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A SURVEY OF HOUSEHOLD WATER CONSUMPTION PATTERNS IN BEKI RIVER BASIN, ASSAM

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Abstract

The demand for water is rising in both the urban and rural areas of India as a result of development. Disputes regarding the sharing of water resources may grow as a result of this. The specifics of a household's actual water use are essential for water demand management. The water supply system has been under pressure as a result of the increased demand for water, which has resulted in environmental issues like imbalances in ecosystems and overexploitation of water resources. In order to gain a better understanding of how local communities in the region relate to water, this paper uses questionnaires and interviews with 1267 households to investigate the pattern of domestic water consumption in the Beki River Basin area of Assam. Statistics were used to analyse the data. A stream rate study was intended to evaluate the singular stream rate for every family. The study looked at household water consumption on a daily and activity-by-activity basis, as well as the sources, quality, duration, and frequency of water supplies, as well as the degree of awareness of rainwater harvesting. This should be tended to quickly by changing public insight through media and by sorting out open mindfulness programs. The hope is that the study's findings will help policymakers and planners in India make the most of the water resources they already have for rural development. The findings suggest that people with higher incomes in the areas use more water. The family size, age, education level, and number of taps in the household all influence how much water is used in a household. Additionally, the majority of household members are unaware of the study area's efficient water use.

Key words: Beki River, Water Consumption, water resources, Rain water harvesting etc.

Introduction

According to Jury and Vaux (2006), the most pressing issue facing humanity and the world is not the threat of war, epidemic, or the breakdown of civil administration; rather, the daunting issue of water scarcity. According to Gopaldas and Gujral (1995), families, particularly those consisting of women and children, face a great deal of difficulty as a result of the scarcity of water. These families are forced to spend numerous hours each day collecting water from far-off sources. Water is necessary for life and serves as the foundation for any nation's social and economic development. It is mostly used in industries, agriculture, and at home. Additionally, the availability of water at farm levels is largely a factor in food production. In the twenty-first century, rising population, urbanization, and climate change may reduce global water supplies (Murad et al.).2007; Verhoeven and Wheida, 2007). The industrial sector, urbanization, and agricultural

crops all compete for water consumption. Because the world's population will reach 9 billion by the end of 2050, food production will require even more water in the future. Humans are losing access to clean, potable water in many countries due to environmental degradation. The current expansion of the global economy has far-reaching effects on the utilization of water resources. Interestingly, fresh water resources are also being put under pressure as a result of changes in lifestyle and water consumption rates. In developing nations, rural areas frequently lack access to water facilities. According to Briscoe and Deferranti (1988), such facilities rarely see full use.1992 World Health Organization; Sharma and co.1996). The fact that engineering and technical considerations dominated their design and implementation is partly to blame for this underutilization. The number and size of households are two additional factors that influence rural water use (Sandiford et al.).1990;1990 Schefter)

The host communities' cultural and social attitudes regarding water use were not taken into consideration. Rathgeber (1996) argues that water planners in developing nations typically make the assumption that households and other social groups in rural communities will alter their water use practices to accommodate and benefit from an improved water supply, supporting this criticism. They are oblivious to the fact that the newly available water may not be utilized to its full potential due to the fact that it does not conform to the existing norms of these social groups. It is expedient for water planners to comprehend the existing water use patterns of the local population and how they may adapt to the new facility before providing new rural water facilities. Several factors, including economic, cultural, climatic, and water availability and accessibility, influence how nations and communities use water. Due to the extremely limited availability of water resources, water is regarded as one of the most pressing and delicate issues in arid and semi-arid climates (Nyong and Kanaroglou, 1999; Al-Khatib and others2003). In these areas, the majority of fresh water supplies come from the limited groundwater resources. In recent decades, these communities have experienced a severe water shortage. Additionally, the situation is anticipated to become even more dire as a result of projected population growth and associated water demands. Both proper water demand management and proper water supply management are becoming increasingly important as a result of rapid population growth (White and Fane, 2001;2005, Mathurasa).

