

Water crisis in Rajasthan and methods of conservation a geographical study

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Abstract

Due to the vagaries of monsoon in India, there is a danger of no rain, excess rain and partial rain somewhere in the whole country. But the state of Rajasthan has a special situation in terms of water scarcity. Most of the state is desert where there is usually very little rainfall. In traditional ways, the residents of the state have built different water storage structures according to their area. Neither the 'Chief's attention on water, nor the public aware. Water conservation is far away, due to indiscriminate water exploitation, the womb of the earth is becoming waterless day by day. In Jodhpur, the home district of Chief Minister Ashok Gehlot, 258 percent water exploitation is taking place. While the water supply minister's home district is also on top in this matter, here people are extracting 221 percent water from the land. If the situation continues like this, the day is not far when people will find it difficult to get drinking water.

Keywords:- *Water crisis, methods of water conservation in Rajasthan, water conservation measures and conclusions.*

I. Introduction :-

Water exploitation is being done from 200 to 323 percent in many districts of the state. The figures of water exploitation in Rajasthan are frightening. The top districts in water exploitation are Jaipur, Jodhpur, Jaisalmer, Jhunjhunu, Dausa and Alwar. Where more than 200 percent water exploitation is happening. While the truth is that even today 60 percent of the drinking water needs of the state are being met by ground water, but the condition of ground water is worrying. Water is being overexploited in 219 blocks out of 302 blocks in the state. No one is worried about water conservation. Only 4 districts have been considered safe, although in these also more than 50 per cent water is being exploited. If we talk about the state, on an average 151.07 percent more water is being exploited than the ground water recharge. When the Ground Water Department conducted a study in seven urban areas of Ajmer, Jaipur, Jodhpur, Jaisalmer, Kota, Udaipur and Bikaner, shocking figures came to light.

state of affairs

There are 302 blocks in the state.

— Water is being overexploited in 219 blocks

— 22 blocks included in sensitive category

Semi-sensitive position of 20 blocks

— 38 blocks were considered safe

Ground water saline in 3 blocks

These districts are safe

District - Water Exploitation (in percentage)

Ganganagar – 39.56

Dungarpur — 58.86

Banswara – 64

Hanumangarh — 64.26

This district tops in water exploitation

District - Water Exploitation (in percentage)

Jaisalmer – 323

Jodhpur – 258

Jaipur — 221

Jhunjhunu – 215

Alwar — 209

Dausa — 208

These traditional water harvesting systems have stood the test of time. These systems emerged in their effective form due to various social, economic and political circumstances. Besides, their development has also happened according to the local environment. Therefore, the water harvesting methods of Rajasthan have their own distinct characteristics in the whole of India. Along with historical elements, various geographical factors also have an influence on their development. In fact, Rajasthan is a region where there are no rivers flowing throughout the year. Here water related problems arise due to irregular and less rainfall and insufficient water in the rivers. Here nature and culture are linked to each other.

In Rajasthan, the kings-maharajas and rich people who were lovers of architecture built artistic stepwells, wells, ponds, ponds and ponds in different parts of the state in order to perpetuate their name in the memory of their ancestors. There are many traditional sources of water in Rajasthan, such as Nadi, Pond, Johad, Bandha, Sagar, Samand and Sarovar. Wells are important sources of water. Many types of wells are found in Rajasthan. Apart from this, there is also stepwell or Jhalra which is considered important from religious point of view.

The traditional methods of water harvesting in Rajasthan are of high standard. The religious and cultural beliefs of the state have a major contribution in their development. Where nature and culture are in harmony with each other. The forts of Rajasthan are famous anyway but their water management is especially worth seeing and it is also educational. The tradition of water harvesting is linked to the social structure there and due to the religious attitude towards water, natural water sources are worshipped. The local people here have constructed artificial sources of water. Those who have developed folk-stories and beliefs to systematically use each drop of water, on the basis of which they have made life easy in difficult conditions by storing natural water. In the lines written on the importance of water in western Rajasthan, water has been told more than ghee.

**“Ghee dhulyan mahara na jaasi.
Drink water as per your wish.”**

For proper management of water, in western Rajasthan, even today, in remote rural areas, by placing a post in the Parati, they bathe sitting on it, so that the remaining water can be used for other purposes. The following structures of water harvesting are important in Rajasthan:

Pond

Ponds have been the main source for storing rain water. Many types of artifacts have been made in these ponds made in ancient times. They have been developed as delightful and scenic spots in every way. In these, many types of mural paintings are made in their verandahs, tibaras etc. Some used to make wells near the bottom of the ponds, which are called 'Beri'.

