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APPENDIX – A

(i). Interview Schedule - English

An Interview Schedule to Elicit Information on
"Management Practices of Water Conservation in Domestic Sector – Water Supply, Storage and Water Consumption Behaviour "

I. GENERAL INFORMATION

a. Name of the Interviewee:
b. Address :

c. Designation :

d. Contact number :

II. SOCIO-ECONOMIC BACKGROUND OF THE FAMILY

1. Type of family:
   Nuclear Joint Extended
2. Size of the family :
3. Details of family members:

S.No	Relationship	Age	Qualification	Occupation

4. Income of the family: Approximately (in Rupees)
   Less than 10,000 10,000 – 20,000 20,000 - 30,000
   30,000 – 40,000 more than 40,000

III. PROPERTY DETAILS

5. Type of ownership
   Own house Rented house Lease house
6. Type of house
   Independent house Portioned house Row house
7. Number of floors constructed
   Only ground floor G + 1 G + 2
8. Total area of the house
   less than 500 sqft 500 – 900 sqft 900 – 1300 sqft
   1300 – 1700 sqft more than 1700 sqft
9. Period of living in that particular area
   less than 1yr 1 – 3years 3 – 5 years 5 – 7 years
   7 – 9 years more than 10 years
10. Zonal Division
    North South East West Central Zone

North : Ward No: 1 2 3 4 26 27 28 29 30 31 38 39 40 41 42 43 44 46 47 55
South : Ward No: 76 77 78 79 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
East : Ward No: 32 33 34 35 36 37 56 57 58 59 60 61 62 63 64 65 66 67 69 75
West : Ward No: 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Central : Ward No: 25 45 48 49 50 51 52 53 54 68 70 71 72 73 74 80 81 82 83 84

IV. INFORMATION ON WATER DISTRIBUTION PROCESS

11. Sources of water:

Siruvani Pilloor I Pilloor II Bhavani

12. Type of water:

• Soft Water
- Owned water connection
- Common street connection
- Borewell / ground water
- Bottled water for drinking

• Hard Water
- Owned water connection
- Common street connection
- Buying from outside for activities other than drinking

Rain water getting from friends/ neighbours/ relation

13. The position of the distribution tap

at the road level

reduced below the GL – @ _____

into the sump

increased above the GL - @ _____

14. Frequency of water supply / purchase of water

Type of wate	***Frequency***													
	Daily	Alternate days		3	4	5	6	7	8	9	10	10-15 days	15–20 days	> 20 days
Water Supply														
Soft Water														
Hard Water														
Water Purchased														
For Drinking (Bottled)														
For other activities other than drinking														

15. Frequency of water supply during seasonal variations

Seasons	***Frequency***													
	Type of water	Daily	Alternate days	3	4	5	6	7	8	9	10	10-15 days	15–20 days	> 20 days
Durind summer (when demand is more)	***Soft Water***													
	Hard Water													
During other seasons (when supply exceeds Demand)	***Soft Water***													
	Hard Water													

16. Water is distributed during

		Morning	Afternoon	Evening	Night	Late night
Soft . Water	Always					
	Sometimes					
	Never					
Hard Water	Always					
	Sometimes					
	Never					

17. Sufficiency of the collected water:

Yes, it is sufficient Some times not sufficient Not adequate

18. How often do you prefer water to be supplied: Once in

2 days 3 4 5 a week twice a week

19. When do you experience inadequate situation

guests at home | seasonal changes | regular cleaning
water is supplied once in 20 days | because of more number of family members
no such situation | during family functions | neglegence of fetching
no intimation about the supply | Maintenance

20. Level of satisfaction derived (in terms of quality and quantity) from corporation water supply

Seasons	***Level of Satisfaction***								
	Type of water	**Quality**				**Quantity**			
		Highly Satisfied	Satisfied	Moderately satisfied	Not satisfied	Highly satisfied	Satisfied	Moderately satisfied	Not satisfied
During summer (when demand more)	***Soft Water***								
	Hard Water								
During other seasons (when supply exceeds Demand)	***Soft Water***								
	Hard Water								

21. During shortage of water, how do you manage the situation

Procurement from outside | by fetching from common public taps
from relations house/ neighbours | use bore well
supply of hard water | no such situation

22. Type of filtration adopted for drinking water

Boiling | Straining | Sedimentation | any other method

23. What are the difficulties you face during the supply of water:

a)
b)
c)

V. COLLECTION (FETCHING) AND STORAGE PRACTICES OF WATER

24. Methods of collecting water: (Tick ☑ the applicable)

Type of water stored		Sump	Over head Tank	Collected in vessels						Collected in containers, Barrels and Drums
				Materials						
				SS	Brass	Copper	Plastic	Mud pot	Cement tubs	
Soft water	Drinking									
	Other uses									
Hard water										
Buying from Outside for activities other than drinking										
Bottled water for drinking										

Others specify ……

a) Number of sumps provided for water storage:

Soft Water: 1 2 3 4
Soft & hard water: 1 2 3 4
Hard Water: 1 2 3 4

b) Capacity of sump: (Sump 1)
Less than 3,000 ltrs 3000 – 6000 ltrs
more than 6000 ltrs others specify
Capacity of sump: (Sump 2)
Less than 3,000 ltrs 3000 – 6000 ltrs
more than 6000 ltrs others specify

c) Frequency of cleaning the sump
once in week once in a month once in 2 months once in 3 months
once in 6 months once in a year once in 2 years not yet cleaned
whenever required others specify……..

d) Type of over head tank
Cement syntex tank

e) Capacity and number of over head tanks

Type of water	Number of overhead tanks					Capacity of storage (in ltrs)				
	0	1	2	3	More than 3	500	750	1000	2000	More than 2000
Hard water										
Soft water										
Borewell water										
For all together Not for specific water										

f) Cleaning the over head tank
once in week once in a month once in 2 months once in 3 months
once in 6 months once in a year once in 2 years not yet cleaned
whenever required others specify……..

g) Cleaning the overhead tank was performed by
own engage any person others specify ……...

h) If person for cleaning has been outsourced then the usual amount payable for their service Rs……..(approximately)

i) Supply of water from the distribution source to the over head tank by
Pumping method Gravity method Any other method specify……

j) Water is collected and stored
Only to the sump and overhead only stored in pots and vessels
in sump, overhead and containers

k) Distance covered by the household in fetching the water from the source

Type of water	Distance Covered			
	< 1 mtr	1 – 5 mtrs	6 – 10 mtrs	> 10 mtrs
Corporation - Soft water				
Corporation - Hard water				

l) Distance includes steps
less than 5 no of steps 10 – 20 steps more than 20 steps no steps

m) For how many hours water is supplied?

Type of water	Duration of water supply				spent on fetching water			
	less than 1 hr	1-2 hrs	2–3 hrs	others specify	less than 1 hr	1-2 hrs	2–3 hrs	Do not Fetch water
Corporation - Soft water								
Corporation - Hard water								

n) Tools involved in the process of fetching water
Hose Pot Others specify

o) Person involved in fetching water
Home maker head of the family maid son any others specify……..

25. Kind of vessels used for water storage
Stainless Steel Brass Copper Aluminium
Plastic mud pot Others specify ……..

26. Frequency of cleaning the vessels used for water storage:
Daily once in 2 days Once in 5 days once in 7 days
once in 10 days once when water has been supplied

27. For how many days do you store water in the containers?
upto 5 days upto 10 days upto 15 days till the next water supply

28. What will you do with the old water when the water is supplied next time
Throw it away Reuse it Bathing
Gardening washing cloths washing utensils
washing vehicles once old water is consumed will fetch water
use the old water first pour into the sump again no storage
no old water is left If reused, how:

29. A full overhead tank of water would be consumed within

No of tanks	Capacity of the tank						Number of days taken for consumption				
	500	750	1000	1500	2000	< 2000	1 day	1 – 2 days	2 – 3 days	more than 3 days	Others specify
1											
2											
3											
4											

VI. CONSUMPTION OF WATER / CONSUMPTION PROFILE:

30. Quantity of consumption:

a) Amount of water (in litres) used as per the records in this year

Reading	Jan 2017	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total Ltrs
From													
To													
Ltrs consumed													
Amount Paid(Rs)													

b) Water Pricing:
Flat Basis - Amount paid…….. Metered – Amount paid……..
Yearly Bi monthly Quarter yearly
Half-yearly Monthly No proper frequency

c) If water has been procured from outside, then the quantity
Lorry water : Yes No Bottled water : Yes No

Water that has been procured from outside				
Quantity of Water (in ltrs)	Lorry water		Bottled water	
	Frequency	Amount Paid	Frequency	Amount Paid
20				
500				
1000				
1500				
2000				

Any others specify …….

31. Handling of water to carry out the following activities:

a) Supply of soft water inside the house

In kitchen — Sink; Separate drinking water

In bathrooms — For hand wash

In toilets — In outdoors

Garden — washing area

b) Water used for a variety of activities: (Tick ☑ the applicable)

Activity	Type of water used								
	Soft Water			Hard Water			Bore well water		
	Always	**Some times**	**Never**	**Always**	**Some times**	**Never**	**Always**	**Some times**	**Never**
Cooking									
Drinking									
Other kitchen activity									
Washing clothes									
Bathing									
Toilets									
Moping the house									
Hand wash									
Gardening									
Outside cleaning work									

c) Quantity of water used to carryout activities: (Tick ☑ the applicable)

Activity	Type of water used – per day (in Ltrs) No of persons: ……												
	1-5	**6-10**	**11-15**	**16-20**	**21-25**	**26-30**	**31-35**	**36-40**	**36-40**	**41-45**	**46-50**	**51-55**	**56-60**
Cooking													
Drinking													
Other kitchen activity													
Washing clothes													
Bathing													
Toilets													
Moping the house													
Hand wash													
Gardening													
Outside cleaning work													

d) Quantity of water used is maximum during:

4-6 am	6-8am	8-10am	10-12am	12-2 pm	2-4 pm	4-6 pm	6-8 pm	8-10 pm	10pm-4pm

e) Do you have maid at home ?
Yes No

f) Number of maids?
1 2 3 others specify ……..

g) Works of maid include
Cooking - ….. washing utensils - ….. washing clothes - ….. moping - ……
Outside work / gardening - ……. child care patients care

VII. CONTRIBUTION OF HOUSEHOLD APPLIANCES IN THE USE OF WATER

32. What is your opinion that household appliances works more efficient than the maids/ ourself on the point of water conservation.
Yes it is No it is not not always

33. List of household appliances which works using water

Appliance	Brand	Fully Automatic/semi	Age
• Washing machine			
• Dish Washer			
• Wet vacuum Cleaner			
• Water purifier			

34. Method of washing cloths: Hand washing machine washing laundry outside

35. Frequency of loading the washing machine:
Daily → No of Loading ⟶ Once
once in two days ⟶ Twice
once in a week ⟶ Thrice
others specify ⟶ more than three

36. Type of water purifier used:
a) RO UV UF Candle filter Activated carbon
b) Only for drinking purposes full house

37. How do you manage the waste water from purification system
discharged into drainage watering plants any other purpose specify…….
No water wastage from my purifier

VIII. WATER CONSERVATION ANALYSIS

38. Are you aware of the term water conservation?
Yes No Heard somewhere

39. Are you using any water conservation products like
Water sprayers attached to taps Dual flush cistern
Water flow control shower heads Over flow control devices
Using shower cans for plants in sump, over head tank
Others specify …….....