Both urban and rural areas in India are seeing an increase in the demand for water as a result of population growth and economic development. According to Kumar et al., the per capita average annual supply of fresh water has decreased from 5,177 m3 in 1951 to 1,820 m3 in 2001, and it is anticipated that it will further decrease to 1,341 m3 in 2025 and 1,140 m3 in 2050.2005).The sharing of water resources may become more contentious as availability decreases (Rao, 1975;2007 (Shaban and Sharma)In both rural and urban areas, a significant portion of the less fortunate population wastes valuable time collecting water for their daily needs.In order to estimate the best way to use the water resources at hand, it is therefore necessary to have information on how a population (village) uses water. When developing a comprehensive rural water policy that will meet the growing demands of the villagers, investigations of this kind are crucial. Additionally, the study's findings regarding the villages in the Assamese Beki River basin

will serve as a model for rural sector water resource managers in semi-arid regions of India and elsewhere around the world.

Study area

In the field of water management, the area under investigation has remained neglected.As a result, the examination of the basin's applied management of water consumption has been extraordinarily extensive.The most important task is to comprehend and recognize the fluvio-geomorphological pattern and utilization of the Beki channel and its basin.As a result, future geomorphologists, organizers, overseers, and other field researchers will benefit from the review. The Beki River Basin in Assam, India, is the largest toward the south draining parkway river basin. Kurichu, in Bhutan, is a trans-limit partner.The Beki or Mora Manas begins at Mathanguri, at an elevation of 97 meters, at the Manas' debouching point.It is the easternmost channel of the present Manas association.It flows south, passing by Narainkuri, Chafakamar, Chengla, Jaipur, Goraimarigaon, Karakura, Kadang, and Majidbhita. At an elevation of nearly 30 meters, it joins the Brahmaputra near Baghbar.The channel distance of the Beki Waterway is 90 km while the veritable stream distance is 69 km. over a distance of approximately 3744.75 km2, the stream and its leakage channels direct through the fields of Assam for approximately 85 km.The provincial landscapes, yields, steers, and people of the district of Assam have been profoundly affected by the breakdown and redundant floods of particularly grave severity caused by the Beki River.The survey district spans the latitudes of 90^0 $52^/$ $5.736^{//}$ E and 90^0 $55^/$ $1.601^{//}$ E, or 26^0 $28^/12.74^{//}1$ N to 26^0 $20^{//}$ $5.358^{//}$ N.The climate is very different from one region to the next, ranging from warm, humid subtropical conditions in the south to cold, dry highs in the north. The tropical rainstorm climate has two distinct seasons—summer and winter—from May to October. The rainy season lasts from June to September, the middle of the year, from March to May. The cool winter season that lasts from October to February follows. The southern Beki Riverine districts receive more than 4,000 to 4,200 millimetres of precipitation annually, while the northern Beki Riverine districts receive 550 to 700 millimetres.

