

## Sustaining Arid Zones of Rajasthan with Water Harvesting Structures

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### SUMMARY

Water harvesting structures in arid regions such as Rajasthan help in promoting sustainability and enhance agricultural productivity by storing rain water during high rain fall and reusing at drought conditions for saving crops and also serve as source of water for cattle during such harsh conditions. Traditional water harvesting structures include Khadin, Nadis, Tanka, Kunds, Kuis, Baori, Jhalaras and Johads. Modern approaches of water harvesting such as rooftop rainwater harvesting, percolation tanks, check dams and recharging wells. Rain water harvesting has several benefits in agriculture by enhancing water use efficiency, halt soil erosion, improve crop productivity simultaneously provide water for people, livestock and for domestic usage altogether improve livelihood of people in arid regions.

### INTRODUCTION

The western Rajasthan of India which is characterized by harsh climatic conditions like high temperatures, erratic rainfall and sandy soils with low fertility and these arid region of western Rajasthan with low annual rainfall (327 mm) poses challenges in crop production and livelihood due to water scarcity. To combat with this drought conditions farmers has developed various water conservation techniques to improve the usage of available water. Among them water harvesting structures are the prominent and major sources of water to the people during harsh conditions. "Water harvesting" is a water conservation technique in which excess runoff water during rainfall is collected and stored for future uses during dry spells. This runoff water is collected and stored in various water harvesting structures which serve as the source of water for various uses like for drinking, domestic usage, livestock and crop irrigation. Under these conditions every drop of water becomes extremely valuable, people of this regions created their own technology for collecting and conserving rainwater. There are various traditional water harvesting structures in usage from centuries back and also developed new technologies with various modifications. All these together help in sustainability and improve livelihood of people in arid regions.

### Traditional water harvesting structures in Rajasthan

#### Khadin

Khadins are water harvesting structures where runoff water from catchment area gets stored and used for agriculture and livestock simultaneously percolates into ground and recharge ground water table also help in replenishing wells.



Fig 1. Khadin

#### Tankas

Tankas are age old traditional water harvesting and storage underground structures with circular or rectangular shape where excess runoff water is collected and used for domestic water needs. It's also serves as the source of drinking water in most of the villages of Rajasthan.



Fig 2. Tanka

**Nadis**

Nadis are village ponds where runoff water from adjoining catchment area gets stored during rainy season and this water is used for domestic purpose, livestock and irrigation. It also helps in ground water recharge by deep percolation and seepage of water.



**Fig 3. Nadi**

**Kunds**

Kunds are rain water harvesting structures similar to tanka but varies in shape and location as kunds are located outside home with circular in shape and dome shaped cover with side walls plastered with lime and ash making rainwater collection effective at low rainfall also, these structures mostly seen in the desert of Rajasthan serve as main source of drinking water.



**Fig 4. Kund**

**Kuis/ Beris**

Kuis/beris are narrow and deep well like structures dug to harvest percolated rainwater from deep sandy soils which are 5-12 m depth. Mostly seen in arid regions of India. These structures serve as source of water for domestic use, drinking and also help in enhancing ground water table level.



**Fig 5. Kuis**

**Modern Approaches to Water Harvesting in Rajasthan****Percolation Tanks**

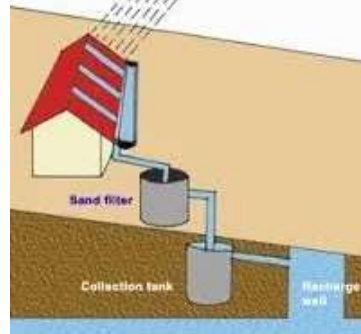
Percolation tanks are constructed to collect and store runoff water during rainfall which help in seepage of rainwater into soil and replenish underground aquifers. It also controls soil erosion and supports sustainable agriculture.



**Fig 6. Percolation tank**

### Rooftop Rain Water Harvesting

Collecting rain water from rooftops and storing for use of various purposes such as drinking, domestic usage, gardening and agriculture. Which also help in controlling wastage of water and promote ground water recharge.



**Fig 7. Rooftop rain water harvesting**

### Check Dams/ Anicuts

Check dams are the barriers constructed across a waterway, channel or drainage ditch which help in lowering the velocity of flowing water and also reduce erosion which simultaneously provide more time for percolation of water in to lower depths of soil. Stored water can be used for irrigation which enhance crop productivity and change cropping system of the area.



**Fig 8. Anicut**

### CONCLUSION

In arid regions of Rajasthan from age old people has adopted various traditional water harvesting structures which has played vital role in their livelihood. Recent water harvesting techniques also made helpful in improving crop productivity and making changes in cropping system. All together enhance water availability which is the major concern in the arid regions. Hence there is need of integrated management of rain water harvesting structures to improve sustainability by enhancing water availability which can be made possible by community involvement, educating people regarding their benefits and making policies to strengthen water harvesting structures.

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