40. Are you practicing any water conservation methods like
Rain water harvesting Reusing of water Recycling of water
Limiting the use of vessels while working Using kitchen waste water for gardening
Using RO waste water reusing for floor cleaning
Others specify ……

41. Installation of Rain water harvesting:

a) Do you have rain water harvesting in your house?
   Yes No If no, reason…….....

b) Do you have the habit of saving rain water?
   Yes No If yes, how …….....
   If no, reason ……

c) Method of saving rain water:
   In sump In vessels Underground pit Not Applicable

d) How do you use the collected rain water:
   Drinking Washing cloths Washing vessel Cleaning indoor / oudoors floors
   Gardening Bathing Washing vehicle Cooking

42. What are the activities by which water has been wasted in our daily life

S.No	Activity	Frequently	Moderately	Rarely	Never
1	Overflow of overhead tank				
2	While washing Vehicles				
3	Taking shower bath				
4	Taking long bath				
5	During brushing				
6	While cleaning utensils (opened flow of water)				
7	While shaving				
8	Traditional practices: Keep on washing outdoors Others ……				
9	Water leakages				
10	Flushing toilets				
11	Waste water from water purification systems				
12	Others specify				

IX. INTEREST SHOWN IN INTERVENTION

43. Apart from the above water conservation techniques, what are your valuable view points that can be followed inorder to reduce wastage

Mentally we should be water minded in all the activies carrired out
Being consious about water wastage
Use borewell/ hard water for outdoor/ gardening works
Water should be conserved
Washing by hands consume less water when compared to wm
Waste water from the kitchen should be made reach the trees in our houses for it can be Reused
Water can be reused
Recycling of water can be done
Rain water should be saved and used properly
By proper planning, distribution and managing practices
Public taps should be closed while not using
Should educate children first to conserve water
Individual attitude should be changed to conserve water
Washing utensils, vehicles, legs in public taps should be prohibited
Installing automation system in filling water in overhead tanks
Reduce the use of water while bathing
Rain water harvesting should be incorporated in every house

Advanced technology - shifting to front loading conserves water
Limiting the use of water
Supply of water should be measured
Leakages in taps shd be attended immediately
More reusing methods should be adopted
Over flowing of over head tank should be avoided
Use as per our need
Better to avoid having maids
Old appliances must be replaced

44. What are your suggestions to carry out an effective water management practices at home?

Control exploitation of ground water in house
Monitor the water consumption pattern of each area/ household
Water should be conserved for better tomorrow
Rain water should be harvested, so that borewell quality can be improved
Waste water from the kitchen should be made reach the trees in our houses for it can be reused
Low flow taps can be used
While washing utensils, collect water in a tub for washing
High income group households consumes more and pay more when compared to medium and low income categories
Kitchen vessels should be soaked so that it would be easy for washing and consumes less water
Kitchen waste water+rice wshing would be used for bio-gas plants
Being consious about water wastage
Awareness of water usage for each activity would reduce wastage
A change in the design of water inlets
People attitude towards using water should be changed
Strong government policies
Specific quantity of water supply acc to no of persons in a house
Maintainance of plumbing fixtures and frequent checking for leakages
Washing by WM can reduce water consumption compared to hand wash
Provisions should be made to reuse and recycle water
Not using shower while bathing use a bucket and bath
Use small size cupsin order to reduce water wastage
In apartments sewage treatment plants(recycling) can be brought ad mandatory to reduce wastage
Cost effective water flow control in taps
Outdoors can be moped instead of washing
Reduce water washing vehicles daily
Too much of modern facilities leads to more wastage of water
wiping the vehicles instead of wasting water using hose
Minimum bath time
Reducing utensils
Should close the tap properly. There might be dripping of water leads to water wastage
Don’t bath in running tap. Use water in bucket which saves water

45. What is your comments on the water scheme 24*7 supply in Coimbatore?

Our usage behaviour is not going to change
It’s a revenue generating scheme
We have to pay the money whatever we uses
Increases wastage
Happy to have this type of system
No idea

Already we have sufficient supply of water
Individual using behaviour should not be change even there is plenty of water
Not in our area
First we will see what happens

46. Are you interested / willing to know more about conservation and management activities

Yes No Not now

47. Will you participate in any intervention campaigns if conducted ?

Yes No Not now

APPENDIX – A

(ii). Interview Schedule - Tamil

தகவல் பெற ஒரு நேர்காணல் அட்டவணை தமிழில்

"Exploration of Domestic Water Management Practices and Paradigm Shift using IoT Enabled AI System for Devising Water Conservation in Ingenious Homes."

I. பொதுவான தகவல்

a. நேர்காணல் செய்பவரின் பெயர் :
b. முகவரி :
c. பதவி :
d. தொடர்பு எண் :

II. குடும்பத்தின் சமூக-பொருளாதார பின்னணி

a) குடும்ப வகை:
அணு குடும்பம் கூட்டுக் குடும்பம் விரிந்த குடும்பம்

b) குடும்பத்தின் அளவு:

c) குடும்ப உறுப்பினர்களின் விவரங்கள்

எண்	உறவு	வயது	தகுதி	தொழில்

d) குடும்பத்தின் வருமானம்: தோராயமாக (ரூபாயில்)
ரூ10,000 க்கும் குறைவானது ரூ10,000 – ரூ 20,000 ரூ 20,000 – ரூ 30,000
ரூ 30,000 – ரூ 40,000 ரூ 40,000 க்கு மேல்

III. சொத்து விவரங்கள்

e) உரிமையின் வகை
சொந்த வீடு வாடகை வீடு குத்தகை வீடு

f) வீட்டின் வகை
சுதந்திர வீடு பகுதி வீடு வரிசை வீடு

g) கட்டப்பட்ட மாடிகளின் எண்ணிக்கை
தரை தளம் மட்டும் G + 1 G + 2

h) வீட்டின் மொத்த பரப்பளவு
500 சதுர அடி 500 – 900 சதுர அடி 900 – 1300 சதுர அடி
1300 – 1700 சதுர அடி 1700 சதுர அடிக்கு மேல்

i) குறிப்பிட்ட பகுதியில் வாழும் காலம்
1 வருடத்திற்கும் குறைவானது 1 - 3 ஆண்டுகள்
3 - 5 ஆண்டுகள் 5 - 7 ஆண்டுகள்
7 - 9 ஆண்டுகள் 10 ஆண்டுகளுக்கு மேல்

j) மண்டல பிரிவு
வடக்கு தெற்கு கிழக்கு மேற்கு மத்திய
வடக்கு: வார்டு எண்: 1 2 3 4 26 27 28 29 30 31 38 39 40 41 42 43 44 46 47 55
தெற்கு : வார்டு எண்: 76 77 78 79 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
கிழக்கு : வார்டு எண்: 32 33 34 35 36 37 56 57 58 59 60 61 62 63 64 65 66 67 69 75
மேற்கு : வார்டு எண்: 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

மத்திய : வார்டு எண்: 25 45 48 49 50 51 52 53 54 68 70 71 72 73 74 80 81 82 83 84

IV. நீர் விநியோக செயல்முறை பற்றிய தகவல்

a) நீர் ஆதாரங்கள்:
சிறுவாணி பில்லூர் I பில்லூர் II பவானி

b) நீர் வகை:

• மென்மையான நீர்
சொந்தமான தண்ணீர் இணைப்பு
பொதுவான தெரு இணைப்பு
போர்வெல் / நிலத்தடி நீர்

குடிப்பதற்கு பாட்டில் தண்ணீர்

• கடின நீர்
சொந்தமான தண்ணீர் இணைப்பு
பொதுவான தெரு இணைப்பு
குடிப்பதைத் தவிர வேறு நடவடிக்கைகளுக்கு வெளியில் இருந்து வாங்குதல்
மழை நீர் நண்பர்கள் /அண்டை வீட்டார் / உறவினர்களிடமிருந்து பெறுதல்

c) விநியோக குழாயின் நிலை
சாலை மட்டத்தில்
GL க்கு கீழே குறைக்கப்பட்டது
சம்ப்பிற்குள்
GL ஐ விட அதிகரித்துள்ளது

d) நீர் விநியோகம் / தண்ணீர் வாங்கும் நாட்களின் எண்ணிக்கை

நீர்	***தண்ணீர் வாங்கும் நாட்களின் எண்ணிக்கை***													
	தினசரி	**மாற்று நாட்கள்**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**10-15**	**15–20**	**> 20**
தண்ணிர் விநியோகம்														
மென்மையான நீர்														
கடின நீர்														
தண்ணீர் வாங்கப்பட்டது														
குடிப்பதற்காக (பாட்டில்)														
மற்ற செயல்பாடுகளுக்கு குடிப்பதைத் தவிர														

e) பருவகால மாறுபாடுகளின் போது நீர் விநியோகம் செய்யப்படும் நாட்களின் எண்ணிக்கை

பருவங்கள்	***தண்ணீர் வாங்கும் நாட்களின் எண்ணிக்கை***													
	தண்ணீர் வகை	**தினசரி**	**மாற்று நாட்கள்**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**10-15**	**15–20**	**> 20**
கோடை காலத்தில் (தேவை இருக்கும்போது மேலும்)	மென்மையான நீர்													
	கடின நீர்													
மற்ற போது பருவங்கள் (சப்ளை செய்யும் போது மீறுகிறது கோரிக்கை)	மென்மையான நீர்													
	கடின நீர்													

f) நாளின் எந்த நேரத்தில் தண்ணீர் விநியோகிக்கப்படுகிறது

		காலை	மதியம்	மாலை	இரவு	லேட் நைட்
மென்மையான நீர்	எப்போதும்					
	சில சமயம்					
	ஒருபோதும் இல்லை					
கடின நீர்	எப்போதும்					
	சில சமயம்					
	ஒருபோதும் இல்லை					

g) சேகரிக்கப்பட்ட நீரின் போதுமான அளவு:
ஆம், இது போதுமானது சில நேரங்களில் போதுமானதாக இல்லை
போதுமானதாக இல்லை

h) எவ்வளவு அடிக்கடி தண்ணீர் வழங்க விரும்புகிறீர்கள்: ஒருமுறை
2 நாட்கள் 3 4 5
ஒரு வாரம் வாரத்திற்கு இரண்டு முறை

i) நீங்கள் எப்போது போதுமான சூழ்நிலையை அனுபவிக்கிறீர்கள்
வீட்டில் விருந்தினர்கள் பருவகால மாற்றங்கள் வழக்கமான சுத்தம்
குடும்ப உறுப்பினர்கள் அதிக எண்ணிக்கையில் இருப்பதால் 20 நாட்களுக்கு ஒருமுறை தண்ணீர் வழங்கப்படுகிறது.
இதுபோன்ற சூழ்நிலை இல்லை குடும்ப விழாக்களின் போது
எடுத்து வருவதில் அலட்சியம் வழங்கல் பற்றி எந்த தகவலும் இல்லை
பராமரிப்பு

j) மாநகராட்சி நீர் விநியோகத்தில் இருந்து (தரம் மற்றும் அளவு அடிப்படையில்) பெறப்பட்ட திருப்தியின் நிலை

பருவங்கள்	***திருப்தி நிலை***								
	தண்ணீர் வகை	**நீரின் தரம்**				**நீரின் அளவு**			
		உயர்வாக திருப்தி	திருப்தி	மிதமாக திருப்தி	திருப்தி இல்லை	உயர்வாக திருப்தி	திருப்தி	மிதமாக திருப்தி	திருப்தி இல்லை
கோடை காலத்தில் (தேவை இருக்கும் போது மேலும்)	மென்மையான நீர்								
	கடின நீர்								
மற்ற போது பருவங்கள் (சப்ளை செய்யும் போது மீறுகிறது கோரிக்கை)	மென்மையான நீர்								
	கடின நீர்								

k) தண்ணீர் பற்றாக்குறையின் போது, நிலைமையை எவ்வாறு சமாளிப்பது
வெளியில் இருந்து கொள்முதல் பொதுவான பொது குழாய்களில் இருந்து பெறுதல்
உறவுகளின் வீடு / அண்டை வீட்டார் ஆழ்துளை கிணறு பயன்படுத்தவும்
கடின நீர் வழங்கல் அத்தகைய சூழ்நிலை இல்லை

l) குடிநீருக்காக ஏற்றுக்கொள்ளப்பட்ட வடிகட்டுதல் வகை
கொதித்தல் வடிகட்டுதல் வண்டல் வேறு எந்த முறை

m) நீர் விநியோகத்தின் போது நீங்கள் எதிர்கொள்ளும் சிரமங்கள் என்ன:
d)
e)
f)

V. சேகரிப்பு (எடுத்தல்) மற்றும் நீர் சேமிப்பு நடைமுறைகள்

a) தண்ணீர் சேகரிக்கும் முறைகள்: (பொருந்தக்கூடியதை ☑ டிக் செய்யவும்)