Proper care of the ponds was done, the responsibility of which was on the society. The maintenance of ponds built with religious spirit has been good, but today the condition of these ponds has also become pathetic and they need immediate attention. Today, due to scarcity of water in many rural areas of Rajasthan, rural women have to fetch water from long distances. Because of which most of their time is spent in arranging water.

lakes

Traditionally, maximum accumulation of water in Rajasthan is done in lakes. World famous lakes are located here. In whose construction, there has been a combined contribution of kings, emperors, barbarians and general public. The importance of lakes can be estimated from the vastness of the lakes. In Udaipur, there is a lot of water accumulation in the world famous lakes – Jaisamand, Udaysagar, Fatehsagar, Rajsamand and Pichola. Water from these lakes is used for irrigation. Apart from this, their water also seeps into the stepwells from where it is used as drinking water.

pulse

Nadi is a kind of puddle, in which rainwater is accumulated. Its catchment area is not of any specific type. The details of the construction of the first paved canal in Rajasthan are found in the year 1520, when Rao Jodhaji built a canal near Jodhpur. In western Rajasthan, almost every village has at least one nadi. While making Nadi, the place is selected keeping in mind the amount of rain water and the catchment area. In sandy plains, the nadis are 3 to 12 meters deep.

Their water catchment area (Agor) is also large. Due to less leakage here, their water lasts for seven to ten months. According to a survey by the Central Dry Research Institute, Jodhpur, 37.06 percent of the total water requirement in Nagaur, Barmer and Jaisalmer is met by the nadis. In fact, a nadi is a natural depression made on the surface of the earth, in which rainwater keeps coming and getting stored.

After some time, the water storage capacity reduces due to filling of silt, hence they are excavated from time to time. To increase the water capacity of many small channels, concrete walls are built on one or two sides. The

problem of quality in pulse water persists. Because cattle also drink water from it. Today most of the nadis are losing their original form due to pollution and accumulation of silt. Therefore, there is a need to pay attention in this direction.

Stepwell

Like wells and lakes in Rajasthan, the tradition of building stepwells (stepwells) is very ancient. Stepwells were built here in the culture of the Harappan era. The mention of stepwell construction in ancient inscriptions dates back to the first century. In ancient times, most of the stepwells were built with the support of temples. Stepwells and lakes have been important sources of drinking water and irrigation since ancient times. Like today, when there were no taps or public hand pumps in homes, housewives used to go in the morning and evening to collect drinking water from wells, stepwells and lakes. The water of stepwells is not salty because they are constructed in a very scientific manner. The main objective of constructing stepwells in Rajasthan has been the accumulation of rain water. In the beginning, there used to be stepwells in which there used to be residential arrangements. In today's era of pollution, the condition of ancient stepwells is not good. If they are renovated in time, these stepwells can become a solution to the water crisis.

frill

There is no water source in the sloughs. They get water from the seepage of ponds or lakes situated at a higher altitude. They don't have any ego of their own. The water of the Jhalars is not used for drinking, rather their water is used for performing religious rituals, mass bathing and other purposes. Most of the skirtings are rectangular in shape, with stairs on three sides. Most of the skirts have amazing architecture. These have their own special importance from the point of view of water accumulation. Today there is a need to take immediate steps towards their conservation.

Toba

The water collection center shaped like a pulse is called 'Toba'. Its agar is deeper than the nadi. Thus Toba is an important source in the Thar Desert. Land with dense structure in which water leakage is less is considered a suitable place for construction of Toba. Its slope should be downward. Its water is used by humans and cattle. Due to moisture around Toba, natural grass grows which is grazed by animals.

With the arrival of monsoon, people start living collectively by building dhanis near Toba. Normally water remains in tubs for 7-8 months. In every village in Rajasthan, Toba is made according to the animals and population of a particular caste and community. One to twenty families can use the water of one pond depending on its storage capacity. Its conservation work is done in a special way and the pond is increased by digging.

latch or stitch

Kundi is an important traditional system of storing rainwater in the sandy rural areas of Rajasthan, it is also called Kund. The water stored in it is mainly used for drinking water. It is a kind of small underground lake. Which is covered from above. At some places, the lid of this water source is also locked to prevent contamination. It is constructed in the desert, because most of the groundwater in the desert is not acceptable as drinking water due to salinity. Therefore, rainwater is collected in these kunds.

