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Dr. RM Gupta

Scientist, College of Community Science, Punjab Agricultural University, Ludhiana, Punjab, India

Dr. A Negi

Research Fellow, College of Community Science, Punjab Agricultural University, Ludhiana, Punjab, India

Dr. P Sharma

Assistant Professor, College of Community Science, Punjab Agricultural University, Ludhiana, Punjab, India

Dr. S Kaur

Assistant Professor, College of Community Science, Punjab Agricultural University, Ludhiana, Punjab, India

Corresponding Author:

Dr. RM Gupta

Scientist, College of Community Science, Punjab Agricultural University, Ludhiana, Punjab, India

Existing water usage practices in rural households of Punjab

Dr. RM Gupta, Dr. A Negi, Dr. P Sharma and Dr. S Kaur

Abstract

As water scarcity has adversely affected many parts of the world thus usage of water conservation practices has become imperative. As women are the major stakeholder of water usage at household level it is important to know about their water usage practices. The study was carried out in randomly selected five villages namely Jandiali, Rampur, Sudhar, Humanyapura and Boparai Kalan from two randomly selected blocks of Ludhiana. From each village a sample of 25 women respondents was selected comprising a total of 125 respondents. The data was collected through questionnaire method. Percentages and mean were used to analyze the data. The findings revealed that the respondents were making judicious use of water in different household activities.

Keywords: Rural household, water usage practices, rural women, water scarcity, awareness

1. Introduction

In the era of climate change and variability, water scarcity, equitable access to water and per capita availability of water has declined over the last decades (Rodell *et al.*, 2018) [9]. Water scarcity has become a major issue due to population growth, business activity and climate change. Freshwater scarcity is expected to get worse with global warming leading to further depletion and unpredictability of surface water sources. In essence, climate-induced ecological change will alter drinking water availability, reliability, quality, quantity, and accessibility (Cole *et al.*, 2020) [4]. Developing countries are especially vulnerable to the effects of climate change (Amoo and Fagbenle, 2020) [2]. Rising temperatures are seen as some evidence of environmental change, and this has begun to lead to significant effects on water resources and will have serious growing consequences over time (Srivastav *et al.*, 2021) [16].

According to the prediction by IPCC's AR5 report (IPCC, 2014) [5], atmospheric temperatures could rise globally by 4 °C by 2100, which in turn will significantly affect global water supply and water demand. The combined impact of water supply and demand is expected to increase the gaps in demand for water supply, which exacerbates current water management challenges (Lu *et al.*, 2019) [7]. Water resources are important in supporting biodiversity and providing social and economic benefits to people (Borowski, 2020) [3]. In such situation individual's role become crucial. Improving and deepening people's understanding of water scarcity issues might lead to more environmental responsible behavior and thus a higher motivation to conserve water (Seelena *et al.*, 2019) [11]. If individuals believe that engaging in water conservation behaviors is a wise, necessary, and beneficial act and derive pleasure and satisfaction from doing so, they likely have more intention to adopt water conservation behaviors (Shahangia *et al.*, 2021) [13]. Women are domestic water managers at the household and community levels and hence women have the potential to become active stakeholders in processes of management and decision-making within the water sector (Thai and Guevara 2019) [17].

The primary goal of water demand management these days is to motivate households to conserve water by changing their water-use behavior (Lee and Tansel 2013) [6]. Household water conservation usually entails reducing water consumption (Addo *et al.*, 2018) [1]. One of the key categories of water conservation behavior is curtailment behaviors, which relate to "daily efforts to save water" (Russell and Fielding 2010) [10]. The study conducted by Rawat *et al.* (2018) [8] suggested that the well-being of rural households and rural communities can be enhanced through sustainable human interaction with environment through appropriate management practices and improved technology adoption. This will also help in gaining understanding regarding climatic adversities and their potential mitigation.

Effective management of natural resources such as water is need of the hour. Efficient water usage behavior and better social rationality plays a significant role in achieving better performance (Sen, 2021) ^[12].

Solving the future water demand challenges requires an understanding of the current water use pattern. Hence knowledge of the water use behavior is vital to influence water conservation, to implement effective water management strategies and also for sustainable development. Keeping this in view the research was carried out to examine the household's daily and activity wise water consumption.

2. Methods and Materials

The study was carried out in randomly selected five villages namely Jandiali, Rampur, Sudhar, Humanyupura and Boparai Kalan from two randomly selected blocks of Ludhiana. From each village a sample of twenty five women respondents was selected comprising a total of 125 respondents. The data was collected through questionnaire method. Frequency, percentages and mean were used to analyze the data.

3. Result and Discussion

3.1 Socio-economic profile of the respondents

Table 1 provides information regarding socio-economic

profile of the respondents where more than fifty percent (52%) of the respondents belonged to the 39-55 years of age group, 34.4 percent were in 22-38 years of age group while 13.6 percent belonged to 56-72 years of age group.

