

Research

Precedent of traditional water conservation: A case study of Ara and Keram villages, Ranchi, Jharkhand

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Abstract

Life on earth is due to water. 71% of the earth is covered by water but 97% of water is stored in oceans as salt water, only 3% of water is fresh of which 2.4% is stored in the form of glaciers. 0.6% of fresh water is available for drinking and other purposes. Rainwater is the major source of freshwater hence, its conservation is extremely important. Today machines, concrete, artificial structure and technologies are being used for rainwater conservation. In the era of artificial intelligence, a few villages in the Ranchi district are conserving Millions of litres of rainwater every year by traditional methods and using it for agriculture, animal husbandry, forestry etc. People of two villages Ara and Keram have done extraordinary work by making thousands of trench cum bund (T.C.B.), loose bolder structure (L.B.S.) and dobha to conserve rainwater. Taking cognizance of this excellent performance of these villages, the Prime minister of India has appreciated his programme 'Mann Ki Baat'. This paper is an attempt to present the traditional methods of rainwater conservation in these villages. In this research paper, mainly methods and benefits of water conservation including community participation and the motivation to do this work have been highlighted.

Keywords: Traditional; Conservation; Artificial intelligence; Community; Dobha

Introduction

Water is the most important element for life on earth after air and there is no alternative either. Life on earth is due to water. 71% of the earth is covered by water but 97% of water is stored in oceans as salt water, only 3% of water is fresh of which 2.4% is stored in the form of glaciers. 0.6% of fresh water is available for drinking and other purposes. India has 16% of the world's total population but only 4% of water resources are available. Irrigation, industry and domestic use consume most water. Due to a decrease in rain, water pollution, climate change, excessive population growth, industrialization and imprudent water use by humans, the shortage of freshwater is increasing day by day. Groundwater in many cities of India has either been exhausted or is on the verge of being exhausted. In many areas of Jharkhand, there is an outcry for water during the summer season. Many villages are suffering from scarcity of drinking water due to the rapid decrease of forest area and the imbalance of climate. In this situation, rainwater conservation is the need of the hour to secure present as well as future generations.

Importance of water conservation

Three decades before, United Nations general secretary Boutros Ghali had said "If world war III were to happen, it would be fought for Water". Water conservation includes all the policies, strategies and activities to efficiently manage water resources. Water can be conserved by sensible use of water, reducing unnecessary water usage and rainwater logging. Today, government, non-government and private agencies are working for the conservation of rainwater. Agencies are working on policies and strategies to make it easier and better for water harvesting. In India, from ancient times our forefathers had a

good water management system. Our forefathers knew the importance of water long ago, so they invented many traditional ways to conserve it. Traditional water bodies are made up of circular or rectangular shapes with depths from 2-3 meters. Water is brought inside through an inlet canal on one side and from the other side extra water is removed (Nagrajan, 2006). The excellent water harvesting and drainage system in the cities of the indus valley civilization are masterpieces of their time. There are many traditional water harvesting methods still existing across the country and some glimpses of which we get to see in some villages of Jharkhand. In this era of modern technologies, a few villages near Ranchi are doing rainwater harvesting by using traditional methods and knowledge gained from their forefathers.

The modern methods of water conservation are not sufficient to fulfil the needs of people but some traditional water conservation methods are still effective to fight against the battle of water crisis (Verma, 2022). In Jharkhand, the local water management policies should be cooperative and out of government control. Government should remove administrative barriers and should promote local community participation. Water management, economic and technical implementation power should be decentralized to the local ward or gram panchayat to let them decide all activities related to water conservation (Mishra, 2021). Water cannot be created through technology but it can be conserved, recycled and reused using tools and equipment made by technology. Technology can play a great role in the conservation of heavenly asset water which could be used for domestic as well as commercial purposes in day-to-day life (Singh, P. & Singh, B., 2012)

Objectives of the study

The core objectives of the present study are:-

1. To study the traditional method and various works done for water conservation in Ara and Keram villages.
2. To analyze the contribution of government, non-government agencies and public participation in rainwater conservation.

Methodologies

The present research is mainly focused on traditional methods of rainwater harvesting and the participation of rural people in this process. Most of the research is based on primary research, for which mainly interview, observation, focused group discussion and some literature survey has been conducted.

Study area

The present study has been done at two villages Ara and Keram of Ormanjhi block, Ranchi, Jharkhand. Ranchi is the capital of Jharkhand with the average elevation of the city being 2,140 feet above sea level. Geographically, Ranchi is located on the southern part of the chota nagpur plateau which forms the eastern edge of the deccan plateau system. Ranchi has blessings of natural beauty so it is also called the "city of waterfall".

Ara and Keram villages of tundahuli panchayat under Ormanjhi block are located at (23.539087,85.442969 GCPV+J7Q Keram, Jharkhand) northern part of Ranchi district. It is connected with NH-33 and is located 33 km from Ranchi city. According to census 2011, Ara village has 90 families with a population of 427 of which 225 are male and 202 female. The average sex ratio of this village is 948 and the literacy rate is 59.38%. Keram village has 38 families with a population of 150 of which 79 are male and 71 female. The average sex ratio is 899 and the literacy rate is 57.26%.

Data

The primary data has been collected from Nav jagriti samiti of the village, other self-help groups, rural people as well as selected representatives of panchayat and employees associated with MGNREGA at panchayat and block level.