சேமிக்கப்பட்ட நீர் வகை		சம்ப்	மேல் நிலை நீர் தொட்டி	கொள்கலன்களில் சேகரிக்கப்பட்டது						கொள்கலன்கள், பீப்பாய்கள் மற்றும் டிரம்களில் சேகரிக்கப்பட்டது
				பொருட்கள்						
				எவர்சில்வர்	பித்தளை	செம்பு	பிளாஸ்டிக்	பானை	சிமெண்ட் தொட்டிகள்	
மென்மையான நீர்	குடிநீர்									
	மற்ற தேவை									
கடின நீர்										
குடிப்பதற்கு இல்லாமல் மற்ற நீர் தேவைக்காக வெளியில் இருந்து வாங்குதல்										
பாட்டிலில் அடைக்கப்பட்ட நீர் குடிப்பதற்காக										

பிற விருப்பங்கள் குறிப்பிடுகின்றன .....

b) நீர் சேமிப்புக்காக வழங்கப்பட்ட சம்ப்களின் எண்ணிக்கை:

மென்மையான நீர்: 1 2 3 4 மென்மையான கடின நீர்: 1 2 3 4

கடின நீர்: 1 2 3 4

c) சம்ப்பின் கொள்ளளவு: (சம்ப் 1)

3,000 லிட்டருக்கும் குறைவானது 3000 - 6000 லிட்டர்கள்

6000 லிட்டருக்கு மேல் மற்ற கொள்ளளவு

g) சம்ப்பின் கொள்ளளவு: (சம்ப் 2)

3,000 லிட்டருக்கும் குறைவானது 3000 - 6000 லிட்டர்கள்

6000 லிட்டருக்கு மேல் மற்ற கொள்ளளவு

h) எத்தனை நாட்களுக்கு ஒருமுறை சம்பை சுத்தம் செய்வீர்கள்

வாரத்திற்கு ஒரு முறை ஒரு மாதத்திற்கு ஒரு முறை 2

மாதங்களுக்கு ஒரு முறை 3 மாதங்களுக்கு ஒரு முறை

6 மாதங்களுக்கு ஒரு முறை வருடத்திற்கு ஒரு முறை 2

ஆண்டுகளுக்கு ஒரு முறை இன்னும் சுத்தம் செய்யப்படவில்லை

தேவைப்படும் போதெல்லாம் வேறு பதில் .....

i) மேல்நிலை நீர் தொட்டியின் வகை

சிமெண்ட் சின்டெக்ஸ் தொட்டி

j) மேல்நிலை தொட்டிகளின் கொள்ளளவு மற்றும் எண்ணிக்கை

நீர் வகை	மேல்நிலை தொட்டிகளின் எண்ணிக்கை					கொள்ளளவு (லிட்டர்களில்)				
	0	1	2	3	3 க்கு மேல்	500	750	1000	2000	2000 க்கு மேல்
கடின நீர்										
மென்மையான நீர்										
போர்வெல்										
குறிப்பிட்ட தண்ணீருக்காக அல்ல										

k) மேல்நிலை தொட்டியை சுத்தம் செய்தல்
வாரத்திற்கு ஒரு முறை ஒரு மாதத்திற்கு ஒரு முறை
2 மாதங்களுக்கு ஒரு முறை 3 மாதங்களுக்கு ஒரு முறை
6 மாதங்களுக்கு ஒரு முறை வருடத்திற்கு ஒரு முறை
2 ஆண்டுகளுக்கு ஒரு முறை இன்னும் சுத்தம் செய்யப்படவில்லை
தேவைப்படும் போதெல்லாம் வேறு பதில் ……..

l) மேல்நிலை தொட்டியை சுத்தம் செய்பவர்
தாமே செய்வர் மற்றவரின் உதவியை நாடுவர்
வேறு பதில் ……..

m) சுத்தம் செய்யும் நபர் அவுட்சோர்ஸ் செய்யப்பட்டிருந்தால், அவர்களின் சேவைக்காக வழங்கும் தொகை ரூ.....(தோராயமாக)

n) குழாயிலிருந்து மேல்நிலை தொட்டிக்கு எவ்வாறு கொண்டு செல்வது
உந்தி முறை ஈர்ப்பு முறை
வேறு எந்த முறையையும் குறிப்பிடவும் ……

o) நீர் எங்கு சேகரிக்கப்பட்டு சேமிக்கப்படுகிறது
சம்ப் மற்றும் மேல்நிலைக்கு மட்டும்
பானைகள் மற்றும் பாத்திரங்களில் மட்டுமே சேமிக்கப்படும்
சம்ப், மேல்நிலை மற்றும் கொள்கலன்களில்

p) குழாயில் இருந்து தண்ணீர் எவ்வளவு தூரத்தில் இருந்து எடுக்கப்படுகிறது

நீர் வகை	தூரம்			
	< 1 மீட்டர்	1 – 5 மீட்டர்	6 – 10 மீட்டர்	> 10 மீட்டர்
மாநகராட்சி – மென்மையான நீர்				
மாநகராட்சி - கடின நீர்				

q) தூரம் படிகளை உள்ளடக்கியது
5 க்கும் குறைவான படிகள் 10 - 20 படிகள்
20 படிகளுக்கு மேல் படிகள் இல்லை

r) எத்தனை மணி நேரம் தண்ணீர் வழங்கப்படுகிறது?

நீர் வகை	நீர் வழங்கல் காலம்				தண்ணீர் எடுக்க செலவழித்த நேரம்			
	1 மணி நேரத்திற்கு குறைவாக	1-2 மணி நேரம்	2-3 மணி நேரம்	வேறு பதில்	1 மணி நேரத்திற்கு குறைவாக	1-2 மணி நேரம்	2-3 மணி நேரம்	தண்ணீர் எடுக்க வேண்டாம்
மாநகராட்சி – மென்மையான நீர்								
மாநகராட்சி – கடின நீர்								

s) தண்ணீர் எடுக்கும் பணியில் ஈடுபடும் கருவிகள்
குழாய் பானை வேறு பதில் .....

t) தண்ணீர் எடுப்பதில் ஈடுபட்டும் நபர்
குடும்பத் தலைவி குடும்பத் தலைவர் பணிப்பெண்
மகன் வேறு பதில் .....

u) நீர் சேமிப்புக்காகப் பயன்படுத்தப்படும் பாத்திரங்கள்
எவர்சில்வர் பித்தளை செம்பு அலுமினியம்
பிளாஸ்டிக் மண் பானை வேறு பதில் .....

v) எவ்வளவு நாட்களுக்கு ஒரு முறை நீர் சேமிப்புக்கு பயன்படுத்தப்படும் பாத்திரங்களை சுத்தம் செய்யப்படும்
தினசரி 2 நாட்களுக்கு ஒரு முறை 5 நாட்களுக்கு ஒரு முறை
7 நாட்களுக்கு ஒரு முறை 10 நாட்களுக்கு ஒருமுறை
ஒருமுறை தண்ணீர் வழங்கப்படும் போது

w) பாத்திரங்களில் எத்தனை நாட்களுக்கு தண்ணீரை சேமித்து வைப்பீர்கள்?
5 நாட்கள் வரை 10 நாட்கள் வரை
15 நாட்கள் வரை அடுத்த நீர் விநியோகம் வரை

x) அடுத்த முறை தண்ணீர் வழங்கப்படும் போது பழைய தண்ணீரை என்ன செய்வீர்கள்
வெளியில் ஊற்றி விடுவேன் மீண்டும் பயன்படுத்துவேன்
குளிக்க தோட்டம்
துணி துவைக்க பாத்திரங்கள் கழுவுதல்
வாகனங்களைக் கழுவுதல் பழைய தண்ணீரை
உபயோகித்தப்பின் புதிய நீரை
உபயோகித்தல்
பழைய தண்ணீரை முதலில் பயன்படுத்துவது
மீண்டும் சம்ப்பில் ஊற்றி விடுவேன் நீரை பிடித்து வைப்பது இல்லை அனைத்து நீரும் செலவாகி விடும்

y) ஒரு முழு மேல்நிலைத் தொட்டி தண்ணீர் முழுமையாக எப்பொழுது செலவாகும்

தொட்டிகள் எண்ணிக்கை	தொட்டிகள் கொள்ளளவு (லிட்டர்களில்)						முழு மேல்நிலைத் தொட்டி தண்ணீர் எத்தனை நாட்களுக்குள் உபயோகப்படுத்தப்படும்				
	500	750	1000	1500	2000	< 2000	1 நாள்	1 – 2 நாட்கள்	2 – 3 நாட்கள்	3 நாட்களுக்கு மேல்	வேறு பதில்
1											
2											
3											
4											

VI. நீர் நுகர்வு / நுகர்வு சுயவிவரம்

a) நுகர்வு அளவு:

b) இந்த ஆண்டு பதிவுகளின்படி பயன்படுத்தப்பட்ட தண்ணீரின் அளவு (லிட்டர்களில்)

அளவு	ஜன 2017	பிப்	மார்	ஏப்	மே	ஜூன்	ஜூலை	ஆக	செப்	அக்	நவ	டிச	மொத்தம்
முதல்													
வரை													
பயன் படுத்தப்பட்ட தண்ணீர்													
தொகை செலுத்தப் பட்டது(ரூ))													

c) தண்ணீர் விலை:
தண்ணீர் வரி - செலுத்தப்பட்ட தொகை .....
மீட்டர் கணக்கின்படி – செலுத்தப்பட்ட தொகை.....
வருடாந்தம் இருமாதம் காலாண்டுக்கு ஒருமுறை
அரையாண்டு மாதாந்திரம் சரியான அலைவரிசை இல்லை

d) வெளியில் இருந்து தண்ணீர் வாங்கப்பட்டிருந்தால், அதன் அளவு
லாரி தண்ணீர்: ஆம் இல்லை பாட்டில் தண்ணீர்: ஆம் இல்லை

Water that has been procured from outside				
தண்ணீரின் அளவு (லிட்டர்களில்)	லாரி தண்ணீர்		பாட்டில் தண்ணீர்	
	எத்தனை நாட்களுக்கு ஒருமுறை	செலுத்தப்பட்ட தொகை	எத்தனை நாட்களுக்கு ஒருமுறை	செலுத்தப்பட்ட தொகை
20				
500				
1000				
1500				
2000				

வேறு பதில் .....

h) பின்வரும் நடவடிக்கைகளை மேற்கொள்ள தண்ணீரைக் கையாளுதல்:
வீட்டிற்குள் மென்மையான நீர் வழங்கல்
சமையலறையில் குளியலறையில் கழிவறைகளில் தோட்டத்தில்

சிங்க் தனி குடிநீர் கை கழுவுவதற்கு
வெளியில் கழுவும் பகுதியில்

i) பல்வேறு நடவடிக்கைகளுக்குப் பயன்படுத்தப்படும் நீர்: (பொருந்தக்கூடியதை ☑ டிக் செய்யவும்)

செயல்பாடு	பயன்படுத்தப்படும் நீர் வகை								
	மென்மையான நீர்			கடின நீர்			ஆழ்துளை கிணறு தண்ணீர்		
	எப்போதும்	சில சமயம்	ஒரு போதும் இல்லை	எப்போ	சில சமயம்	ஒரு போதும் இல்லை	எப்போது	சில சமயம்	ஒரு போதும் இல்லை
சமையல்									
குடிப்பதற்கு									
மற்ற சமையலறை வேலை									
துணி துவைத்தல்									
குளித்தல்									
கழிப்பறைகள்									
வீட்டை துடைக்க									
கை கழுவும் இடம்									
தோட்டம்									
வெளிப்புற சுத்தம்									

j) நடவடிக்கைகளை மேற்கொள்ள பயன்படுத்தப்படும் நீரின் அளவு: (பொருந்தக்கூடியதை ☑ டிக் செய்யவும்)

செயல்பாடு	பயன்படுத்தப்படும் தண்ணீரின் வகை - ஒரு நாளைக்கு (லிட்டர்களில்) நபர்களின் எண்ணிக்கை:												
	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	36-40	41-45	46-50	51-55	56-60
சமையல்													
குடிப்பதற்கு													
மற்ற சமையலறை வேலை													
துணி துவைத்தல்													
குளித்தல்													

கழிப்பறைகள்													
வீட்டை துடைக்க													
கை கழுவும் இடம்													
தோட்டம்													
வெளிப்புற சுத்தம்													

k) அதிகபட்சமாக பயன்படுத்தப்படும் தண்ணீரின் அளவு:

4-6 am	6-8am	8-10am	10-12am	12-2 pm	2-4 pm	4-6 pm	6-8 pm	8-10 pm	10pm-4pm

l) வீட்டில் பணிப்பெண் இருக்கிறாரா?
ஆம் இல்லை

m) பணிப்பெண்களின் எண்ணிக்கை?
1 2 3 வேறு பதில் .....

n) பணிப்பெண்ணின் வேலைகள்
சமையல் பாத்திரம் கழுவ துணி துவைத்தல்
வீட்டை துடைக்க வெளிப்புற சுத்தம் குழந்தை பராமரிப்பு
நோயாளி பராமரிப்பு

VII. நீர் உபயோகத்தில் வீட்டு உபயோகப் பொருட்களின் பங்களிப்பு

a) நீர் பாதுகாப்பு விஷயத்தில் பணிப்பெண்களை விட/ நம்மை விட வீட்டு உபயோகப் பொருட்கள் அதிக திறன் கொண்டவை என்று உங்கள் கருத்து என்ன?
ஆம் அது இல்லை அது இல்லை எப்போதும் இல்லை

b) தண்ணீரைப் பயன்படுத்தி வேலை செய்யும் வீட்டு உபயோகப் பொருட்களின் பட்டியல்

சாதனம்	பிராண்ட்	முழு தானியங்கி/அரை	வயது
• துணி துவைக்கும் இயந்திரம்			
• பாத்திரங் கழுவும் இயந்திரம்			
• தூசி உறிஞ்சி			
• நீர் சுத்திகரிப்பான்			

c) துணிகளை துவைக்கும் முறை: கை கழுவுதல் இயந்திரம் கழுவுதல்
வெளியே சலவைக்கு கொடுப்பது

d) எத்தனை நாட்களுக்கு ஒருமுறை சலவை இயந்திரத்தை உபயோகப்படுத்துவீர்கள்
தினமும் எத்தனை முறை ⟶ ஒருமுறை
இரண்டு நாட்களுக்கு ஒருமுறை ⟶ இரண்டு முறை
வாரம் ஒருமுறை ⟶ மூன்று முறை
வேறு பதில் ⟶ மூன்று முறைக்கு மேல்

e) பயன்படுத்தப்படும் நீர் சுத்திகரிப்பு வகை:
RO UV UF Candle filter செயல்படுத்தப்பட்ட கார்பன்
தண்ணீர் குடிக்கும் நோக்கங்களுக்காக மட்டுமே முழு வீடு

f) சுத்திகரிப்பு அமைப்பிலிருந்து கழிவு நீரை எவ்வாறு நிர்வகிக்கிறீர்கள்
வடிகால்களில் வெளியேற்றப்பட்டது செடிகளுக்கு
வேறு எந்த நோக்கத்தையும் குறிப்பிடவும்.....
எனது சுத்திகரிப்பிலிருந்து தண்ணீர் வீணாகாது

VIII. நீர் பாதுகாப்பு பகுப்பாய்வு

a) நீர் சேமிப்பு என்ற சொல்லை நீங்கள் அறிந்திருக்கிறீர்களா?
ஆம் இல்லை எங்கோ கேட்டது

b) நீங்கள் ஏதேனும் நீர் சேமிக்கும்/பாதுகாப்பு பொருட்களைப் பயன்படுத்துகிறீர்களா?
குழாய்களில் இணைக்கப்பட்ட நீர் தெளிப்பான்கள்
இரட்டை பறிப்பு தொட்டி
நீர் ஓட்டம் கட்டுப்பாடு மழை தலைகள்
ஓட்டம் கட்டுப்பாட்டு சாதனங்கள்

சம்ப், ஹெட் டேங்க் மேல் உள்ள செடிகளுக்கு ஷவர் கேன்களைப் பயன்படுத்துதல்
வேறு பதில் .....

c) நீர் பாதுகாப்பு முறைகளை நீங்கள் கடைப்பிடிக்கிறீர்களா?
மழை நீர் சேகரிப்பு
தண்ணீரை மீண்டும் பயன்படுத்துதல்
நீரை மறுசுழற்சி செய்தல்
வேலை செய்யும் போது பாத்திரங்களைப் பயன்படுத்துவதைக் கட்டுப்படுத்துதல்
தோட்டக்கலைக்கு சமையலறை கழிவு நீரை பயன்படுத்துதல்
RO கழிவு நீரை பயன்படுத்துதல்
தரையை சுத்தம் செய்வதற்கு மறுபயன்பாடு
வேறு பதில் .....

மழை நீர் சேகரிப்பு நிறுவல்

e) உங்கள் வீட்டில் மழை நீர் சேகரிப்பு உள்ளதா?
ஆம் இல்லை இல்லை என்றால், காரணம்.....

f) மழை நீரை சேமிக்கும் பழக்கம் உள்ளதா?.

g) ஆம் இல்லை இல்லை என்றால், காரணம்.....

h) மழை நீரை சேமிக்கும் முறை:
சம்ப் கொள்கலன்களில் நிலத்தடி குழி பொருந்தாது

i) சேகரிக்கப்படும் மழை நீரை எவ்வாறு பயன்படுத்துகிறீர்கள்:
குடிநீர் துணி துவைத்தல் பாத்திரம் துவைத்தல் உட்புற / வெளிப்புறத் தளங்களை சுத்தம் செய்தல்
தோட்டம் குளித்தல் வாகனம் கழுவுதல் சமையல்

j) நமது அன்றாட வாழ்வில் தண்ணீர் வீணாக்கப்படும் செயல்பாடுகள் என்ன?

எண்	செயல்பாடு	அடிக்கடி	மிதமாக	அரிதாக	ஒருபோதும் இல்லை
1	மேல்நிலை தொட்டி நிரம்பி வழிகிறது				
2	வாகனங்களை கழுவும் போது				
3	ஷவர் குளியல் எடுப்பது				
4	நீண்ட குளியல்				
5	பல் துலக்குதல் போது				
6	பாத்திரங்களை சுத்தம் செய்யு போது (திறந்த நீர் ஓட்டம்)				
7	ஷேவிங் செய்யும் போது				
8	பாரம்பரிய நடைமுறைகள்: வீட்டின் வெளியில் கழுவுவது				
9	நீர் கசிவுகள்				
10	கழிப்பறைகளை கழுவுதல்				
11	நீர் சுத்திகரிப்பு அமைப்புகளில கழிவு நீர்				
12	வேறு பதில்				

IX. தலையீட்டில் காட்டப்படும் ஆர்வம்

a) மேற்கண்ட நீர் பாதுகாப்பு நுட்பங்களைத் தவிர, வீணாவதைக் குறைப்பதற்காகப் பின்பற்றக்கூடிய உங்கள் மதிப்புமிக்க பார்வைப் புள்ளிகள் என்ன?
மனரீதியாக நாம் மேற்கொள்ளும் அனைத்து செயல்களிலும் நீர் சிந்தனையுடன் இருக்க வேண்டும்
தண்ணீர் வீணாவது குறித்து விழிப்புணர்வோடு இருப்பது
வெளிப்புற / தோட்ட வேலைகளுக்கு போர்வெல் / கடின நீர் பயன்படுத்தவும்
தண்ணீரை சேமிக்க வேண்டும்

சலவை இயந்திரத்துடன் ஒப்பிடும் போது, கைகளால் கழுவுதல் குறைந்த நீரை உட்கொள்ளும்
சமையலறையிலிருந்து வெளியேறும் கழிவு நீர் நம் வீடுகளில் உள்ள மரங்களைச் சென்றடையச் செய்ய வேண்டும்
தண்ணீரை மீண்டும் பயன்படுத்தலாம்
தண்ணீரை மறுசுழற்சி செய்யலாம்
மழை நீரை சேமித்து முறையாக பயன்படுத்த வேண்டும்
முறையான திட்டமிடல், விநியோகம் மற்றும் நீர் மேலாண்மை நடைமுறைகள் மூலம்
பொது குழாய்களை பயன்படுத்தாமல் இருக்கும்போது மூடி வைக்க வேண்டும்
தண்ணீரை சேமிக்க குழந்தைகளுக்கு முதலில் கற்பிக்க வேண்டும்
தண்ணீரை சேமிக்க தனிமனித மனப்பான்மை மாற வேண்டும்
பொது குழாய்களில் பாத்திரங்கள், வாகனங்கள், கால்கள் கழுவுவதை தடை செய்ய வேண்டும்
மேல்நிலைத் தொட்டிகளில் தண்ணீர் நிரப்புவதில் தானியங்கி அமைப்பை நிறுவுதல் வேண்டும்
குளிக்கும் போது நீரின் பயன்பாட்டைக் குறைக்கவும்
ஒவ்வொரு வீட்டிலும் மழைநீர் சேகரிப்பு வசதியை ஏற்படுத்த வேண்டும்
மேம்பட்ட தொழில்நுட்பம் - புதிய தொழில்நுட்ப சலவை எந்திரத்திற்கு மாறுவது தண்ணீரை சேமிக்கிறது
நீரின் பயன்பாட்டைக் கட்டுப்படுத்துதல்
நீர் வழங்கல் அளவிடப்பட வேண்டும்
குழாய்களில் கசிவு ஏற்பட்டால் உடனடியாக நடவடிக்கை எடுக்க வேண்டும்
மீண்டும் பயன்படுத்தும் முறைகளை அதிகம் பின்பற்ற வேண்டும்
மேல்நிலை நீர்த்தேக்க தொட்டியில் இருந்து நீர் நிரம்பி வழிவதை தவிர்க்க வேண்டும்
நமது தேவைக்கேற்ப பயன்படுத்த வேண்டும்
பணிப்பெண்களை வேலைக்காக தவிர்ப்பது நல்லது
பழைய உபகரணங்களை மாற்ற வேண்டும்

b) வீட்டிலேயே பயனுள்ள நீர் மேலாண்மை நடைமுறைகளை மேற்கொள்ள உங்கள் பரிந்துரைகள் என்ன?
வீட்டில் நிலத்தடி நீர் சுரண்டலை கட்டுப்படுத்தவும்
ஒவ்வொரு பகுதி/வீட்டின் நீர் நுகர்வு முறையை கண்காணிக்க வேண்டும்
நாளைக்காக நீர் சேமிக்கப்பட வேண்டும்
ஆழ்துளை கிணற்றின் தரத்தை மேம்படுத்தும் வகையில் மழைநீரை சேகரிக்க வேண்டும்
சமையலறையிலிருந்து வெளியேறும் கழிவு நீர் நம் வீடுகளில் உள்ள மரங்களைச் சென்றடையச் செய்து மீண்டும் பயன்படுத்தப்பட வேண்டும்
குறைந்த நீர் அளவை வெளியேற்றும் குழாய்களைப் பயன்படுத்தலாம்
பாத்திரங்களை கழுவும் போது, கழுவுவதற்கு ஒரு தொட்டியில் தண்ணீரை சேகரிக்கவும்
நடுத்தரம் மற்றும் குறைந்த வருமானம் பிரிவுகள் ஒப்பிடும் போது உயர் வருமானம் கொண்ட குடும்பங்கள் அதிக நுகர்வு மற்றும் அதிக கட்டணம் செலுத்துகின்றன
சமையலறை பாத்திரங்களை ஊறவைக்க வேண்டும், அதனால் கழுவுவதற்கு எளிதாகவும் குறைவாகவும் தண்ணீர் பயன்படுத்தப்படும்.
சமையலறை கழிவு நீர்+அரிசி பிசைந்து உயிர் எரிவாயு ஆலைகளுக்கு பயன்படுத்தப்படும்
தண்ணீர் வீணாவது குறித்து விழிப்புணர்வோடு இருப்பது
ஒவ்வொரு செயலுக்கும் தண்ணீர் உபயோகம் குறித்த விழிப்புணர்வு விரயத்தை குறைக்கும்
நீர் நுழைவாயில்களின் வடிவமைப்பில் மாற்றம்
தண்ணீரைப் பயன்படுத்தும் மக்களின் மனப்பான்மை மாற வேண்டும்
வலுவான அரசாங்க கொள்கைகளை செயல்படுத்துதல்
ஒரு வீட்டில் உள்ள நபர்களுக்கு குறிப்பிட்ட அளவு நீர் விநியோகம்
குழாய் பொருத்துதல்களை பராமரித்தல் மற்றும் நீர் கசிவுகளை அடிக்கடி சரிபார்த்தல்

