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Comparison of traditional and modern water saving methods used in Western Rajasthan

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Abstract

The present investigation was undertaken to study the profile of rural women and awareness about water saving methods. A sample of 120 women were selected from six villages of two Panchayat Samities Bikaner and Kolayat of Bikaner district. The findings of the present study revealed that the majority of the respondents were illiterate. The overall awareness level regarding water saving methods of rural women was medium. They were used water saving methods in household activities.

Keywords: water conservation, traditional and modern methods, Drip and Sprinkler irrigation

Introduction

Water is needed to move, eat, reproduce, work and think, in other words, to survive and to live. Water resources are challenged in our world today due to pollution and overuse of the local resources. There are also fights for water between different users: farmers, people in cities and industries. We are using much more water than what is really needed and available in many locations around the world. Water covers 71% of the Earth's surface. It is vital for all known forms of life. Only 2.5% of the Earth's water is fresh water, and 98.8% of that water is in ice and groundwater. Saving water at home does not require any significant cost outlay. Although there are water-saving appliances and water conservation systems such as rain barrels, drip irrigation and on-demand water heaters which are more expensive, the bulk of water saving methods can be achieved at little cost. For example, 75% of water used indoors is in the bathroom, and 25% of this is for the toilet. The average toilet uses 4 gallons per flush (GPF). We can invest in a ULF (ultra-low flush) toilet which will use only 2 GPF. "Household water used in conservation" and reported that simulates water use in a single-family res-idential neighbourhood using end-water-use parameter probability distributions generated from Monte Carlo sampling. This model represents existing water use conditions in 2010 and is calibrated to 2006–2011 metered data. Indoor conservation is more widespread, but the savings are lower than outdoor conservation. The most cost-effective widely adopted indoor conservation actions are retrofitting bathroom faucets and showerheads, but retrofitting toilets with HETs holds the greater potential of water savings (Cahill, 2013) [3]. Water conservation at home is one of the easiest measures to put in place, and saving water should become part of everyday family practice. Human beings cannot survive more than 3 days without any source of water. Neither can other animals or plants. Water is life.

We are also wasting our water resources when we are discharging our wastes and sewage into it, making the receiving waters unsuitable for life.

Therefore, study was conducted for to access the level of rural women towards the water saving methods traditional and modern methods. Present investigation entitled "Awareness level of rural women about water saving methods used in household sector in western Rajasthan" in Bikaner District of Rajasthan was undertaken with the objective- To find out water saving methods used in Agriculture field. (a) Traditional methods (b) Modern methods.

Research Methodology

The study was conducted in Bikaner district of Rajasthan there are seven panchayat samities in Bikaner District Bikaner, Nokha, Kolayat, Lunkaransar, Shree Dungargarh, Khajuwala, Panchu. Among these, two Panhayat Samities were selected purposively- Kolayat and Bikaner, Kolayat being highly water scared Panchayat Samities among all six panchayat samities and Bikaner giving a modern touch. For selection of respondent, random sampling method was used. From the selected villages a list of farm families using water saving methods was prepared. Then from these families sample of twenty farm women from each village was selected randomly, thus making a sample size of 120 respondents.

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The interview method was used for data collection. Interview schedule was divided into two major part First section included profile of respondent and second was included questions related to different water saving methods used by farm women in household activities. Data were analysed by frequency, percentage, mean score and standard deviation.

Result and Discussion

The data in the Table-1 reveals that 16.67 per cent respondents belonged to scheduled caste and 45 per cent belonged to other backward caste, whereas, 38.3 per cent found from upper caste.

Table 1: Distribution of respondents by their caste (n=120)

S. No.	Categories	f	(%)
1.	Scheduled caste	20	16.67
2.	Other backward caste	54	45.00
3.	Upper caster	46	38.30

The Table -2 reveals that majority of the respondents 56.67 per cent had Medium family size, whereas, 36.67 per cent from large family size and 10 per cent of the respondents had small family size.