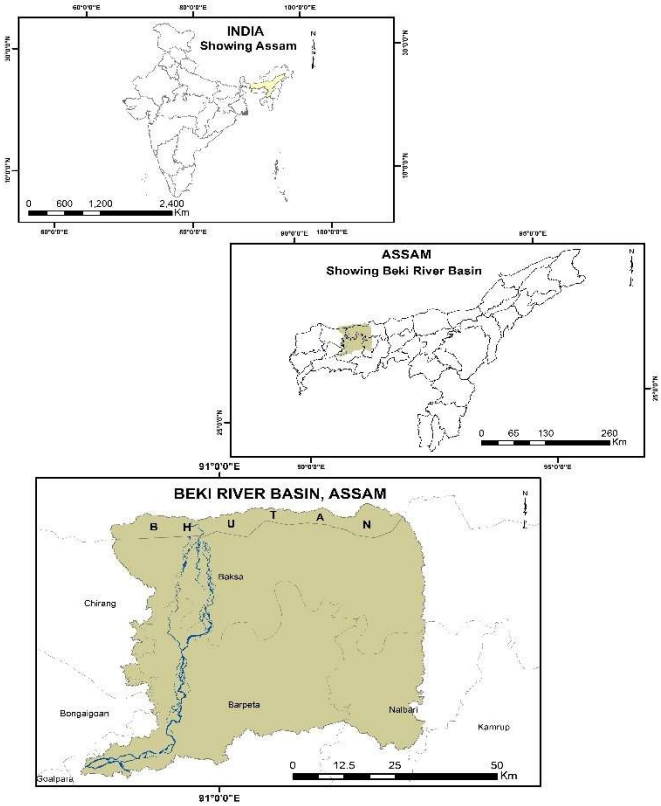

Fig: Locational map of the study area

Methodology

The review has definite objections and framework, it is expressive in nature; as the examination has made undertakings to explain about the pattern of water consumption in the study area, its impact on the villages of the study arears and for this research work targeted respondents of various age groups of both male and female.

Data collected from the different gatherings of respondents for better examination work in the venture; subsequently populace is the main wellspring of data. The sample sites have been taken in view of water scarcity/shortage and the effect of flood and data collection has been done from72 villages (based on the effect- above 50%, 25%-50% and below 25%) with the population of 1,30,565. Sample size calculator software is used to take the sample size category wise and found 423 sample for above 50%, 422 sample for 25%-50% and 423 sample for below 25% effected area. All the fundamental data might gather through talk with strategy where polls' give a guide.

The recruitment procedure of sample selection done based on the simple random sampling method. The samples were gathered from the various age groups of male and female utilizing basic arbitrary examining methods. The respondents were with different age gatherings having different language, religion, position etc.

To conducting and formulate the research, researcher has chosen descriptive research method and used interview method, provide questionnaire to the respondents for gaining information to complete the study.

The processing and summarization of crude information through the classification strategy utilizes different cartographic and quantitative strategies will be utilized to arranged guides and graphs. Deductions drawn from information examination are to be confirmed in the field for reaching last inference. The meeting plans will be investigated, confirmed, altered and organized sequentially. For coding, three expert code sheets will be ready as one for the gathered from the respondent, one more for the information gathered from the grass root pioneers. The information ought to be handled on computerized climate for example PC. In the current review both the subjective and quantitative information was dissected based on the background of the venture goals. Quantitative information is arranged and measurably examined utilizing MS Excel programming; subjective information is deciphered dependent on the data gathered from the field.

Result

Table 3.1: Frequency distribution of Age

Age Groups	Above 50%				Age Groups	25%-50%				Age Groups	Below 25%			
	Male		Female			Male		Female			Male		Female	
	No	%	No	%		No	%	No	%		No	%	No	%
0-6	44	10.42	30	7.09	0-6	51	12.09	31	7.35	0-6	37	8.75	39	9.22
6-12	21	4.96	35	8.28	6-12	34	8.06	35	8.29	6-12	43	10.16	29	6.85
12-30	43	10.16	18	4.26	12-30	49	11.61	41	9.72	12-30	35	8.27	41	9.70
30-50	82	19.38	74	17.49	30-50	78	18.48	33	7.81	30-50	72	17.02	66	15.60
Above 50	35	8.27	41	9.69	Above 50	43	10.19	27	6.40	Above 50	39	9.22	22	5.20
Total	225	53.19	198	46.81	Total	255	60.43	167	39.57	Total	226	53.43	197	46.57

About the agethe table 3.1described conveyance of understudy for the current review. It was obvious from the table that 10.42% male and 7.09% female are from 0-6 age group, 4.96% male and 8.28% female are from 6-12 age group, 10.16% male and 4.26% female are from 12-30 age group, 19.38% male and 17.49% female are from 30-50 age group and 8.27% male and 9.69% female are from above 50 years age group found in the above 50% category; followed by under the category 25%-50% expressed that 12.09% male and 7.35% female are from 0-6 age group, 8.06% male and 8.29% female are from 6-12 age group, 11.61% male and 9.72% female are from 12-30 age group, 18.48% male and 7.81% female are from 30-50 age group and 10.19% male and

6.40% female are from above 50 years age group and under the category of below 25% category found that 8.75% male and 9.22% female are from 0-6 age group, 10.16% male and 6.85% female are from 6-12 age group, 8.27% male and 9.70% female are from 12-30 age group, 17.02% male and 15.60% female are from 30-50 age group and 9.22% male and 5.20% female are from above 50 years age group