கை கழுவுவதை விட சலவை இயந்திரம் மூலம் கழுவினால் தண்ணீர் உபயோகத்தை குறைக்கலாம்
தண்ணீரை மீண்டும் பயன்படுத்தவும், மறுசுழற்சி செய்யவும் ஏற்பாடு செய்ய வேண்டும்
குளிக்கும் போது ஷவர் பயன்படுத்தாமல், வாளியை பயன்படுத்தவும்
தண்ணீர் விரயத்தை குறைக்க சிறிய அளவிலான கோப்பைகளை பயன்படுத்தவும்
அடுக்குமாடி குடியிருப்புகளில் கழிவுநீர் சுத்திகரிப்பு நிலையங்களை (மறுசுழற்சி) கட்டாயமாக கொண்டு வரலாம்
குழாய்களில் நீரின் வேகத்தை கட்டுப்படுத்தும் கருவி பொருத்தப்பட வேண்டும்
வீட்டின் வெளிப்புறங்களில் கழுவுவதற்கு பதிலாக துடைத்து விடலாம்
வாகனங்களை தினமும் தண்ணீரால் கழுவுவதை குறைக்கவும்
நவீன வசதிகள் அதிகமாக இருப்பதால் தண்ணீர் வீணாகிறது
குழாய் மூலம் தண்ணீரை வீணாக்குவதற்கு பதிலாக வாகனங்களை துடைப்பது
குறைந்தபட்ச குளியல் நேரம்
உபயோகிக்கும் பாத்திரங்களைக் குறைத்தல்
குழாயை சரியாக மூட வேண்டும். தண்ணீர் சொட்டு சொட்டாக விழுவதால் தண்ணீர் வீணாகும்
தண்ணீர் குழாயை திறந்துவிட்டு குளிக்க வேண்டாம். தண்ணீரைச் சேமிக்கும் வாளியில் தண்ணீரைப் பயன்படுத்த வேண்டும்

c) கோவையில் 24*7 குடிநீர் திட்டம் விநியோகம் குறித்து உங்கள் கருத்து என்ன?
நீரை கையாளும் நடத்தை மாறப்போவதில்லை
இது வருவாய் ஈட்டும் திட்டம்
நாம் எதைப் பயன்படுத்துகிறோமோ அந்த பணத்தை நாம் செலுத்த வேண்டும்
நீரின் வீண் விரயத்தை அதிகரிக்கிறது
இந்த மாதிரி எதிர்கால திட்டம் இருப்பதில் மகிழ்ச்சி
யோசனை இல்லை
ஏற்கனவே போதுமான அளவு தண்ணீர் உள்ளது
தண்ணீர் நிறைய இருந்தாலும் தனிப்பட்ட முறையில் பயன்படுத்தும் நடத்தை மாறக்கூடாது
எங்கள் பகுதியில் இல்லை
முதலில் என்ன நடக்கிறது என்று பார்ப்போம்

d) நீர் பாதுகாப்பு மற்றும் மேலாண்மை நடவடிக்கைகள் பற்றி மேலும் அறிய நீங்கள் ஆர்வமாக / விரும்புகிறீர்களா?
ஆம் இல்லை இப்போது இல்லை

e) ஏதேனும் நீர் குறித்த அறிவு பரப்புதல் கூட்டம் நடத்தப்பட்டால் அதில் பங்கேற்பீர்களா?
ஆம் இல்லை இப்போது இல்லை

APPENDIX – B

Ethical Clearance Certificate

INSTITUTIONAL HUMAN ETHICS COMMITTEE

Avinashilingam
Institute for Home Science and Higher Education for Women
University
(Estd. u/s 3 of UGC Act 1956)

Chairman
Dr. S. Ramalingam
Principal, PSG Institute
of Medical Sciences
& Research, Coimbatore

Member Secretary
Dr.S.Uma Mageshwari
Associate Professor,
Department of Food Service
Management & Dietetics

Members
Dr. S. Kowsalya
Dr.P.R.Padma
Mr. K.Arulmoli (Legal Expert)
Dr. N.S. Rohini
Dr.A. Saraswathy
Mrs. V. Mangayarkarasi
Dr.Subhashini K. Sripathi
Mrs. S. Radha Devi
Dr.G.Victoria Naomi
Dr. Judith Justin
Dr.AnithaSubash

19th March 2018

To
Ms. J. Sofia Jannet
Department of Resource Management
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore – 641 043

Dear Sofia Jannet,

Ref: Your proposal No. IHEC/17-18/RM/12 "Domestic Water Demand Management – A Modern Perspective" submitted for approval of the IHEC on 14th December.

The Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No. IHEC/17-18/RM/12 "Domestic Water Demand Management – A Modern Perspective" submitted by you. The Approval number for the same is AUW/ IHEC/RM -17-18/XPD/12.

We wish you all the best in your research endeavours.

Regards,

V. Uma Mageshwari
Dr.S.Uma Mageshwari
Member Secretary

Institutional Human Ethics Committee

APPENDIX – C

Indian Standards and WHO Guidelines for Drinking Water

Organoleptic and physical parameters of water					
Sl. No	**Parameter**	**Indian Standard Drinking Water Specification**			**World Health Organization (WHO Guideline)**
		Units	**Requirement (Acceptable limit)**	**Permissible limit**	**Maximum Allowable Concentration**
Organoleptic and physical parameters					
1.	Colour	Hazen units	5	15	15 true colour units
2.	Odour		Agreeable	Agreeable	-
3.	pH value		6.5 – 8.5	No relaxation	6.5 – 8.5
4.	Taste		Agreeable	Agreeable	-
5.	Turbidity	NTU	1	5	5
6.	Total Dissolved Solids	mg/l Max	500	2000	1000
General parameters concerning substances					
7.	Al – Aluminium,	mg/l Max	0.03	0.2	0.2
8.	N – Ammonia	mg/l Max	0.5	No relaxation	-
9.	MBAS - Anionic detergents	mg/l Max	0.2	1.0	-
10.	Ba - Barium	mg/l Max	0.7	No relaxation	-
11.	B – Boron	mg/l Max	0.5	1.0	-
12.	Ca – Calcium	mg/l Max	75	200	-
13.	CL_2 – Chloramines	mg/l Max	4.0	No relaxation	-
14.	Cl – Chloride	mg/l Max	250	1000	250
15.	Cu – Copper	mg/l Max	0.05	1.5	1.0
16.	F – Fluoride	mg/l Max	1.0	1.5	1.5
17.	Free Residual Chlorine	mg/l Min	0.2	1	-
18.	Fe – Iron	mg/l Max	0.3	No relaxation	0.3
19.	Mg – Magnesium	mg/l Max	30	100	-
20.	Mn – Manganese	mg/l Max	0.1	0.3	0.1
21.	NO_3 – Nitrate	mg/l Max	45	No relaxation	10
22.	SO_4 – Sulphate	mg/l Max	200	400	400
23.	H_2S – Sulphide	mg/l Max	0.05		-
24.	Total alkalinity as calcium carbonate	mg/l Max	200	600	-
25.	C_aCO_3 Total hardness	mg/l Max	200	600	500
26.	Zn – Zinc	mg/l Max	5	15	5

Source: Indian Standard Drinking Water Specification, 2012 and Central Pollution Control Board, 2007

APPENDIX – D

Brochure

Water !!
It is interesting and thought Provoking

Title: Water

Grandfather saw it in River
Father saw it in well
We saw in tap
Our children see it in bottle
Where will our Grand Children See it!
In CAPSULE ????
If we still neglect

It will be seen only in Tears

Concerned with the Public Welfare

By
Mrs.J.Sofia Jannet, Research Scholar, M.Sc., NET.,
(Assistant Professor)
&
Dr.M.R.Thilakam, M.Sc., M.Phil.,Ph.D.,
Professor and Head
Department of Resource Management
School of Home Science
Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore - 641043

"If there is magic on this planet, it is contained in water"
- Loren Eiseley

12

Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category A by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with A+ Grade by NAAC. Recognised by UGC Under Section 12 B
Coimbatore - 641 043, Tamil Nadu, India

Community Vision on Water Management Practices

Coimbatore West Zone - Knowledge Dissemination and Awareness Session for Homemakers

29.05.2021- Saturday

03.00 pm onwards

Be Smarter to Save Water

"நீர் இன்று அமையாது உலகுஎனின் யார்யார்க்கும்
வான் இன்று அமையாது ஒழுக்கு"
- திருவள்ளுவர்

1

There is a thin line between using water and wasting water

Innards

Facts on water

Metonym for water

Realize the colours of water

Importance of water

Water Demand

Upshot of increased water demand

Water Scarcity - In our City

Quality of Stored Water – Observant of the Hour

Water Pollution

Gender Inequality - Paradigm Shift

Effective Use of Water – A Community Resource

Domestic Water Consumption – Micro components

Tips to conserve water at domestic level

"The earth, the air, the land, and the water are not an inheritance from our forefathers but on loan from our children. So we have to handover to them at least as it was handed over to us.

- Mahatma Gandhiji
-Ashcraft and Mayer, (2017)

Water is a gift from the creator, Protect it! Respect it!

Facts on water

- Out of the entire volume of water that is available on the planet, **99.7%** was predicted to be present as oceans, soil, icebergs or floating in atmosphere in vaporized form.
- Only 0.3% of total water present on the earth's surface is useful for the mankind
- The entire water assets of India are anticipated at 1,897 sq km per annum.
- It was projected that by 2025 myriad parts of India will join nation or region to have unconditional water paucity
- ***85%*** of the world population lies in the driest half of the Earth.
- ***783*** Million People do not have access to clean water.
- Water availability is expected to decrease by ***50%*** in many regions by ***2030***.
- In developing countries ***90%*** of wastewater flow untreated into rivers, lakes and highly productive coastal zones threatening health, food security and access to safe drinking and bathing water.
- In India ***21%*** of the country, diseases are water related

(Metonym) Water is proudly be entitled as
"Matrix of Life - Elixir of Life – Ubiquitous Material - Economic Good – Unique – Liquid Gold – Life Creator - Universal Drug - Renewable Resource – Nature's Free Gift

No matter, how much rich you are, you can't live without water

Realize the colours of water

Blue Water is the water existing as renewable ground water in the aquifers and as surface water in water bodies

Green Water refers to total evaporation from agricultural production, including evapo transpiration from plants and evaporation from irrigation water

Grey Water is the waste water from baths, sinks, washing machines and other kitchen appliances.

White Water clean, clear tap water is regarded as white by people judging water quality. It can be collected from dams, lakes or rivers and has undergone treatment, making it fit for all uses, including drinking

Black Water sewage effluent is black, where it must go through treatment before releases into the environment. The quality of this treatment can be made by simple septic tank in domestic sectors

Importance of Water

- Life on Earth is sustained by water
- Water is one of the most basic human needs.
- Water permeates the largest partThere are many uses of water, some of the most important direct uses of water are:
- (i) Agricultural uses for irrigation of crops
- (ii) Industrial uses
- (iii) Domestic uses. Indirect uses of water include
- (iv) Production of hydro-electricity
- (v) Inland transportation
- (vi) Recreation and water sports
- of political, economic, social and even religious conflicts.
- Fresh water on earth is finite in the form of ice and permanent snow cover in Antartic and Artic regions.
- Day by day our need to water, increases where the supply decreases

Water is more precious than Gold

Water Demand

- India uses more water than any other country.
- Indians are the largest freshwater users in the world.
- Groundwater and surface water are the two sources of water available for human consumption.
- Groundwater is the major source of drinking water in urban and rural India.
- Around 65% of India's total water demand is for groundwater.
- Therefore with growing demand for water and depletion of the available water, assured supply of good quality water is becoming a growing concern.
- Demand for water in the country is projected to very soon overtake the availability of water.
- In some regions of the country, it has already happened. The rapid increase in population, urbanization and industrialization has led to a significant increase in water requirement.
- Domestic demand for water is expected to grow by 40 percent from 41 to 55 trillion liters
- India possesses about 432 bcm of groundwater replenished yearly from rain and river drainage, but only 395 bcm are utilizable.
- Of that 395 bcm, 82% goes to irrigation and agricultural purposes, while only18% is distributed between domestic and industrial.
- In India, the per capita average annual fresh water availability has reduced from 5177 cubic meters in 1951 to about 1869cm in 2001 to 1545 cubic meters as per the 2011 census and is estimated to further come down to 1341cm in 2025 and 1140 cm in 2050.
- However, with increasing campaigns by NGOs and civil societies, awareness of water related environmental problems is increasing.
- By 2050, it is feared that around 2.7 billion people will face acute water shortage depending on factors like population exploitation and policy changes.
- The unadjustment of the demand and supply of water could cause water crisis which is already happening in some of countries in the world.