A large proportion of the respondents (28%) were educated till high school level while almost equal percentage i.e. 27.2 percent of the respondents had middle school level education followed by 17.6 percent respondents who had their education till secondary level. Twelve percent of the women had education up-to primary level while only a small percentage (8.8%) of the women was illiterate. Merely 6.4 percent respondents were Graduate.

Almost equal number of the respondents was from SC (47.3%) and General (46.4%) category and remaining 6.4 percent belonged to BC category. Fifty five percent of the women had nuclear family while remaining 44.8 percent were from joint family. Forty seven percent of the respondents belonged to small families i.e. up-to four members while 42.4 percent belonged to medium family size having 5-7 members in the family and the rest (10.4%) belonged to large families having more than 8 family members.

Table 1: Socio-economic profile of the respondents

Profile	Category	Total (n=125)	
		f	%
Age	22-38 yrs	43	34.4
	39-55 yrs	65	52.0
	56-72 yrs	17	13.6
Education	Illiterate	11	8.80
	Primary	15	12.0
	Middle	34	27.2
	High school	35	28.0
	Secondary	22	17.6
	Graduate	08	6.40
Caste	General	58	46.4
	SC	59	47.2
	BC	08	6.40
Family type	Nuclear	69	55.2
	Joint	56	44.8
Family size	Small (1-4)	59	47.2
	Medium(5-7)	53	42.4
	Large(>8)	13	10.4
Occupation	Agriculture	00	0.00
	Labour	16	12.8
	Service(G/P)	04	3.20
	Small Business	00	0.00
	Housewife	105	84.0
Land holdings	Landless	69	55.2
	Upto 2.5 acres	36	28.8
	2.5 – 5 acres	17	13.6
	5-10 acres	03	2.40
Annual Family income (Rs.)	30,000 - 1,87,000	103	82.4
	1,87,001 - 3,44,000	18	14.4
	3,44,001 – 5,00,000	04	3.20

Most of the women (84%) were housewives while 12.8 percent were also working as labours followed by a small percentage of 3.2 percent were engaged in service sector. More than half of the women (55.2%) were landless followed by nearly one third of the respondents (28.8%) had up-to 2.5 acres of land, 13.6 percent were having land from 2.5 to 5 acres while remaining 2.4 percent had 5-10 acres of land. The annual income of most of the respondent's families (82.4%) was ranging from 30,000 to 1,87,000 rupees per annum while 14.4 percent had annual income from 1,87,001 to 3,44,000

rupees and only 3.20 percent of the respondents had annual income from 3,44,000 to 5,00,000 rupees.

3.2 Existing household practices regarding usage of water in clothing and kitchen related activities

The tables given below indicate the mean values for all the existing water usage practices among women at household level. The practices were observed in terms of frequency of following them always, sometimes and never.

Regarding washing of clothes the respondents always (1.70) closed the tap from time to time while washing clothes which is a water saving habit while they sometimes thoroughly squeezed detergent from clothes (1.49) and rinsed clothes in two/three alternative buckets of water (1.36). The respondents hardly soaked clothes before washing (0.98) as they were directly washing clothes in washing machine which does not need prior soaking. The practice of rinsing clothes under running water (0.93), using washing machine even for few clothes (0.42) and letting the tap run continuously while washing (0.22) were least observed.

In terms of cleaning utensils almost all the respondents (1.90)

washed their utensils with detergent and rarely used ash (0.24). They were washing utensils at the end of cooking (1.55) and were also closing the tap time to time while washing utensils (1.61) not wasting water in between. However they were sometimes washing utensils directly under running tap (1.40) and only sometimes (1.02) washing utensils in two alternative buckets of water which could lead to water wastage. The results were in congruence with the study conducted by Sharma *et al.* (2017) ^[14] which reported that most of the farm women (98%) were fully aware that water is wasted while performing various household tasks like washing of clothes and utensils.

Table 2: Existing household practices regarding usage of water in clothing and kitchen related activities.

Practices	Mean values (0-2)
Soaking clothes before washing	0.98
Thoroughly squeezing detergent from clothes	1.49
Rinsing clothes under running water	0.93
Rinsing clothes in two/three alternative buckets of water	1.36
Closing the tap from time to time while washing clothes	1.70
Let the tap run continuously while washing clothes	0.22
Using washing machine even for few clothes	0.42
Cleaning utensils with ash	0.24
Cleaning utensils with detergent	1.90
Washing utensils in two alternative buckets of water	1.02
Washing utensils directly under running tap	1.40
Washing utensils at the end of cooking	1.55
Closing the tap from time to time while washing utensils	1.61
Washing vegetables directly under the tap	1.22
Washing vegetables in bucket of water	1.10
Using minimum water for cooking	1.64
Using pressure cooker for cooking	1.49

Mean Range 0-(Never) – 2-(Always)

The table further revealed the practices followed by the respondents regarding cooking food. A large proportion of the respondents always used minimum water for cooking (1.64). They also sometimes used pressure cooker (1.49). In case of washing vegetable sometimes they would wash them directly under the tap (1.22) and sometimes in bucket of water (1.10). It can be concluded that not much water was wasted in cooking food.

