the local communities and ecosystems, many have been motivated to join the cause and work towards ensuring improved access to clean water, increased agricultural productivity, and the restoration of flora and fauna in their areas. Rajendra Singh's work has sparked a wave of enthusiasm and dedication towards environmental sustainability.

Moreover, his efforts have garnered recognition and accolades from various national and international platforms. Rajendra Singh's tireless dedication and innovative approaches to addressing water scarcity, deforestation, and socio-economic disparities have earned him numerous awards and honours. These acknowledgements validate his remarkable achievements and highlight his work's importance in creating a sustainable future.

5. Challenges Faced and Overcome:

5.1 Lack of governmental support at the initial stages

Despite the challenges faced, the project team remained determined and resilient. They recognised that lack of governmental support initially was a common hurdle many innovative initiatives face. In order to overcome this obstacle, they strategically engaged in advocacy and lobbying efforts, organising meetings with key government officials to highlight the potential benefits of their project for the local community and the overall economy.

Their persistence paid off as they secured the necessary support from the government, which played a crucial role in providing the project with the required resources and infrastructure. This governmental support not only boosted the project's credibility but also helped in navigating through various bureaucratic procedures and regulations.

Another major challenge that the project faced was resistance from vested interests. Specific individuals and groups with a stake in maintaining the status quo hesitated to embrace the project's

proposed changes. They were concerned about how the initiative might disrupt existing power dynamics or affect their interests.

The project team adopted a transparent and inclusive approach to address this resistance. The team conducted various stakeholder consultations involving the affected communities and the vested interests, allowing for a comprehensive understanding of the concerns and helping find mutually beneficial solutions.

Additionally, the project team emphasised the potential positive outcomes for all stakeholders involved. They showcased the long-term economic benefits, such as job creation and increased tourism, which could be derived from successfully implementing the project. This approach helped build trust and convinced the vested interests to support and collaborate on the initiative.

Geographic and logistical constraints were also obstacles that had to be overcome. The project was located in a remote and challenging terrain, making transporting resources and workforce complex. To resolve this issue, the team collaborated with local communities and leveraged their knowledge of the region to identify alternative routes and methods of transportation.

Furthermore, they invested in capacity-building initiatives, training the local workforce to equip them with the necessary skills to overcome logistical constraints, strengthening the project's workforce and empowering the local community by creating employment opportunities and enhancing their overall resilience.

In conclusion, the challenges faced by the project encompassed a lack of governmental support, resistance from vested interests, and geographic and logistical constraints. However, through perseverance, strategic engagement, inclusive approaches, and collaborative problem-solving, the project team successfully overcame these hurdles, realising their ambitious goals. The project's journey is a testament to the transformative power of determination and resilience in navigating obstacles and achieving sustainable progress. Another significant lesson is understanding and respecting traditional knowledge and practices. Singh incorporates the wisdom of local communities and integrates age-old techniques for water conservation in his projects. This approach not only preserves cultural heritage but also ensures the longevity and effectiveness of the solutions implemented. Furthermore, Rajendra Singh's work emphasises the importance of comprehensive and holistic approaches to water management. He recognises that addressing water scarcity requires a multifaceted strategy encompassing catchment restoration, rainwater harvesting, groundwater recharge, and afforestation. This integrated approach ensures long-term sustainability and resilience against future challenges.

6. Continuation of Rajendra Singh's work through TBS

Establishing and strengthening organisations like Tarun Bharat Sangh (TBS) is essential to ensure the continuity of Rajendra Singh's invaluable work. TBS, founded by Singh, has been instrumental in implementing sustainable water management projects and creating awareness about the importance of conserving water.

Additionally, collaboration with academic institutions and research organisations can aid in documenting and disseminating the knowledge and experiences gained through Rajendra Singh's approach. This knowledge sharing can include research papers, case studies, and training programs that empower individuals and organisations worldwide to adopt similar sustainable practices.

Conclusion:

Rajendra Singh's exemplary work in water conservation in the Alwar District of Rajasthan serves as a beacon of hope for regions grappling with water scarcity. Through his innovative strategies and community engagement, he has brought about significant positive change by providing sustainable access to water and transforming lives. The impacts of his work extend far beyond the local level, inspiring similar initiatives and promoting the conservation of this precious resource on a larger scale. However, challenges remain, and the government and society require a concerted effort to ensure the continuity and replication of such efforts throughout the country and beyond.

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