Ask the importance of water to a thirsty man

Upshot of increased water demand

- *Lack of safe drinking water*
- *Inadequate access to water for sanitation and waste disposal.*
- *Groundwater over drafting (excessive use)*
- *Overuse and pollution of water resources*
- *Regional conflicts over scarce water resources*
- *Waterborne diseases*
- *In addition of human population, vegetation and wildlife will be the victims*

Water Scarcity

THE TIMES OF INDIA

Coimbatore: The city residents are supplied drinking water only once in seven to 10 days, against four to seven days earlier, as the water level in Siruvani reservoir is fast nearing dead storage capacity. According to them, the city corporation has also cut down on the water supply duration.

R Deepa, a resident of Venkatapuram, said, "We have been receiving drinking water only once in 10 days for the past two months. While we store water in multiple containers, at times that won't last still the next supply. In that case, we have no other option, but to purchase water." The situation, she said, would be worse if the city corporation failed to supply borewell water daily.

Suresh, a resident of Saibaba Colony, said they hadn't received drinking water for the past 15 days. "Water was supplied a few days ago, but only to be stopped within a few minutes as it was contaminated. How could we manage without water supply for such a long time?"

"The frequency of water supply could be improved once the water level in the reservoir goes up. We are hopeful that its catchment areas would receive good rainfall," the source said.

In Chennai, water shortage is a major concern, and though 85% are aware of the desalination plant set up by the government, only 12% believe it will work. 88% support the government's policy of installing rainwater harvesting systems in every household.

Residents of Velandipalayam waiting to collect water from lorries

Pure water = better life. Don't ruin it

Water usage in a family

- Water for consuming - cooking and drinking
- Water for cleaning - clothes and utensil washing, bathing, toilet flushing and cleaning
- Water for facilities - car washing, gardening and other casual tasks
- Water for productivity - pet care and maintenance, other construction works

Quality of Stored Water - Observant of the Hour

- Key factors - practices of water collection and storage
- Choice of water collection and storage containers or vessels.
- Inadequate storage conditions and vulnerable water storage containers, increased microbial contamination
- Increased risks of waterborne infectious diseases
- Higher levels of microbial contamination in storage vessels having wide openings (e.g., buckets and pots)
- Vulnerability to introduction of hands, cups and dippers that can carry fecal contamination, and lack of a narrow opening for dispensing water.
- Other factors contributing to greater risks of microbial contamination of stored water are
  - higher temperatures,
  - increased storage times
  - higher levels of airborne particulates (dust storms)
  - inadequate hand washing
  - use of stored water to prepare weanling
  - other foods that also become microbiologically contaminated

Water Pollution

Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment.

Water Pollutants

The main water pollutants include

- Bacteria
- Viruses
- Parasites
- Fertilizers
- Pesticides
- Pharmaceutical products
- Nitrates
- Phosphates
- Plastics
- Faecal waste and
- Radioactive substances.

Gender Inequality - Paradigm Shift

Not only at the domestic level, women are also under-represented in the place of careers, training and prospects which is dominated by men.

An efficient water management is to be democratic, transparent and focus on the needs of the people. The family has been going through a new dimension of transformation and changes in recent times. Both men and women must have an equal say. Almost all women wish to have their equal opportunities, rights and access in the society.

In recent days men are trying to give equal right, shares, opportunities and freedom for women in modern families by sharing few household chores like fetching of water. This projects transformation towards greater equality among men and women from social inequality.

Effective Use of Water – A Community Resource

- Water is a natural and vital life sustainable element, precious gift from God, to mankind.
- It can also be termed as "Life Giving Resource".
- Since water is available freely by nature, people use it lavishly. The excessive use of water by exploding population has made our water rich country into water scarce country.
- This water scarcity situation is estimated to grow more in future.
- The only answer to address the permanent solution to water scarcity is to adopt effective water management practices.
- A good water management refers to ideal and resourceful use of water for all the activities, reducing water loss such as leakages and say no to water pollution.
- An effective water management should be adopted and practiced and should be started at each home.
- Information campaigns and education programmes may be executed to change the consumer attitudes and behaviours.
- Implementing water metering system, identifying illegal water connections, replacing old bath and tap fittings with more efficient ones, attending to water leakages, upgrading to new appliances would lay a new paradigm for future water conservation and efficient water savings.
- It is our shared responsibility to govern and manage the community resource – WATER.

Domestic Water Consumption – Micro components

- ✓ Good management starts at home.
- ✓ An increased rate of water usage - people's careless water use behavior, higher living standards of the people, water leakage, hesitate to upgrade the old appliances.
- ✓ To manage the water use in a house it is necessary to understand the water consumption by micro-components (i.e) for individual activities which concentrate on water.

Water conservation is key for a sustainable future for you and me

- ✓ The difference in the volume of water when used by the homemaker and by a paid staff should be noticed.
- ✓ The amount of water that was used undertaking traditional practice or with the help of any equipment involved should be assessed.
- ✓ More volume of water was used for activities like
    - Washing of clothes,
    - Bathing, and
    - Flushing of the toilet
- ✓ Using overhead showers results in higher wastage of water. Usage of showers can be limited or restrict the use of overhead shower.
- ✓ Attempt can be made to recycle the water used for other purposes like toilet flushing, gardening etc.
- ✓ Traditional practices of washing clothes consume more water.
- ✓ And it is necessary to shift to the operating of latest technologies meant for clothes washing for efficient water management.
- ✓ Even though the latest innovation of dual flush water cistern saves water, but it requires operating multiple times to clean.
- ✓ Higher consumption of water is required in this dual flushing system.
- ✓ People should be conscious on the water wastage areas and be aware of various water conservation ideas.
- ✓ People's attitude towards water conservation cannot be changed in a day by conducting only awareness and lectures unless installation of efficient water conservation tools to the fixtures must be encouraged.
- ✓ In a long run it was believed that this would substantially control the wastage of water.

Let's all do our share to conserve water with care

Tips to conserve water at domestic level

There is an urgent need to utilize this valuable resource in an efficient way and more and more water saving techniques such as waterless urinals, waterless car washes, rain water harvesting etc should be used in order to save water for future.

Final note to say: Our next destination for a sustainable, cost-efficient, and quality water management system can be made possible only by smart water systems run by ***Artificial Intelligence.***

APPENDIX – E

Copyright Document

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

सत्यमेव जयते

Extracts from the Register of Copyrights

प्रतिलिप्यधिकार कार्यालय, भारत सरकार | Copyright Office, Government Of India

दिनांक/Dated:09/11/2023

1.	पंजीकरण संख्या/Registration Number	:	**CF-5409/2023**
2.	आवेदक का नाम, पता तथा राष्ट्रीयता Name, address and nationality of the applicant	:	AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN , BHARATHI PARK ROAD TATABAD, FOREST COLLEGE CAMPUS, SAIBABA COLONY, COIMBATORE – 641043, TAMIL NADU, INDIA-641043 INDIAN
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6.	कृति की भाषा Language of the work	:	TAMIL
7.	रचयिता का नाम, पता और राष्ट्रीयता तथा यदि रचयिता की मृत्यु हो गई है, तो मृत्यु की तिथि Name, address and nationality of the author and if the author is deceased, date of his decease	:	DR. M. R.THILAKAM , PROFESSOR, DEPARTMENT OF RESOURCE MANAGEMENT, AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN, BHARATHI PARK ROAD TATABAD, FOREST COLLEGE CAMPUS, SAIBABA COLONY, COIMBATORE -641043 INDIAN MRS. J. SOFIA JANNET , RESEARCH SCHOLAR, DEPARTMENT OF RESOURCE MANAGEMENT, AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN, BHARATHI PARK ROAD TATABAD, FOREST COLLEGE CAMPUS, SAIBABA COLONY, COIMB-641043 INDIAN
8.	कृति प्रकाशित है या अप्रकाशित Whether the work is published or unpublished	:	UNPUBLISHED
9.	प्रथम प्रकाशन का वर्ष और देश तथा प्रकाशक का नाम, पता और राष्ट्रीयता Year and country of first publication and name, address and nationality of the publisher	:	N.A.
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11.	कृति में प्रतिलिप्यधिकार सहित विभिन्न अधिकारों के स्वामियों के नाम, पते और राष्ट्रीयताएं और समनुदेशन और अनुज्ञप्तियों के विवरण के साथ प्रत्येक के अधिकार का विस्तार, यदि कोई हो। Names, addresses and nationalities of the owners of various rights comprising the copyright in the work and the extent of rights held by each, together with particulars of assignments and licences, if any	:	AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN , BHARATHI PARK ROAD TATABAD, FOREST COLLEGE CAMPUS, SAIBABA COLONY, COIMBATORE – 641043, TAMIL NADU, INDIA-641043 INDIAN
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13.	यदि कृति एक 'कलात्मक कृति' है, तो कृति पर अधिकार रखने वाले व्यक्ति का नाम, पता और राष्ट्रीयता सहित मूल कृति का स्थान। (एक वास्तुशिल्प कृति के मामले में कृति पूरी होने का वर्ष भी दिखाया जाना चाहिए) If the work is an 'Artistic work', the location of the original work, including name, address and nationality of the person in possession of the work. (In the case of an architectural work, the year of completion of the work should also be shown).	:	N.A.
14.	यदि कृति एक 'कलात्मक कृति' है जो किसी भी माल या सेवाओं के संबंध में उपयोग की जाती है या उपयोग किए जाने में सक्षम है, तो आवेदन में प्रतिलिप्यधिकार अधिनियम, 1957 की धारा 45 की उप–धारा (i) के प्रावधान के अनुसार व्यापार चिह्न रजिस्ट्रार से प्रमाणन शामिल होना चाहिए। If the work is an 'Artistic work' which is used or capable of being used in relation to any goods or services, the application should include a certification from the Registrar of Trade Marks in terms of the provision to Sub-Section (i) of Section 45 of the Copyright Act, 1957.	:	N.A.
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Registrar of Copyrights

APPENDIX – F

Plagiarism Report

Exploration of Domestic Water Management Practices and Paradigm Shift using IoT Enabled AI System for Devising Water Conservation in Ingenious Homes

ORIGINALITY REPORT

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Coimbatore – 641 043, Tamil Nadu, India

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APPENDIX – G

Publications

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Appendix L2

(Item No 5 of Check List) Details of Research Publications

S.No	Article	Journal	Other Details Vol/No/Page No/ Year	Published in UGC-CARE / Scopus Indexed/ Web of Science
1	GENDER DISPARITY IN FETCHING DRINKING WATER - A CASE STUDY	JOURNAL OF INDIAN WATER WORKS ASSOCIATION	VOL: LIV No: 3 P.p: 175 - 177, JULY 2022	UGC CARE APPROVED
2	WATER MANAGEMENT PRACTICES AMONG URBAN HOUSEHOLDS OF COIMBATORE CITY. TAMILNADU - A CASE STUDY.	JOURNAL OF INDIAN WATER WORKS ASSOCIATION	VOL: LIV No: 4 P.p: 263 - 267, OCTOBER 2022	UGC CARE APPROVED.

*Proof of list of Journals from Internet to be attached along with copies of reprints.