Kunds are built everywhere - in the forts built on the mountains, at the foothills of the mountains, on the roof of the house, in the courtyard, in the temple, in the village, in the Bilg area outside the village and in the fields etc. Its construction is done publicly by the people, government and private construction is done by the individual or a particular family. Private ponds are constructed in the courtyard or platform of the house, while community ponds are constructed in the Panchayat land which is used by the villagers. In villages, two open ponds are also made near these big ponds, the height of which is also kept low. Their purpose is to provide drinking water to the sheep, goats, camels and cows etc. passing nearby.

Kund or Kundi is constructed according to the place. In the lower part of the courtyard or platform, where the slope is, ponds are made which are plastered with mortar and lime. Presently, cement plaster is applied on the walls of the pond. The courtyard where rain water is collected is called Aagar or Payatan. It is kept clean throughout the year. Water flowing from the pipe enters inside through the holes. There is a net at the mouth of these holes, so that garbage and tree leaves cannot enter inside. The Kund or Kundi is 40 to 50 feet deep. In this, great care is taken about cleanliness to prevent contamination and water is also drained out.

standing

Khadin is a multi-purpose system among the traditional methods of water conservation. It is based on traditional technical knowledge. Khadin is a dam-like temporary pond made of soil, which is constructed under a sloping land. On two sides, a mud bed is raised and a strong sheet of stone is placed on the third side. This part of Khadin is called Dhora. The length of the drain varies depending on the inflow of water. If the quantity of

water is more then the water fills the khadin and enters the next khadin. In this way, by slowly drying this water, even the Khadin land can be made cultivable.

In Khadins, crops are grown by collecting water at low sloping places. The place where water collects is called Khadin and the dam that stops it is called Khadin Dam. Crops can be grown in dry areas without much effort because it neither requires much weeding nor chemical fertilizers and pesticides. A well is also made near these khadins, in which water keeps coming out of the khadins, which is used for drinking.

Water quality of traditional sources

After observing many areas, it was found that at most of the places there were trees above the stepwells due to which organic nitrates increased due to falling of leaves etc. and at other places the problem of contamination due to human activities was also seen on these water sources. Mainly these acts were seen in the form of encroachment, dumping of garbage from shops and houses. Values of dissolved oxygen and biooxygen demand were also found to be high in these contaminated water sources. Due to which excessive algae growth has also endangered the life of aquatic organisms. Therefore, the traditional water sources which were capable of supplying drinking water in the past are becoming victims of pollution today.

rainwater protection from roof top

In our country, half to two-thirds of the 4000 cubic kilometers of water that falls on the earth's surface every year gets wasted. On the other hand, indiscriminate exploitation of groundwater for the rapidly increasing population and the spreading concrete jungle in the form of concrete houses, floors and concrete roads is indicating a threat to the groundwater reserves. To combat the serious crisis arising from over-exploitation of ground water, rain water harvesting schemes have been prepared in many parts of the country. Under this, it is mandatory to store the water flowing from the roofs of buildings during the rainy season. In fact, roof top rain water harvesting technique is an effective step to increase the falling ground water.

In the modern era, the roof of buildings is mostly RCC. R.B.C. It is made in which proper arrangement for drainage of rain and other water collected on the roof is made. At many places it is allowed to fall down through some drainage holes and in some buildings it is lowered into the ground through pipes. In this way the flowing rainwater is brought to the well through pipes.

One end of this pipe is tied to the rainwater collecting pipe and the other end is left at a convenient position inside the well. A fine plastic mesh is placed on the mouth of the end of the well to prevent dust particles from entering the well. By adopting this method, an increase in the water level of the wells was observed. Therefore, collecting rainwater from the roof is an effective step for artificial recharge of groundwater.

water storage

1. Rain water should be stored according to local needs and geographical conditions.
2. To provide underground water, wherever possible, create small ponds and collect rainwater in them.
3. Collect water from the roofs of the house by making a tank in the house. Do not let the roof water of schools, colleges and other government and non-government buildings go waste. Wherever there is space in the front and back of the building, make arrangements to collect the water flowing from the roof through pipes.
4. Repair the sails of ponds and anicuts so that the water used to fill them does not flow unnecessarily. To increase the filling capacity of pond, anicut, dig out the soil from it.
5. Collect water on hilly and rough land by making embankment there also. Build ridges in your respective fields. Water will also be collected for farming, soil will also stop from flowing and ground water will also increase.
6. By adding people to Shramdaan for the digging of ponds in the villages, the work can be completed quickly.
7. Many water sources have been built in our place since ancient times. If we do not save the traditional water sources, then the future generation will not forgive us.
8. Over the years we have destroyed them by neglecting them. Without worrying further, they kept on squeezing the ground water due to which the level of ground water has gone down.
9. Revive the water sources built in villages and cities. Throw out the garbage, mud, pebbles accumulated in them.
10. Fix the routes for water to enter water sources. Remove obstructions in the path of water. We have to work together to rectify the mistakes we have made. One by one we can become many. When so many hands are doing shramdaan then why the water sources will not remain clean.
11. The heritage of wells, stepwells and ponds has been handed over to us by our forefathers. Therefore, it is our responsibility to take care of the old water sources.