Table 3.2: Frequency distribution of type of taps

Type of taps								
Above 50%			25%-50%			Below 25%		
Sl. No	No	%	Sl. No	No	%	Sl. No	No	%
Indoor Tap	84	19.86	Indoor Tap	63	14.93	Indoor Tap	77	18.20
Watershed Tap	48	11.35	Watershed Tap	118	27.96	Watershed Tap	85	20.09
Well	31	7.33	Well	23	5.45	Well	41	9.69
Tube well	222	52.48	Tube Well	193	45.73	Tube well	181	42.79
River	38	8.98	River	25	5.93	River	39	9.23

The table explain about the types of taps used by people and from the table found that in the above 50% category 19.86% used indoor tap, 11.35% used watershed tap, 7.33% used well, 52.48% used tube well and 8.98% people used river water directly. In the 25%-50% category found the use of tap types as 14.93% indoor tap, 27.96% watershed tap, 5.45% well, 45.73% tube well and river water by 25% people.The category of below 25% showed the types of tape used by people as indoor tap 18.20%, watershed tap 20.09%, well 9.69%, tube well 42.79%, river water 9.23%.

Table 3.3: Frequency distribution of major water using appliance and their number

Above 50%						
	One time		Two times		More than two times	
Sl. No	No	%	No	%	No	%
Shower/Bath	200	47.28	156	36.88	67	15.84
Toilet	121	28.61	136	32.15	166	39.24
Hand basin	90	21.28	174	41.13	159	37.59
Bath Tub	-	-	-	-	-	-
Cloth cleaning	212	50.19	78	18.44	33	7.80
Dish cleaning	166	39.24	210	49.65	47	11.11
Cattle bath/clean	188	44.44	145	34.28	90	21.28
25%-50%						
	One time		Two times		More than two times	
Sl. No	No	%	No	%	No	%

Shower/Bath	191	42.89	147	34.83	84	19.90
Toilet	146	34.60	128	30.33	148	35.07
Hand basin	128	30.33	197	46.68	97	22.99
-Bath Tub	04	0.95	-	-	-	-
Cloth cleaning	239	56.63	129	30.57	54	12.80
Dish cleaning	198	46.91	179	42.42	45	10.66
Cattle bath/clean	198	46.91	159	37.68	65	15.40
Below 25%						
	One time		Two times		More than two times	
Sl. No	No	%	No	%	No	%
Shower/Bath	167	39.48	153	36.17	107	25.29
Toilet	181	42.79	149	35.22	93	21.99
Hand basin	115	27.19	156	36.88	152	35.93
Bath Tub	13	3.07	02	0.47	-	-
Cloth cleaning	196	46.34	142	33.57	85	20.09
Dish cleaning	169	39.95	175	41.37	79	18.68
Cattle bath/clean	206	48.70	119	28.13	98	23.17

Here the review explained the major water using appliance and their number and found that the use of water are as Shower/Bath 47.28% (one time), 36.88 (two times) and 15.84% (more than two times), Toilet 28.61% (one time), 32.15% (two times) and 39.24% (more than two times), Hand basin 21.28% (one time), 41.13% (two times) and 37.59% (more than two times), Cloth cleaning 50.19% (one time), 18.44% (two times) and 7.80% (more than two times) Dish cleaning 39.24% (one time), 49.65% (two times) and11.11% (more than two times) Cattle bath/clean 44.44% (one time), 34.28 % (two times) and 21.28% (more than two times) in the above 50% category followed by the category 25%-50% category explained that Shower/Bath 42.89% (one time), 34.83% (two times) and 19.90% (more than two times), Toilet 34.60% (one time), 30.33% (two times) and 35.07% (more than two times), Hand basin 30.33% (one time), 46.68% (two times) and 22.99% (more than two times), Bath tub 0.95% (one time) Cloth cleaning 56.63% (one time), 30.57% (two times) and 12.80% (more than two times) Dish cleaning 46.91% (one time), 42.42% (two times) and10.66% (more than two times) Cattle bath/clean 46.91% (one time), 37.68% (two times) and 15.40% (more than two times) used and in the below 25% category found that Shower/Bath 39.48% (one time), 36.17% (two times) and 25.29% (more than two times), Toilet 42.79% (one time), 42.79% (two times) and 35.22% (more than two times), Hand basin 27.19% (one time), 36.88% (two times) and 35.93% (more than two times), Bath tub 3.07% (one time), 0.47% (two times), Cloth cleaning 46.34% (one time), 33.57% (two times) and 20.09% (more than two times) Dish cleaning 39.95% (one time), 41.37% (two times) and18.68% (more than two times) Cattle bath/clean 48.70% (one time), 28.13% (two times) and 23.17% (more than two times) water used.