Result and Discussion

Two villages Ara and Keram are surrounded by panoramic natural beauty of forest and mountain. One decade back people of both villages were facing a severe water crisis, they had to go about 1 kilometre even for drinking water. Animal husbandry and other means of livelihood were decreasing, as a result of which people started cutting forests and migrating to cities for better livelihood and income. In 2015, 22 people from both villages were sent to hiware bazar village of Maharashtra for training on model villages through a government scheme. After returning to the village all people decided to makeover the surrounding of both the villages and they took a pledge for it. After this, they motivated all the villagers and formed a social organization named Nav jagriti samiti. Due to the serious issues of the water crisis, the first thing they decided to work on was water conservation. They didn't wait for any grant and started working without any government or non-governmental support. Every household member of Ara and Keram joined this campaign of rainwater conservation through the donation of labour (shramdan). In the beginning, they started making manual structures to store water from shramdan. Later with the support of government schemes, the villagers have done much constructive work to conserve rainwater.

1. Shramdan

Shramdan is a donation of work or labour component where people do manual work without receiving any kind of money, grain or any other physical thing against work. People work for the welfare of society with a sense of social service. At the beginning of 2016, villagers of Ara & Keram made a rule of compulsory participation in shramdan. Every month's 1st and 16th date has been fixed for shramdan. On these two dates, every adult male and female (18+ years old age) in both villages come out of their homes by taking lunch in hand and working the whole day for the development of the village without any payment. Any person can only be absent in shramdan by submitting an application for absence in gram sabha prior otherwise he or she will have to pay a penalty. Through shramdan they work for rainwater harvesting, tree plantation, maintenance of water bodies, forest and animal protection, construction of roads & drains, labelling of ground and cleanliness of village surroundings.

2. Loose Boulder Structure (LBS)

Loose boulder structure is a structure as shown in fig.1 made of small stone, boulder, wood, sand, mud and moram soil. The size of LBS varies from 5-20 feet in width and 2-5 feet in height. As both the villages are situated near mountains, rainwater runoff rapidly to lower regions which causes loss of freshwater, heavy soil erosion and damaging crops. Hence, to slow down the speed of rainwater and conserve it, villagers have constructed almost 700 LBS on the ridge of the mountain. All LBS have been made with natural things; they didn't use any artificial material like cement, bar, concrete etc. This entire work has been done by shramdan, without any government or other agencies' support. All small and big LBS have been serially numbered and regular maintenance is done in the rainy season. Its advantages are,

- Decrease in soil erosion on the slope of the mountain.
- Decrease in the flow of rainwater.
- Conservation of water near all LBS
- Millions of litres of water storage and conservation every year.
- 24 x 7 water supply for agriculture and animal husbandry through a pipe.



Figure1. Loose bolder structure, Photograph by Author

3. Trench cum bund (TCB)

TCB is a dig as shown in Fig.2 of definite dimension made to store rainwater. At the beginning of 2016, people of both villages started digging TCBs in all the sloping areas to store rainwater where it flows downward. Initially, it was being done through shramdaan but later it began to be made with the MGNREGA scheme. The size of a TCB is 12 feet in length, 3 feet in breadth and 3 feet in depth. The water storage capacity of one TCB is 1000 liters, and almost 57-60 TCBs is being constructed on 1-acre land. Villagers have constructed TCBs on a total of 300 acres of land. On this basis, almost 18000 TCBs have been constructed in both villages where 1.8 Billion litres of water are stored every year. Its advantages are,

- Source of income from horticulture
- Increase in groundwater.
- Promote tree plantation and forest cover.



Figure 2. Trench cum Bund, Photograph by Author

4. Dobha construction

Dobha is like a small pond as shown in fig.3 of definite size used to make for storage of water. Jharkhand government runs schemes for the construction of Dobha under MGNREGA and other departments. In 2016 Dobha construction was started in Ara and Keram villages through MGNREGA for rainwater harvesting. The size of a Dobha is 30 feet in length, 30 feet in breadth and 10 feet in depth. The water storage capacity of one Dobha is 9000 cubic feet. A total of 60 Dobha had been constructed manually, without using machines or any artificial material. Thus the total water storage capacity of 60 Dobha is 1.5 Billion litres every year. All the Dobha are constructed in sloping fields where rainwater flows towards the downward direction so that rainwater automatically fills in these structures. Its advantages are,

- Every year 1.5 billion litres of water storage
- Increase in groundwater level
- Livelihood creation through fishery, agriculture and animal husbandry
- Tree plantation and horticulture



Figure 3. Dobha construction, Photograph by Author

5. Deep bore well restriction

Personal deep borewell is completely banned in the entire area of these villages. Nobody can do it for commercial purposes. Borewell can only be done with the help of any government scheme which is used by everyone commonly. Borewell by gov. scheme is used in limits for agriculture & animal husbandry, domestic work, plantation, drip-irrigation etc.

Conclusion and suggestions

A decade ago both the villages Ara and Keram were facing severe challenges of water shortage. But as a result of the villager's better understanding, cooperation and work done by shramdan, today both the villages have ample water throughout the year. The groundwater level has increased due to rainwater conservation which helps in agriculture, fishery, tree plantation, and animal husbandry. Now the villagers do not even have to migrate towards cities for better means of livelihood. By using the traditional method of water conservation through loose bolder structure, trench cum bund and dobha these two villages are saving almost 5 billion litres of water every year as shown in the table below,

Table 1. Water storage in different structures

Sl. No.	Type of construction	Total no.	Total area (In Acre)	Total water conservation (in liters)
1.	Lose bolder structure	700	400	1.0 billion
2.	Trench cum bund	18000	300	1.8 billion
3.	Dobha	60	-	1.5 billion

For this extraordinary work in the field of rainwater conservation, these villages have been honoured at different levels.

Award

In 2016 these two villages got the second position in the state for commendable work in the field of water conservation and were awarded 4 lakh Indian rupees by the government of Jharkhand.

Mann Ki Baat

On 28 July 2019, the honorable Prime minister of India Shri Narendra Modi appreciated these works for water conservation by Ara and Keram in his programme Man Ki Baat.

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