Table 2: Distribution of respondents by their family size (n=120)

S. No.	Categories	f	(%)
1.	Small (up to 4 member)	12	10.00
2.	Medium (5-8 member)	68	56.67
3.	Large (more than 8 member)	44	36.67

The data in Table- 3 clearly indicated that majority were using well, Tanka and rainfed with 17.5, 16.5 and 12.5 per cent, respectively. While in modern methods they were using sprinkler irrigation, micro sprinkler, and drip irrigation with 35.83, 12.5 and 13.33 per cent, respectively.

Table 3: Distribution of the respondents on the basis of water saving methods during agriculture (n=120)

S. No.	Water saving methods during agriculture					
	Traditional methods		Modern methods			
1.	**Well	21	17.5	Sprinkler irrigation	43	35.83
2.	**Tanka	20	16.7	Micro sprinkler	15	12.50
3.	*Rainfed (by nature)	15	12.5	Drip irrigation	16	13.33

Traditional and Modern Water Saving Methods in Agriculture Tankas

Tankas (small tank) are underground tanks. This built in the main house or in the courtyard with circular holes made in the ground, lined with fine polished lime, in which rainwater is collect, so tanka is an important component of integrated rural water supply system in western Rajasthan (Goyal and Issac, 2009) [5].



Well

A water well is a hole, shaft, or excavation used for the purpose of extracting ground water from the subsurface. Water may flow to the surface naturally after excavation of the hole or shaft. Such a well is known as a flowing artesian well. More commonly, water must be pumped out of the well (Thomas, 2003) [7].



Drip irrigation

'Drip irrigation, also known as trickle irrigation, is an irrigation method that saves water and fertilizer by allowing water to drip slowly to the roots of plants, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, tubing, and emitters. It is done through narrow tubes that deliver water directly to the base of the plant (Anonymous, 2012a) [1].



Sprinkler irrigation

Sprinkler irrigation the sprinkler system irrigates the field and thus it is widely used in sandy areas as it checks the wastage of water through seepage and evaporation. Sprinkler irrigation is a method of applying irrigation water which is similar to natural rainfall. Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air through sprinklers so that it breaks up into small water drops which fall to the ground. The pump supply system, sprinklers and operating conditions must be designed to enable a uniform application of water (Anonymous, 2012b) [2].



Micro-sprinkler

In micro-sprinkler irrigation, water is applied to the soil surface as a small spray, jet, fog, or mist. Micro-sprinkler have discharge water typically less than 175 litre/hr per micro-sprinkler and are used to irrigate tree or other wide spaced crops. Micro-sprinkler, provide better freezer protection than drip irrigation system (Lamm *et al.*, 2007)^[6].



Table 4. and Fig. 5 reveals that majority (90.8%) of the respondents were depended on rainfed (traditional method) for irrigation, while in modern methods 13.7 per cent of the respondents used 1 time irrigation in moth crop, and 83.7 per cent of the respondents used 15 time irrigation in groundnut, and 28.7 per cent of the respondents used 35 time irrigation through traditional methods, and 66.2 per cent of the

respondents used 3 time irrigation in gram crops through modern methods, while 33 per cent of the respondents used 5 time irrigation in gram through traditional methods, and 65 per cent of the respondents used 6 time irrigation in wheat crop through modern methods, and 35 per cent of the respondents used 7 time irrigation in wheat through traditional methods, and other majority 80 per cent of the respondents were depended for irrigation on traditional methods (rainfed), and 30 per cent of the respondents used 2 time irrigation in guar through modern methods.

In other, table shows that water applied to the crop vary from 5 times to 3 time depending upon the crops. Groundnut crop has maximum water requirement followed by wheat and gram, whereas guar and moth crops were grown as rainfed crop, modern methods of irrigation save water many times as compare to traditional methods of irrigation in all the crops. Maximum respondents were adopted the modern methods of irrigation in groundnut, gram and wheat crop.

On comparing both the tables it shows that under traditional methods respondents were applying more irrigations but getting less yield in wheat, gram and groundnut crop.