Table 3.4: Frequencydistribution of personal hygiene

Personal hygiene											
Above 50%				25%-50%				Below 25%			
Sl. No	Yes	No		Sl. No	Yes	No		Sl. No	Yes	No	NA
					No (%)	No (%)	NA (%)		Yes (%)	No (%)	No (%)
	No (%)	No (%)	NA (%)								
Bathroom	196 46.81	98 23.22	129 30.57	Bathroom	169 40.05	123 29.15	130 30.81	Bathroom	208 49.17	101 23.88	114 36.17
Sanitary toilet	102 24.11	203 48.10	118 27.96	Sanitary toilet	156 36.97	103 24.41	163 38.62	Sanitary toilet	191 45.15	153 36.17	79 18.68
Washroom	289 68.32	76 18	57 13.51	Washroom	291 68.96	45 10.66	86 20.38	Washroom	345 81.56	22 5.20	56 13.24
Water Filter/purifier	197 46.57	122 28.91	104 24.64	Water Filter/purifier	186 44.08	98 23.22	138 32.70	Water Filter/purifier	309 73.05	49 11.58	65 15.37
Use of soap/hand wash	201 47.52	89 21.09	133 31.52	Use of soap/hand wash	214 50.71	65 15.40	143 33.89	Use of soap/hand wash	315 74.47	78 18.44	30 7.09

From the investigation found that 46.81% used bathroom and 23.22% not used, Sanitary toilet used by 24.11% and 48.10% not used, washroom used by 68.32% whereas 18% not used, water filter/purifier used by 46.57% and 28.91% not used and the use of soap/handwash by 47.52% whereas 21.09%. not used among the category of above 50% category. The category 25%-50% showed that 40.05% used, 29.15% not used bathroom, 36.97% used, 24.41% not used Sanitary toilet, washroom 68.96% used, 10.66% not used, Water filter/purifier used by 44.08%, not used 44.08% and the use of soap/handwash 47.52% and not used by 21.09%. Under the category of below 25% found that the use of bathroom is 49.17%, not used by 23.88%, use of sanitary toilet is 45.15% and 36.17% not used, washroom used by 81.56%, 5.20% not used, water filter/purifier used by 73.05%, 11.58% not used and the soap/handwash used by 74.47%, 18.44% not used.

Table 3.5: Frequency distribution of major source of drinking water

Type of sources								
Above 50%			25%-50%			Below 25%		
Sl. No	No	%	Sl. No	No	%	Sl. No	No	%

Pipe water/supply water	40	9.46	Pipe water/supply water	45	10.66	Pipe water/supply water	73	17.26
Well	31	7.33	Well	19	4.50	Well	62	14.69
Tube Well	222	52.48	Tube well	252	59.72	Tube well	162	38.30
Bottle/Dram	58	13.71	Bottle/Dram	62	14.69	Bottle/Dram	89	21.04
Store water	34	8.04	Store water	19	4.50	Store water	32	7.57
River water	38	8.98	River water	25	5.92	River water	05	1.18

Regarding major source of drinking water in the study found from the three categories are as in the above 50% category found the source of major drinking water are Pipe water/supply water 9.46%, Well 7.33%, Tube Well 52.48%, Bottle/Dram 13.71%, Store water 8.04%, River water 8.98%. in the category 25%-50% found Pipe water/supply water 10.66%, Well 4.50%, Tube Well 59.72%, Bottle/Dram 14.69%, Store water 4.50%, River water 5.92% and in the below 25% category found Pipe water/supply water 17.26%, Well 14.69%, Tube Well 38.30%, Bottle/Dram 21.04%, Store water 7.57%, River water 1.18%.

