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Method of storage and purification of domestic water in Gadag district of Karnataka

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ABSTRACT

The present study was conducted during 2008-09 in urban and rural areas of Gadag taluk, Karnataka state. Total 100 samples 50 each from rural and urban areas were taken for the study. The study revealed that in general urbanites consumed higher quantity of water for various purposes than the ruralites. In urban area maximum water was used by the households for bathing purpose where 40 per cent households each used >128 or 94-128 l of water which was followed by washing. As against it in rural areas people consumed maximum quantity of water for cloth washing purpose followed by bathing. In both the areas minimum water was used for house cleaning. In urban area maximum households (48%) used plastic tanks for storage of water as against 4 per cent in rural area. Maximum rural households (56%) used big tanks for storage. Comparatively more rural people purified water before consumption as compared to urban people. Most common method of water purification in urban area was use of strainers (30%) and in rural area it was filtering (46%). In both the areas almost equal number of households (22 and 18% in urban and rural areas respectively) boiled the water before use.

Keywords: Storage, purification, households, domestic, consumption

INTRODUCTION

The world thirst for water is likely to become one of the most pressing resource issues of the 21st century. Global water consumption raised six fold between 1990 and 1995 more than double the rate of population growth and continues to grow rapidly as agricultural, industrial and domestic demand increases. Water is abundant globally but scarce locally. In some areas water withdrawals relative to supply are so high that surface water supplies are literally shrinking and ground water reserves are being depleted faster than they can be replenished by precipitation. The main water consumers are agriculture, industry and households. In spite of the fact that the earth is called the `Blue planet', 97.5 per cent of it is salt water present mainly in the oceans and only 2.5 per cent is fresh water. In addition 2.24 per cent of the world's water is contained in polar icecaps (Antarctica, Greenland etc), glaciers and deep groundwater. Only the

remaining fresh water (0.26% of the world's water) is accessible for use.

There is a fixed quantity of fresh water available from natural sources for the use of humankind but the population continues to increase and so the demand of water per capita. Water is a necessity of life and most wonderful, abundantly available useful compound of the nature among the essential elements for the existence of human beings, animals and plants. Everyday we read the report of incidents of contamination and pollution of drinking water sources. Very often a glass of plain tap water is found to contain contaminants that can cause anything from simple headache to serious diseases. This is the reason for every household to look for clean and safe drinking water or at least adopt simple methods of storage and purifying the water at household level. Singal and Sehgal (1990) in their study found that 68.75 per cent of the respondents always used mud pots whereas 40 per cent used stainless steel utensils. Only 2.5 and 16.5 per cent of them used aluminum and plastic utencils. The primary aim of water purification and water treatment is to remove any potentially dangerous contamination and also to render the water aesthetic. For this reason the water purification methods are being practiced. The habit of using traditional methods like boiling or filtering by using cloth for drinking water treatment are practiced in many parts of Africa, India and South America (Chaudhuri and Sattar 1990).

The present study was designed to analyze the methods of storage and purification of domestic water in rural and urban areas of Gadag taluk of Karnataka.

METHODOLOGY

The present investigations were carried during 2008-09 in rural and urban areas of Gadag taluk of Karnataka state. In total 100 samples 50 from rural (villages Nagavi and Kalasapur) and 50 from urban areas were included in the study. The respondents were interviewed through pre-tested schedule and the data were collected on storage and purification methods of water used by the households. The data were subjected to standard statistical tools.

RESULTS AND DISCUSSION

Consumption of water for various activities

The data on comparative consumption of water for various activities by the rural and urban households are given in Table 1. It can be inferred from the data that in general urbanites consumed higher quantity of water than the ruralites. In urban area maximum water was used by the households for bathing purpose where 40 per cent households each used >128 or 94-128 l of water. Only 20 per cent respondents consumed <94 l. This was followed by cloth washing wherein 20, 20 and 60 per cent families consumed >105, 75-105 and <75 l of water respectively. Minimum quantity of water was used for

house cleaning purpose as 20, 20 and 60 per cent households used just >18, 12-18 and <12 l water respectively. The results are supported by the findings of Rajagopal and Gnanambal (1995). Moderate quantities of water were utilized for other activities such as drinking, cooking and dish wasing. The trends remained almost same in rural area. The ruralites however consumed maximm quantity for cloth washing (>90, 50-90 and <50 l water used by 40, 20 and 40 per cent households respectively) followed by bathing (>68, 40-68 and <40 l water used by 20, 60 and 20 per cent households respectively). As in case of urban areas the rural people also used minimum water for house cleaning (20, 20 and 60 per cent using >8, 6-8 and <6 l water respectively). The results are in line with those of Birdie and Birdie (1998).