This clearly indicates that modern methods of irrigation save water many times, which may be used in others crops or to irrigated more area for more production.

Study conducted by Chhaba (2013) also showed that the farmers also depended on rain fed agriculture. This study was in line with the results obtained.

Table 4: Distribution of the respondents on the basis of water applied under traditional v/s modern methods of irrigation (n=120)

S. No.	Water requirement (no. of irrigation)							
	Traditional method (No. of irrigation)		f	(%)	Modern methods (No. of irrigation)		f	(%)
	Crop	Irrigation			Crop	Irrigation		
1.	Wheat	7 time	28	35.0	6 time	52	65.0	
2.	Gram	5 time	27	33.7	3 time	53	66.2	
3.	Guar	Rain water	96	80.0	2 time	24	30.0	
4.	Moth	Rain water	109	90.8	1 time	11	13.7	
5.	Groundnut	35 time	23	28.7	15 time	67	83.7	

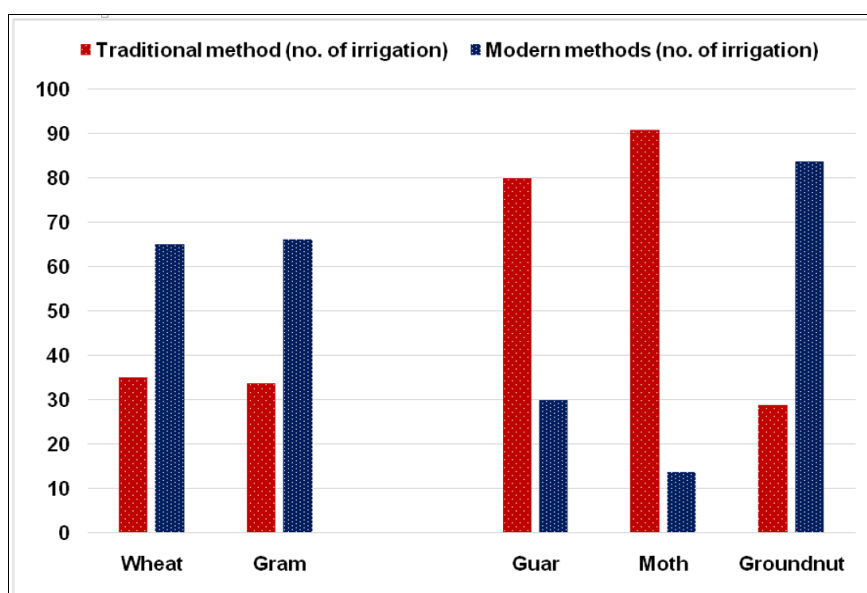


Fig 5: Distribution of the respondents on the basis of water applied under traditional v/s modern methods of irrigation (n=120)

Overall awareness level of respondents about the water saving methods in agriculture

The awareness of respondents with regard to water saving

methods in agriculture field were measured in term of mean score, mean score percent, standard deviation.

Table 5: Distribution of respondents on the basis of awareness level about water saving methods in agriculture (n=120)

S. No.	Level of awareness	f	(%)	MS	SD
1.	Low (<3)	16	13.3	15.00	12.5
2.	Medium (3-8)	95	79.1	94.92	79.1
3.	High (above 8)	9	7.5	10.08	8.4

Pooled mean percent score = 6.37

Pooled SD= 1.72

It is evident from the Table 5 that majority of the respondents 95 (79.1%) possessed to medium level of awareness followed by 13.3 per cent of respondents possessed low level of awareness and 7.5 per cent of the respondents with frequency 9 belonged to high level of awareness regarding water saving methods in agriculture.

Conclusion

It is clear from the above findings that respondents have shifted towards water saving technology in the field of agriculture. This has led to save time, energy and money. Previous water which has been a scarce commodity in western Rajasthan is being used optimally to take higher yield, cash crops with less participation of family members and labour. This saved man power is diverted to take advantage of allied activities. Government led programmes and subsidies have paid rich dividends for increasing awareness amongst respondents to

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