Table 3.6: Frequency distribution of daily water consumption

Daily water consumption								
Above 50%			25%-50%			Below 25%		
Sl. No (in litter)	No	%	Sl. No (in litter)	No	%	Sl. No (in litter)	No	%
Below 35	54	12.77	Below 35	64	15.17	Below 35	80	18.91
36-55	89	21.04	36-55	96	22.75	36-55	101	23.88
56-75	156	6.88	56-75	163	38.63	56-75	19	2.86
76-100	83	19.62	76-100	61	14.45	76-100	69	16.31
Above 101	41	9.69	Above 101	38	9.00	Above 101	34	8.04

During the study about the daily water consumption found from the ground(household) data that the category above 50% reported that 12.77% used below 35 litters, 21.04% used 36-55 litters, 6.88% used 56-75 litters, 19.62% used 76-100 litters and 9.69% used above 101 litters. 15.17% used below 35 litters, 22.75% used 36-55 litters, 38.63% used 56-75 litters, 14.45% used 76-100 litters and 9% used above 101 litters in the category of 25%-50% and the category below 25% showed that 18.91% used below 35 litters, 23.88% used 36-55 litters, 2.86% used 56-75 litters, 16.31% used 76-100 litters and 8.04% used above 101 litters.

Table 3.7: Frequency distribution of water supply service

Quality (Above 50%)	Above 50%										
	No (%)	Colour (No &%)			Test (No &%)			Pressure (No &%)			
		Normal	Other	Turbidity	Yes	No	NA	L	M	H	NA
Excellent	92 21.35	251 59.33	121 28.61	51 12.06	174 41.13	93 22.99	156 36.88	35 8.27	223 52.72	63 14.89	102 24.11
Very Good	111 26.24										
Good	156 36.88										
Poor	46 10.87										
Very Poor	18 4.26										

In the take a look at location of the category of above 50% found the water supply service quality as 20.35 percent excellent, 26.24 percent very good, 36.88 percent good, 10.87 percent poor and 4.26 percent v. poor respectively. From the table found that 59.33% people observed normal colour, 28.61% sated they observed other colour and the turbidity found in the area is 12.06 percent and about the test it was found that 41.13% respondent stated that the supply water service tested their supply water and the maximum 52.72% stated that the water flow pressure was medium.

Quality (25%-50%)	25%-50%											
	No (%)	Colour (No &%)				Test (No & %)			Pressure (No & %)			
		Normal	Other	Turbidity	NA	Yes	No	NA	L	M	H	NA
Excellent	88 20.85	263 63.32	25 5.92	34 8.06	100 23.70	171 40.52	98 23.22	153 36.26	99 23.46	218 51.66	78 18.48	27 6.40
Very Good	135 31.99											
Good	160											

	37.91											
Poor	276.40											
Very Poor	122.85											

The 25%-50% category stated that 20.85 percent excellent, 31.99 percent very good, 37.91 percent good, 6.40 percent poor and 2.85 percent v. poor water supply service; whereas found that 63.32% normal water colour, 5.92% other, 8.06% turbidity and 23.70% respondents have no idea. 40.52% stated that supply water was tested; 51.66% observed that the supply water pressure is medium, 18.48% high and 23.46% low.

Quality (Below 25%)	Below 25%											
	No (%)	Colour (No &%)				Test (No & %)			Pressure (No & %)			
		Normal	Other	Turbidity	NA	Yes	No	NA	L	M	H	NA
Excellent	85 20.14	235 55.55	59 13.95	23 5.44	106 25.06	197 46.57	79 18.68	147 34.75	68 16.07	185 43.74	82 19.39	88 20.80
Very Good	145 34.24											
Good	161 38.06											
Poor	18 4.26											
Very Poor	14 3.30											

The below 25% category showed that 20.14percent excellent, 34.24 percent very good, 38.06 percent good, 4.26 percent poor and 3.30 percent v. poor water supply service. whereas found that 55.55% normal water colour, 13.95% other, 5.44% turbidity and 25.06% respondents have no idea. 46.57% stated that supply water was tested; 43.74% observed that the supply water pressure is medium, 19.39% high and 16.07% low.