Scholar : MRS. S. SOFIA JANNET

Supervisor : DR. M.R. THILAKAM

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Inaugural of Meerut Centre Indian Water Works Association

Gender Disparity in Fetching Drinking Water – A Case Study

J. Sofia Jannet
Teaching and Research Fellow, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore – 641043, Tamil Nadu, India.
Email: sofiajannet@gmail.com; Mobile: +91 98438 70005

M.R. Thilakam
Professor and Head, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore–641043, Tamil Nadu, India.
Email: dr.m.r.thilakam57@gmail.com; Mobile: +91 99445 25027

Abstract: *Water management is an administration process of dealing, handling and controlling the available water effectively and efficiently. In Indian houses always girl children are expected and found to work and help her mother in the kitchen for cooking, cleaning, washing, sweeping, fetching water etc. Gender role has been rooted deeply even in modern societies and it reflects in every phase of our life. Gender inequality is evident since age's results in male domination and exploitation of women by men. The objective of this study is to understand the issue of gender inequality among the individuals especially in managing water.*

Key Words: *water management, gender, inequality, domination, exploitation*

1. INTRODUCTION

This world has always belonged to males, and none of the reasons given for this have ever seemed sufficient –Simone de Beauvoir. Water is one of the most valuable natural resource, an abundant source of food, minerals and medicines. Due to its limited availability, it is a resource that needs thorough protection. Safe and hygienic drinking water supply has become a continuous serious problem. It is important to manage the water resources adequately to ensure water sufficiency for future generations. The continuing growth in population, economic and social development increases the pressure on the water resources all over the world. Due to that, the number of countries dealing with water scarcity is increasing day by day (Nazer, 2010)

There are many uses of water, some of the most important direct uses of water are: (i) Agricultural uses for irrigation of crops, (ii) Industrial uses, (iii) Domestic uses. Indirect uses of water include, (iv) Production of hydro-electricity, (v) Inland transportation, (vi) Recreation and water sports, (Chatterjee, 2008). We depend upon water to satisfy our basic needs, and clean water for our survival. Even our religious scriptures refer to the importance of water and scarcity. According to Renzetti (2002), water demand in the domestic sector is growing at a great speed. In addition water is used in production of goods and services, growing crops, producing electricity, providing habitat for wildlife, assimilating wastes, creating recreational opportunities and satisfying cultural and spiritual needs. There are several dimensions to how one defines the 'use' of water.

Such a wonderful creation of God has an association or sometimes related to feminine calm and quiet, sometimes wild and stormy but moving forward towards its target. Women have a primary role and responsibility towards managing water at home. As they depend largely on water, they have extensive knowledge about water source, location and its quality and storage methods. Thus women play a key role in water management since ages. Women have made considerable inroads into other areas of public life and gender relationships have undergone significant transformations regarding water infrastructure. The production of water now remains highly technical, masculine field of action. The provision and supply of clean water to homes has very important benefits for women. Piped water reduces the burden of sourcing water. Hot water systems reduce effort spent heating water within the home, and improved standards of cleanliness and hygiene reduce illness and the work of caring for the sick, which undoubtedly improved women's lives. Now it is also associated with a culture of urban control and discipline which limited women's ability to engage in public life and paid work once upon a time (Sarah, 2018). This paper demonstrates the role of women in collecting water for household purposes in the family systems of the modern city.

2. OBJECTIVES OF THE STUDY

- To identify the existing family systems and the women status in the selected locale.
- To understand the distribution pattern, time utilized to collect water among the selected families.
- To find the existence of gender inequalities, in collecting water among selected households.

3. METHODOLOGY

Coimbatore, a well-known destination was selected for this study. It incorporated samples of 100 households. The samples were identified and included in the study by adopting convenience sampling. Face to face interview and

observation technique was executed by selecting interview schedule as the tool for this study. The salient findings are presented as follows:

3.1 Salient Findings

3.1.1 Type and Size of the Family

The Table 1, presents details on the same. The study revealed that a majority of 94 per cent of surveyed households still lead patriarchal family system among which 27 per cent were in joint family system and the rest 73 per cent were living in nuclear family. About 78 per cent of the households had family size ranging between two to four members. According to the result, it is surprising that only six per cent were headed by women in whom 50, 33 and 17 per cent reported to be in joint, nuclear and extended family respectively. However 83 per cent (33%, 50%) had three to four members.

3.1.2 Age of the Family Head and Women Status

Details on this aspect is presented under the Table 2. The selected respondents were categorised into four age groups namely below 30 years, 31-40 years, 41-50 years and above 50 years. Among the homemakers only three per cent belonged to the age group of below 30 years, while 21 per cent were in the age group of 31-40 years, followed by 28 per cent whose age ranged between 41-50 years. It was also found about 48 per cent belonged to the age group of above 50 years.

3.1.3 Frequency of Fetching Drinking Water and Time Spent for the Collection

Considerable part of women time is spent in fetching water and other domestic chores thereby reducing time that is left for productive work. It has been found that water distribution ranges from minimum 5 days to maximum of 20 days in the selected city. Table 3 gives the necessary information.

Twenty three per cent of household's fetched water once in five days followed by 41 per cent of them who had to collect water once in six to ten days, and 12 per cent reported that water has been supplied once in 11-15 days. Six per cent recorded that they were been provided with drinking water once in more than 20 days. They mentioned that for domestic use they also collect ground water supplied by the municipality or by corporation. Amidst these condition three per cent reported that they get an uninterrupted supply of water continuously for three days at a frequency of three days. It was astonishing to find that three per cent were not aware of the frequency of water supply since they were residing in flats and somebody responsible for maintenance would take care of the water supply. The most wretched condition noted is that four per cent of the respondents do not have drinking water facility inside their residential premises. Hence they go to the neighbouring houses to collect drinking water and to street pipes for domestic use. Among the selected samples 23 per cent required only less than one hour to collect water due to short frequency in supply of water. Forty seven per cent of household spent around one to two hours, 14 per cent spent two to three hours and two per cent required more than four hours for fetching water. It has been recorded that 14 per cent of selected households did not fetch water as they pump water to the overhead tank from the sump and purify it for drinking. One of the important household chores which require time is collection of water and is estimated by the pressure and frequency of water supply.

3.1.4 **Person** *Involved in the Collection of Water*

It is true in all over India that at the domestic level, women are the primary water managers both in rural and urban areas. As well as they educate their children on the rules to use water and for a better water management at home. The table below presents the relevant aspects. As far as the person involved in water collection, homemakers played

Table 1: Type and Size of the Family

Family System		Type of Family			Size of the Family (in members)				
		Joint	Nuclear	Extended	2	3	4	5	More than 5
Family headed by men (n=94)	No	25	69	-	21	21	32	16	4
	(%)	27	73	-	22	22	34	17	4
Family headed by women (n=6)	No	3	2	1	-	2	3	-	1
	(%)	50	33	17	-	33	50	-	17

Table 2: Age of the family head and women status (n=94)

Age Frequency	Family headed by men *(n=94)*		Occupational Status of Homemakers	Family headed by men	
	Number	Percentage		Number	Percentage
Below 30	3	3.2	Homemakers	51	54.2
31 – 40	20	21.2	Working women	37	39.4
41 – 50	26	27.6	Not Applicable	6	6.4
Above 50	45	47.9			

Table 3: Frequency of Fetching Drinking Water and Time spent for the collection (n=100)

Frequency of Water Supply		Time spent to collect water	
Frequency of Drinking Water Supply	**Percentage (%)**	**Time spent (in hrs)**	**Percentage (%)**
1 – 5 Days	23	Less than 1 hour	23
6 – 10 Days	41	1 – 2 hours	47
11 – 15 Days	12	2 – 3 hours	14
16 – 20 Days	8	4 hours	2
>20 Days	6	Do not fetch water	14
3 days continuous supply	3		
Not aware	3		
Collect from outside	4		

Table 4: Person involved in the collection of water

Person involved in collection of water (n=100)		Status of women in families where men involved in collection of water (n=26)		
Description	**Percentage**	**Description**	**Number**	**Percentage**
Homemaker	64*	Full time homemaker	14	54
Head of the family	26*	Employed homemaker	8	31
Son	3*	Widower	4	15
Maid	3*			
Other family members	13*			
Do not collect water	14*	* *Multiple Responses*		

a major role in 64 per cent of the families surveyed. It is appreciable to note that 26 per cent of head of the family involved themselves, for the activity.

Among the 26 per cent, in which men take up the responsibility of water collection 15 per cent did not have any option since they were widower, among the rest around 54 per cent were fulltime homemakers whereas 31 per cent of women were employed, hence the husbands had to help them in fetching of water. This shows the changing scenario of men trying to share the household responsibilities of women.

4. CONCLUSION

Not only at the domestic level, women are also under-represented in the place of careers, training and prospects which is dominated by men. An efficient water management is to be democratic, transparent and focus on the needs of the people. The family has been going through a new dimension of transformation and changes in recent times, both men and women must have an equal say. Almost all women wish to have their equal opportunities, rights and access in the society. Based on the findings of the study it is evident that men are trying to give equal right, shares, opportunities and freedom for women in modern families by sharing few household chores like fetching of water. The paper projects transformation towards greater equality among men and women from social inequality.

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III Water Works, Gomti Nagar, Lucknow

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Indian Water Works Association
MCGM Compound, Pipeline Road,
Vakola, Santacruz (East),
Mumbai - 400 055.
Tel.: +91-22-26672665, 26672666
Fax: +91-22-26686113
Email: editoriwwa@gmail.com
iwwa@rediffmail.com
iwwahq@gmail.com
Website: www.iwwa.info

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Water Management Practices among Urban Households of Coimbatore City, Tamil Nadu – A Case Study

J. Sofia Jannet

Teaching and Research Fellow, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore – 641043, Taminadu, India.
Email: sofiajannet@gmail.com; Mobile: +91 98438 70005

M.R. Thilakam

Professor and Head, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore–641043, Tamilnadu, India.
Email: dr.m.r.thilakam57@gmail.com; Mobile: +91 99445 25027

Abstract: *The study was carried out in the state of Tamil Nadu and Coimbatore city. The research was conducted from January to March 2022. Three hundred households were chosen to conduct the survey adopting convenience sampling. The data was collected through a structured interview schedule. This micro-level study was initiated with the criteria to explore the drinking water availability, collection, standard storage methods using different water storage containers, the frequency of stocking drinking water, and the quality of water saved for future consumption. The impact of socio-economic factors on willingness to pay for better water quality of drinking water was analyzed using logistic regression.*

Key Words: *containers, quality, urban households, water, water availability*

1. INTRODUCTION

On the Earth, water is the most important component of the existence of life. We get water in the form of rain, and it not only sustains and nourishes our own life and fecundity but also the life of all other living things, including plants, and animals. Globally, there are worries about the supply of water that is suitable for human consumption. Analysis conducted by the World Bank (2019) indicates that the percentage of the whole population that has access to clean water for drinking has grown since the crisis in Sustainable Development Goals (SDG). Nevertheless, despite all of these efforts, people continue to deal with subpar water quality, which poses a threat to human wellbeing.

India has plentiful rainfall for five to six months. The June-September monsoon season contributes to 80 percent of India's yearly precipitation. The government cannot store extra water during the dry season due to storage constraints. Due to erratic seasonal rainfall, little progress has been achieved in constructing improved capturing and storage infrastructure. More than 50 percent of the world's population is concerned about deteriorating drinking water. A total number of 1.2 million children die each year from water-related disorders caused by polluted water. In India, the water-borne disease kills one lakh people annually. Water is polluted by a variety of causes, including pollution from the atmosphere, industry, transportation, rain, wastewater discharge, fertilizers, pesticides, and poor human waste disposal. Even bottled water contains contaminants. Water quality and purity may directly threaten our ecosystem's health.

According to the United Nations, by 2050 around six billion people would lack access to drinkable water (Boretti and Rosa 2019). Chalchisa et al. (2018), states that "it is imperative to study the origins of water pollution". Numerous studies, mostly from developing countries, have shown the impact of drinking water storage on water quality. For instance, (Schafer, 2010; Mohanan et al. 2017; Douhri et al., 2015) have focused on the effects of water storage container material on water quality, whereas (Agensi et al. 2019), and (Manga et al. 2021) have focused on the effects of user behavior on stored water quality. From March to June, water shortage and water storage are the most often reported problems, with a strong correlation to the presence of larva during those months. Due to water shortage, water storage techniques have a substantial correlation with larval indices, indicating that incorrect water storage practices might serve as a mosquito breeding ground and contribute to the spread of vector-borne illnesses. The fact nonplussed us that the pureness of water keeps scaled down during transport and stock at home level. This thought has kindled the investigator to initiate a micro-level study on "Water management practices among urban households of Coimbatore District".