Provision of water storage in National Employment Guarantee Scheme

This scheme has been implemented in the entire country from 1 April 2008. In this plan, in the list of works prepared at the central level, water conservation and water harvesting have been kept in the first order of priority. These works are completed by the local people.

There is adequate provision of funds in this national scheme. The work is also done as per the local requirement. If full monitoring is kept on this work, attention is paid to local problems, then these storage structures will be able to play an important role in solving the water problem not only in Rajasthan but in the whole country.

Making rain water harvesting system mandatory

To conserve water, it is mandatory to make rain water harvesting system on a plot of 225 square meter area in the state. It is necessary to save rain water for the land owners having 225 square meter area or more. The number of big landowners in the state is more than 10 lakh. But the cradle of making rain water harvesting system is being done only on paper.

Water conservation measures in Rajasthan

The following methods will be useful for water conservation in Rajasthan

1. Adoption of new methods for irrigation It is essential to save water that new and modern techniques should be adopted for irrigation, for this fountain and drip irrigation methods are the best. This can save 50 percent water. Similarly, the water used for conveying water through level pipes in the fields can be saved. The government is making adequate efforts in this direction and grants are also being given for this.

2. Judicious use of ground water Ground water is the main source in many parts of the state, so it should be exploited properly and used properly.

3. Control over destruction of vegetation: Vegetation helps in running the water cycle. Destruction of forests causes drought. Forests are helpful in maintaining moisture in the atmosphere and are helpful in years. Finally, preventing vegetation destruction is necessary for water conservation.

4. Harvesting of rain water i.e. rainwater harvesting Most of the rain water goes waste, so it is necessary to store it, the best way is to collect rain water on the roof of the buildings and keep it safe. rainwater

According to harvesting experts, its five methods are as follows-

(a) Directly under the ground, in this the rain water is discharged directly into the underground reservoir through a pit.

(b) Recharging by making trenches is done in the premises of big institutions by making big drains near the boundary wall and lowering them inside the ground.

(C) Draining the water in the wells The water from the roof is discharged through the pipe into the house or the well situated in it. In this way the well is recharged and the underground water level improves.

(D) Draining water into tube well The rain water accumulated on the roof can be directly discharged into the tube well through a pipe.

(B) Storing in a tank Rain water from the roof can be stored directly in a tank and can be used as

It has been done for centuries in the desert areas of Rajasthan.

Recently, a rule has been made for the buildings of the state government, under which rain water harvesting has been made mandatory for houses/establishments/hotels etc. with an area of 300 square meters or more.

5. Treatment and use of waste water A large amount of waste water gets wasted in cities and towns. It should be collected and purified and it can be used in agriculture industry etc.

6. Change in agriculture pattern and cropping pattern Keeping in view the scarcity of water, it is essential that dry farming should be adopted in arid and semi-arid areas. Similarly, such crops should be produced which require less water.

7. Water can be stored at local level by construction of small dams, ponds and anicuts etc.

8. Repair of dilapidated canal system and sealing of distributaries and drains Water is wasted due to seepage of water in old canals in the state, they should be repaired. In the same way, water can be saved by keeping the distributaries paved and providing water to the fields through paved drains. This work can be made possible with public cooperation.

II. Conclusion :-

Traditional water conservation methods have been used for water conservation in Rajasthan for centuries. Those traditional methods have been replaced today. It is necessary to conserve water by redeveloping them. Under this, the use of lakes, ponds and wells is common. Apart from this, water conservation has been done traditionally in Rajasthan through Maadi, Bawdi, Toba Khadin, Tanka or Kundi, Kui etc. It is necessary to conserve water by re-using them. The state government is also paying utmost attention in this direction at present. 10. Lake Conservation Scheme: In this scheme, the Central Government has made financial arrangements for the conservation of lakes and for the quality of their water and their beautification. Under this scheme, grants have been given for Pichola, Fatehsagar, Pushkar, Ana Sagar and Nakki Lake and have been

proposed for other major lakes. Water conservation is of utmost importance for Rajasthan and the state government is also paying adequate attention to it. Public participation with the government is also necessary because water conservation is related to every person and this campaign can be successful only when every person fulfills his responsibility.

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