Table 3.8: Frequency distribution of degree of regularity of water supply

Degree of regularity								
Above 50%			25%-50%			Below 25%		
Sl. No	No	%	Sl. No	No	%	Sl. No	No	%

Morning	108	25.63	Morning	125	29.55	Morning	134	31.68
Afternoon	94	22.22	Afternoon	98	23.22	Afternoon	63	14.89
Evening	178	27.90	Evening	111	26.24	Evening	116	27.42
Late Evening	76	17.97	Late Evening	43	10.17	Late Evening	69	18.31
Night	10	2.36	Night	21	4.96	Night	25	5.91
Can't say	17	4.02	Can't say	25	5.91	Can't say	16	3.78

During the study about the degree of regularity found from the ground(household) data that the category above 50% reported that 25.63% morning, 22.22% afternoon, 27.90% evening,17.97% late evening and 2.36% night. 25.63% morning, 22.22% afternoon, 27.90% evening,17.97% late evening and 2.36% night. 29.55% morning, 23.22% afternoon, 26.24% evening,10.17% late evening and 4.96% night foundin the category of 25%-50% and the category below 25% showed that 31.68% morning, 14.89% afternoon, 27.42% evening,18.31% late evening and 5.91% night respectively.

Table 3.9: Distribution of number of tips taken by households for collection of water from outside the house compound

Number of tips								
Above 50%			25%-50%			Below 25%		
Sl. No	No	%	Sl. No	No	%	Sl. No	No	%
Below 6	98	23.17	Below 6	91	21.56	Below 6	89	21.04
7-10	114	26.95	7-10	119	28.20	7-10	123	29.08
11-14	121	28.61	11-14	126	29.86	11-14	131	30.97
15-18	65	15.36	15-18	59	13.98	15-18	61	14.42
Above 18	25	5.91	Above 18	27	6.40	Above 18	19	4.49

The examination in the study area found different frequency distribution of number of tips for water collection in the three divided category. In the category above 50% found 23.17% people carry water under six tips followed by 26.95% collected water in 7-10 tips, 28.61% in 11-14 tips, 15.36% in 15-18 tips and 5.91% people collected water in more than 18 tips.21.56% people carry water under six tips followed by 28.20% collected water in 7-10 tips, 29.86% in 11-14 tips, 13.98% in 15-18 tips and 6.40% people collected water in more than 18 tips found under the category of 25%-50% and the below 25% category highlighted 21.04% people carry water under six tips followed by 29.08% collected water in 7-10 tips, 30.97% in 11-14 tips, 14.42% in 15-18 tips and 4.49% people collected water in more than 18 tips.

Table 3.10: Distribution of time duration of water from outside of their house

Time duration								
Above 50%			25%-50%			Below 25%		
Sl. No	No	%	Sl. No	No	%	Sl. No	No	%
Below 30 mints	153	36.17	Below 30 mints	171	40.52	Below 30 mints	165	39.01
30-45 mints	139	32.86	30-45 mints	136	32.23	30-45 mints	144	34.04
45-60 mints	96	22.70	45-60 mints	89	21.09	45-60 mints	93	21.99
More than 60 mints	35	8.27	More than 60 mints	26	6.16	More than 60 mints	21	4.96

The study also focused on the time duration for water collection from the outside of the house and found that36.17% people collected within 30 mints followed by 32.86% collected water in between 30-45 mints, 22.70% in between 45-60 mints, 8.27% in More than 60 mints; the 25%-50% category found that 40.52% collected water in below 30 mints, 32.23% collected water in between 30-45 mints, 21.09% collected water in between 45-60 mints and 6.16% collected water in more than 60 mints and 39.01% respondent collect water within below 30 mints, 34.04% collect water in within 30-45 mints, 21.99% collect water within 45-60 mints and 4.96% respondent collect water in more than 60 mints.