3.3 Existing household practices regarding usage of water in personal and household cleaning

The data regarding bathing in the table 3 indicated that the respondents bathed with water filled buckets always (1.54) and sometimes directly under running tap (0.58). However, they said that they rarely bathed under shower (0.30).

With regard to cleaning floors the most followed practice was first brooming and then mopping (1.67) while directly mopping was done sometimes (0.83). However washing with buckets full of water was seldom practiced (0.06). Thus not much water was seen wasted in cleaning floors.

Table 3: Existing household practices regarding usage of water in personal and household cleaning

Practices	Mean values (0-2)
Bathing directly under running tap	0.58
Bathing under shower	0.30
Bathing with water filled buckets	1.54
Washing floor with buckets full of water	0.06
Directly mopping the floor	0.83
First brooming and then mopping floor	1.67

Mean Range 0-(Never) – 2-(Always)

3.4 Existing household practices regarding usage of water in farm related activities

For bathing animals majority of the respondents always (1.55) used stored water or bucket while sometimes using water pipes for bathing animals (0.76) but rarely took animals in village pond (0.19) for bathing.

As far as practices regarding cleaning vehicles and farm machinery were concerned, majority of the respondents reported that they followed all the practices sometimes as and when required. A large proportion of the respondents first wipe with dry cloth followed by wet cloth and wash heavily soiled parts with water pipe (0.97). Almost equal numbers of respondents sometimes directly clean vehicles and farm machinery under running tap/pipe (0.94). Wiping with wet cloth (0.82) and using stored water or bucket for cleaning (0.79) was also sometimes practiced.

The table further revealed the practices regarding cleaning of animal shed. The data indicates large proportion of respondents clean their animal shed sometimes by washing with bucket of water and mug (1.38) followed by brooming sometimes (1.07). They rarely used left over rinsed water of washed clothes etc. (0.38) or wash with water pipes either on alternate day (0.14) or daily (0.10). Thus it can be concluded that the respondents didn't waste much water in cleaning animal sheds however they could also make use of left over water for the same.

Table 4: Existing household practices regarding usage of water in farm related activities

Practices	Mean values (0-2)
Using stored water or bucket for bathing animals	1.55
Using water pipes for bathing animals	0.76
Bathing animals in village pond	0.19
Cleaning farm machinery directly under running tap/pipe	0.94
Using stored water for cleaning machinery	0.79
Washing heavily soiled machinery parts with water pipe	0.97
Wipe machinery with wet cloth	0.82
Cleaning animal shed by only brooming	1.07
Washing animal shed with pipe daily	0.10
Washing animal shed with pipe on alternate days	0.14
Washing animal shed with bucket of water and mug	1.38
Using left over rinsed water of washed clothes etc. for cleaning animal shed	0.38

Mean Range 0-(Never) – 2-(Always)

3.5 Existing household practices regarding usage of water for miscellaneous activities

Table 5 showcase practices regarding miscellaneous activities. The respondents reported that they always (1.86) put off the tap while brushing teeth. They always kept small and valved flush tanks in their washroom (1.79) and always had taps of small mouth/outlet (1.70). The respondents always went for immediate check on leakage of pipes, taps, tubs and buckets (1.74) to avoid water wastage and always watered plants only when needed (1.62). However further perusal of the data revealed that they sometimes made use of stored water for other household activities (1.27) and watering lawn/garden (0.53), which is a concerning point and need more awareness. The respondents rarely sprinkled water in Courtyard Street for cleanliness (0.34). Using discarded water from RO for other household activities was also rarely made (0.19) and never used timer while watering lawn/garden. Thus it can be said that respondents followed many water saving practices at household level. Similar results were reported by Singha and Eljamal (2021)^[15] in which female participants were concerned about water scarcity and were engaged in water conservation. However in the present study it was also seen that the women were not making use of stored water and also discarding water from RO which otherwise could have been used for other household activities.

Table 5: Existing household practices regarding usage of water for miscellaneous activities

Practices	Mean values (0-2)
Making use of stored water for other household activities	1.27
Sprinkling of water in courtyard street for cleanliness	0.34
Putting off the tap while brushing teeth	1.86
Keeping small and valved flush tanks	1.79
Having taps of small mouth/outlet	1.70
Immediate check on leakage of pipes, taps, tubs and buckets	1.74
Using already used water in lawn/garden	0.53
Using discarded water from RO for other household activities	0.19
Watering plants only when needed	1.62

Mean Range 0-(Never) – 2-(Always)

4. Conclusion

The finding of the research study revealed that the respondents were not wasting much water in different household activities and were making judicious use of water. However certain activities like cleaning utensils in running water and not making use of water wasted by RO could lead wastage of more water. Further it was seen that previously used water was also thrown away which could otherwise be used for other household activities.

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