2. OBJECTIVES OF THE STUDY

The research was ventured by the investigator with the objective to study the social and demographic characteristics of the respondents, identify the universal storage methods and the frequency of stocking drinking water in selected households, to find out the general

materials of containers used in safe storage of drinking water and to discuss willingness to pay for better water quality by the respondents.

3. METHODOLOGY

The research was conducted in the state of Tamil Nadu, and the city of Coimbatore was chosen as the research location. The city was divided into five parts namely North, South, East, West, and Central zones. West zone was selected randomly and three hundred samples of households were chosen to conduct the survey adopting convenience sampling.

A well-planned interview schedule was used to conduct the household survey from January to March 2022 to collect the necessary data. The researcher chose homemakers as the research samples because women bear the majority of the responsibility for managing water supplies, and health concerns in their houses and are eager to engage in activities that would enhance their living circumstances.

As per Coimbatore City Municipal Corporation (2017), a report in the selected study area drinking water from Siruvani was supplied once in two days and once in three to four days for Pilloor supply systems. The quantity gives only 66 litres (average) per capita per day and is distributed to the city's residents once in four to twelve days whereas the standard quantity was 135 litres per day according to the Ministry of Housing and Urban Affairs, New Delhi. Therefore an attempt was also made to analyse the water supply frequency in the selected zone of the city. The data was collected and recorded and the researcher used SPSS version 25 for analysis.

3. SALIENT FINDINGS OF STUDY

Table.1 illustrates the respondents' socioeconomic and demographic traits. It shows that 66 percent of respondents were female and 34 percent were male. About 37.67 percent were between the ages of 30-40, 31.67 percent were between 20-30 years, 21.67 percent were under 20, and nine percent were above 40. Investigation regarding the family type of respondents revealed that 56 percent belonged to nuclear families and 44 percent lived in joint families. A total of 59 percent had more than five family members, while 41 percent had less than five. Around 43 percent of respondents had completed post-graduate education, 32.67 percent were graduates which shows that there is an increase in the educational status of the homemakers, and 24 percent had completed elementary school education. Regarding their career, 44 percent of respondents were working in the private sector, 31.67 percent in the public sector, and 24.33 percent were self-employed.

The respondents' social and demographic features revealed that the majority of respondents were female, as women were available during the survey. The respondents were between the ages of 30 and 40, and a major part of the respondents lived in nuclear families with five members. In addition, the educational information revealed that most of them were postgraduates and employed in the private sector.

Table 1: Social and demographic characteristics of the respondents (n=300)

Sr. No.	Characteristics	No. of Respondents	Percentage
1	**Gender**		
	Male	102	34
	Female	198	66
2	**Age**		
	Less than 20	65	21.67
	20-30	95	31.67
	30-40	113	37.67
	More than 40	27	9
3	**Family type**		
	Joint	132	44
	Nuclear	168	56
4	**Family size**		
	Less than 5	123	41
	More than 5	177	59
5	**Education**		
	Primary to Higher Secondary	72	24
	Graduate	98	32.67
	Post-Graduate	130	43.33
6	**Occupation**		
	Private	132	44
	Government	95	31.67
	Business	73	24.33

Source: Primary Data (2021) collected by the researcher

3.1. Water Availability and Storage

In the study, the researcher attempted to comprehend the water availability and water storage methods of the respondents & outcome of the same is shown in Table 2.

Source of drinking water details showed that among the selected respondents, 44 percent of the households had their soft water supply provided by the corporation inside their house premises and 29 percent had to rely on an additional source of water searching for street/common connections as well as bore-well to balance their shortage of water when water was supplied once in every ten days. A total of 26.3 percent of respondents receive water once every 3 to 6 days, 22.34 percent once every 7 to 10 days, and even more than 10 days. Seasonal variations have a significant impact on water distribution. During the summer, due to the high demand for water, the distribution cycle takes longer than 10 days, despite the fact that the data shows that water was delivered daily and on alternate days during the non-seasonal period. Details on the duration of water supply showed that 25.33 percent got water for a duration of 2 to 3 hours, 20.37 percent received water for 3 to 4 hours, 22.33 percent received water in less than one hour, and 12

percent received water for more than 4 hours. It is clear that the water has been supplied for more than 2 hours. The reason that the water pressure would be low is that the amount of water supplied was not sufficient. Less than 5 feet distance was covered by 33 percent of respondents to collect water, while 26 percent walked between 5 and 10 feet, 23 percent walked between 10 and 20 feet, and 18 percent of the surveyed families live more than 20 feet away from a close water source. Thus, the data clearly demonstrated that the time spent on fetching water increased when there was a scarcity, water demand, and during the condition of insufficiency and the distance between the source and the house.

Table 2: Water supply details (n=300)

Sr. No.	Particulars		No. of Respondents	Percentage
1	Source of drinking water	Own Pipe Connection – Soft Water	97*	32.33
		Street Pipe Connection - Soft Water	118*	39.33
		Borewell – Hard Water	85*	28.34
2	Frequency of Drinking Water Supply	Daily	87	29.00
		Alternate	67	22.33
		3 – 6 days	79	26.33
		7 – 10 days	38	12.67
		More than 10 days	29	9.67
3	Duration of water supply	<1 hour	67	22.33
		1 - 2 hours	59	19.67
		2 - 3 hours	76	25.33
		3 - 4 hours	62	20.37
		> 4 hours	36	12.00
4	Distance of the dwelling from water source	< 5 feet	99	33.00
		5 - 10 feet	78	26.00
		10 - 20 feet	69	23.00
		> 20 feet	54	18.00
5	Time taken to fetch water	< 15 minutes	67	22.33
		15 - 30 minutes	94	31.33
		30 minutes -1hr	98	32.67
		>1hr	41	13.67

*Source: Primary Data (2021); * Multiple Response*

Table 3: Practices of drinking water storage (n=300)

Sr. No.	Particulars		No. of Respondents	Percentage
1	Materials of containers used for water storage	Aluminum	64	21.33
		Brass	29	9.67
		Copper	37	12.33
		Mud	45	15.00
		Plastic	69	23.00
		Stainless Steel	56	18.67
2	Cleaning of container	Daily	78	26.00
		Alternate days	99	33.00
		Whenever water gets supplied	123	41.00

Source: Primary Data (2021)

Water storage and container cleaning are critical considerations since they have a significant impact on the health of users. The materials of containers used for water storage by the chosen respondents' are shown in Table 3. It shows that a maximum of 23 percent of respondents chose plastic containers because they are easily accessible, convenient to maintain, and cost-effective. Nonetheless, plastic containers have a number of negative side effects that individuals are aware of but unable to accept. Even though copper and brass are expensive metals, 12.33 percent were using copper containers, and 9.67 percent were storing water in brass containers understanding

the benefits of using those containers. The frequency of container cleaning revealed that among chosen respondents, 41 percent clean the water storage container only when the water is supplied since they were not able to portion out their time in between their schedule of work. On alternate days 33 percent of the respondents clean their containers used for water storage, and 26 percent clean containers every day after the consumption of water in the container. It was also noticed that among the respondents, many are prone to clean their containers simply whenever they get water supply that ranges from 7 – 10 days or even more.

Table 4: Water Quality and Purification Methods (n=300)

Sr. No.	Particulars		No. of Respondents	Percentage
1	Physical quality of water	Clean	62	20.67
		Dark colour	72	24
		Muddy	68	22.67
		Smelly	98	32.67
2	Adaptation of water purification	Yes	241	80.33
		No	59	19.67
3	Existing Water purification methods	Strain by cloth	39	13
		Water filter	71	23.67
		Boiling	89	29.67
		Electric water purifier	42	14
		No purification	59	19.66

Source: Primary Data (2021)

The quality of water obtained from the homes of chosen respondents was evaluated. According to Table 4, the physical characteristics of the supplied water are as follows: only 20.67 percent of respondents reported that their water was clean, whereas 32.67 percent believed their water to be odorous, and 24 percent said their water is blackish, and 22.67 percent said their water is muddy. A total of 80.33 percent of the respondents employed in purifying water using their own way of water purification technique, whereas 19.66 percent did not use any sort of Dependent variable: Willingness to Pay water treatment because they are satisfied with the quality of water provided for consumption and also there were respondents who expressed that they were busy with their regular work routine and lack time to engage themselves in the purification process. Respondents among those who said that they purify their water, 29.67 percent boiled their drinking water prior to use, 23.67 percent used a traditional style of water filter (with candles), 14 percent used an electric water purifier, and 13 percent used a muslin cloth to strain their water since they follow the traditional way of water filtration methods.

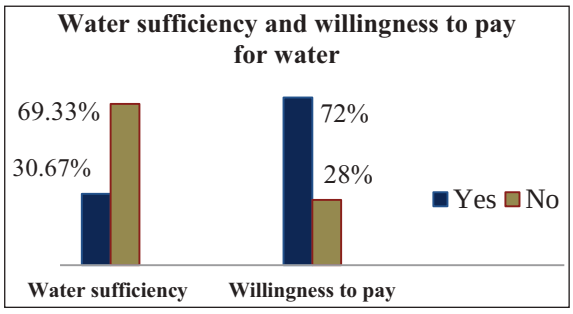

Fig.1 *Water sufficiency and willingness to pay for water*

The amount of water available in the research region was measured to determine sufficiency. Although each distribution cycle supplies water to homes for more than 4 hours, 69.33% of respondents said it wasn't enough because of poor water flow and pressure. However, 30.67% of respondents said they had an adequate water supply.

To investigate the impact of socioeconomic status on the willingness to pay for water, logistic regression was used with the dependent variable being the respondents' willingness to do so. Family size, age, education, employment, and income impact respondents' willingness to pay for drinking water.

Among the selected respondents 72 percent said that they are willing to pay for good quality and quantity of water for their improved lifestyle, whereas 28 percent reported that they do not want to spare amount for water services. They felt that it is the duty of the government to ensure and provide good quality water to the public. The researcher has utilized the logit model to evaluate willingness to pay and social and demographic relationships. The result of this can be seen in the following Table 5.

The predicted logit model fits the statistical perspective well; the χ^2 value was significant at a 1 percent level. Nagelkerke R^2 value suggests nearly 75 percent of the fluctuations estimated by the logistic model. Similarly, 62 percent of precisely predicted cases was also high. The probability of willingness to pay for better water service increases due to age (P=0.007), education (P=0.000), occupation (P=0.005), monthly income (0.039), family size (P=0.007) and place of residence (P=0.012). All these variables are statistically significant at 1 percent level of significance, indicating a willingness to pay is related to the social and demographic characteristics of the respondents.

Table 5: Logistic Regression

Sr. No.	Variable	B	S.E.	Sig.	Exp (B)
1	Age	0.31	0.29	0.007*	0.33
2	Education	0.07	0.38	0.000*	0.04
3	Occupation	0.41	0.52	0.005*	0.42
4	Income	1.01	0.52	0.039*	1.03
5	Family Size	1.01	0.42	0.007*	1.05
6	Place of Residence	0.86	0.62	0.012*	0.78
7	Constant	3.28	1.11	0.008	26.00
8	Nagelkerke R^2	0.75			
9	Hosmer and Lemeshow test (χ^2)	4.13			
10	n	300			
11	Classification percent	62			

Dependent variable: Willingness to Pay

4. CONCLUSION

The primary data showed that where water shortage and needs arise, the time spent to fetch water has also increased. Despite the fact that each distribution cycle provides residents with water for more than 4 hours, 69.33% of respondents said that this was insufficient due to the low water flow and pressure. A total of 80.33 percent of the respondents purified water using their own water purification techniques, whereas 19.66 percent did not use any sort of water treatment because they are satisfied with the quality of water provided for consumption, and some respondents stated that they were too busy with their regular work routine to engage in the purification process. Rest 80.33 percent has an impression that the water quality was poor. The probability of willingness to pay for better water service increases due to age (P=0.007), education (P=0.000), occupation (P=0.005), monthly income (0.039), family size (P=0.007) and place of residence (P=0.012). The predicted Logistic model fits the statistical perspective well; the χ^2 value was significant at 1 percent level. All these variables are statistically significant at 1 percent level of significance, indicating the willingness to pay for water supply and was influenced by the social and demographic characteristics of the respondents.

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