3.11 Frequency distribution of opinion of households towards rainwater harvesting in the study area

Households having awareness about rainwater harvesting								
Above 50%			25%-50%			Below 25%		
Sl. No	No	%	Sl. No	No	%	Sl. No	No	%
Yes	106	25.06	Yes	201	22.03	Yes	216	22.93
No	196	46.34	No	93	47.63	No	97	51.06
No Answer	121	28.60	No Answer	128	30.33	No Answer	110	26

That Rainwater harvesting can play an important role inmeeting the water supply challenges in rural sector.However, the awareness about rainwater harvesting in the Beki River basin is inadequate and only25.06 % households showed awareness about the rain-water harvesting technology, whereas 46.34 % house-holds do not have any awareness about the technology, 28.60% households have no idea found from the category of above 50%. 22.03 % households showed awareness about the rain- water harvesting technology, whereas 47.63 % house-holds do not have any awareness about the technology, 30.33% households have no idea found from the

category of 25%-50%. 22.93 % households showed awareness about the rain- water harvesting technology, whereas 51.06 % house-holds do not have any awareness about the technology, 26% households have no idea found from the category of 25%-50%. (Table 11).

Limitations of study

The field study was conducted during the winter season therefore excluding the summer part of the year when consumption variations occur. Besides, the data collection approach is cross-sectional and cannot provide information about the evolution of house- holds' opinions and behaviours over time, e.g., between winter and summer seasons. The linguistic differences between the designed questionnaire (English) and the administered questionnaire (vernacular language Assamese) may have generated errors when translating the questions directly to the respondents during the interviews. Moreover, the quality of data pertaining to self-reported information on household income from respondents may include an error of about 25 % in actual income and income reported by respondents to the interviewer.

Conclusions and suggestions

High water consuming economic activities and population growth are responsible for declining per capita water availability in the world. Increased consumption by the privileged class puts further pressure on this diminishing natural resource. A systematic augmentation of water supply in rural areas would check the high degree of migration from rural areas to urban centres in search of livelihood. Overall, the majorobservations drawn from the study are: (a) Women are the principal water collectors in the village; (b) the availability and mode of use of water varies across the various socio-economic classes within the study area. Surprisingly, however, the difference is not very high; (c) Water consumption in the Beki River basin is far lower than the norms laid down by WHO standards. Not to mention, in comparison to other rural areas in Asia, the consumption pattern in village is also deficient. The lower domestic water consumption pattern is presumably attributed to deficient water supply which is not keeping pace with population growth and increasing need of users; (d) Twenty-four-hour water supply through taps is a dream for majority of households in the village. The study reveals that very few households in the village get 24 h water supply. The erratic and limited duration of supply of water in the village is a common phenomenon. This has forced the villagers to rely on other sources of water supply namely, private tube wells, hand pumps and private vendors who supply water through tankers. This in turn is leading to emerging water markets in the village and these private water vendors have their hey-days during the summer season. Results of this study also suggest some areas of further research. First, considering that distance is the most important factor influencing the choice of water sources in the examined area, where one should establish improved water facilities in the village to minimize travel distance for all potential users.

Second, there is a near absence of conservation practices in the village. Water conservation is important in ensuring a sustainable future for rural households especially in arid and semi-arid regions. Rain water harvesting methods, which have a large potential to solve emerging water crises are not known to a majority of people in the village. The analysis also revealed that more than 90 % of respondents admitted they had never been instructed on the judicious use of water,

and therefore do not consciously practice any form of conservation. Research and concerted efforts must be directed toward developing economically feasible, culturally acceptable and environmentally sound ways of increasing water availability in the dry season by conserving it during the rainy season is important in the study area. This will reduce the stress of searching for water during the dry season. A good place to start this in the reviewed area would be to educate people on the ways and benefits of water conservation. Over theyears, the people of the semi-arid region in India have adapted their water use to the changing availability of water. In the process of this adaptation, these populations have accumulated valuable information that ought to be incorporated into more formal analyses of sustainable development. Therefore, an awareness campaign about the judicious use of water highlighting various domestic activities can play a big role in conserving water. Third, it is also important to find more hygienic ways of storing water than earthen pots, since long storage may encourage the spread of water borne diseases. Improvements in this direction will reduce the prevalence of water-related diseases in the reviewed area.

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