Table 1. Water consumption for different household activities in rural and urban households

N= 100

SN	Purpose	Amount of water consumed Urban n=50		Amount water consumed Rural n=50	
1	Drinking	<25	10 [20.00]	<15	20 [40.00]
		25-39	20 [40.00]	15-20	20 [40.00]
		>39	20 [40.00]	>20	10 [20.00]
2	Cooking	<29	20 [40.00]	<12	10 [20.00]
		29-39	10 [20.00]	12-18	20 [40.00]
		>39	20 [40.00]	>18	10 [20.00]
3	Cloth washing	<75	30 [60.00]	<50	20 [40.00]
		75-105	10 [20.00]	50-90	10 [20.00]
		>105	10 [20.00]	>90	20 [40.00]
4	Dish washing	< 41	30 [60.00]	<35	20 [40.00]
		41-59	10 [20.00]	35-42	10 [20.00]
		>59	10 [20.00]	>42	20 [40.00]
5	Bathing	<94	10 [20.00]	<40	10 [20.00]
		94-128	20 [40.00]	40-68	30 [60.00]
		>128	20 [40.00]	>68	10 [20.00]
6	House cleaning	<12	30 [60.00]	<6	30 [60.00]
		12-18	10 [20.00]	6-8	10 [20.00]
		>18	10 [20.00]	>8	10 [20.00]

Figures in parentheses indicate percentage

Devices used for water storage

The data on various devices used for storage of water by rural and urban households are given Table 2. In both the areas people were found using different devices for this purpose. In the urban area maximum households (48%) used plastic tanks followed by big vessels (34%) and underground tanks (28%). Only 6 per cent households each used buckets or earthenware for water storage. As against it in rural areas maximum households (56%) used big vessels followed by drums (38%) and cement tanks (22%). Here 6, 4, 4 and 2 per cent people used plastic tubs, plastic tanks, underground tanks and upper tanks respectively.

While comparing the devices used by urban and rural people it was found that only 4 per cent people in rural areas used plastic tanks as against 48 per cent in urban area. This could be due to the reason that in urban area people keep plastic tanks on their roofs and connect them to internal water supply which is not there in rural area. Similarly more rural people (20%) used plastic buckets as against 6 per cent in urban area since urban people have connected water supply from plastic tanks and do not bother to store water in buckets. However in both the areas earthenware was becoming obsolete as only 6 and 8 per cent households in urban and rural areas respectively used them.

Table 2. Methods of water storage in urban and rural areas

Device used	No of households using the device	
	Urban area (n= 50)	Rural area (n= 50)
Upper tank	12 (24.00)	1 (2.00)
Plastic tank	24 (48.00)	2 (4.00)
Underground tank	14 (28.00)	2 (4.00)
Drums	10 (20.00)	19 (38.00)
Big vessels	17 (34.00)	28 (56.00)
Cement tank	5 (10.00)	11 (22.00)
Stone tank	4 (8.00)	9 (18.00)
Earthenware	3 (6.00)	4 (8.00)
Plastic tub	12 (24.00)	3 (6.00)
Bucket	3 (6.00)	10 (20.00)

Figures in parentheses are per cent values

Table 3. Methods of water purification used in urban and rural areas

Method used for water purification	No of households using the technique	
	Urban area (n= 50)	Rural area (n= 50)
Strainer	15 (30.00)	8 (16.00)
Aquaguard	1 (2.00)	0 (0.00)
Boiling	11 (22.00)	9 (18.00)
Using tablets	0 (0.00)	16 (32.00)
Using plant products	0 (0.00)	1 (2.00)
Use of potash	0 (0.00)	0 (0.00)
Filtering	7 (14.00)	23 (46.00)
Cloth	2 (4.00)	21 (42.00)

Figures in parentheses are per cent values

Methods used for water purification

The data on methods used by households for purifying water are given in Table 3. It is evident from the data that people used multiple techniques for purifying water. However comparatively more people purified water before consumption in rural area compared to urban area. Most common method of water purifying was strainers in urban area as 30 per cent people used them. No household in urban area used plant products or potash whereas only 2 per cent used aqauguards and 4 per cent used cloth. Contrary to it in rural area maximum people (46%) used filtering followed by cloth filtering (42%) and chemical tablets (32%). Here no one used aquaguards or potash and 2 per cent people used plant products. In both the areas almost equal number of households (22 and 18% in urban and rural areas respectively) boiled the water before use. The reason for more number of people using purifying techniques in rural area as compared to urban area could be that urban people got already treated water which was not true for rural area. These studies are in line with those of Choudhuri and Sattar (1990).

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