International Journal of Arts and Social Science www.ijassjournal.com
ISSN: 2581-7922,
Volume 8 Issue 6, June 2025

Economic Aspect of Domestic Water Consumption and Sanitation: A Case Study from Rural Households of Pollachi Taluk of Coimbatore District

Dr. R. Manikandan[1], K. Sowmitha[2*], Dr. N. Vidhya[3], M. Tamilarasi[2], R. Keerthi kumar[2]

[1] *Assistant Professor, Department of Economics, Bharathiar University*
[2] *Ph. D. Research Scholar, Department of Economics, Bharathiar University*
[3] *Assistant Professor, Department of Economics, NGM College*

Abstract: *Water has been considered the most valuable factor for human survival, particularly for domestic use in households and it is also considered the most valuable natural resource in the world. India possesses four percent of the world's freshwater resources and sixteen percent of the world's population. India faces significant challenges regarding access to clean water and the prevalence of open defecation, posing serious public health and environmental concerns. Open defecation is one of the major problems among rural people in India, for this problem, the Government has introduced the Swachh Bharat Abhiyan (Clean India Mission),which has been launched to accelerate progress towards achieving universal access to sanitation and eradicate open defecation. Hence, this study mainly focused on the water consumption, availability of domestic water, and sanitation in selected areas of the Kullakapalayam and Pothanur villages of Pollachi taluk, Coimbatore district. This study has used primary data. Random sampling techniques were applied to select the sample households. A total of 69 sample households have been selected from two villages. This study found that there was an adequate supply of drinking water in Pothanur village and Kullakapalayam village. Suffering from an inadequate supply of water, and there was an additional source of water consumed regularly. Almost all the respondents had sanitation facilities through the Swachh Bharat scheme.*

Keywords: *Clean India Mission, Water Consumption, LPCD, Sanitation, Swachh Bharat*

I. Introduction

Access to clean drinking water and sanitation is crucial for human survival. However, in India1, this remains one of the biggest challenges, especially in the year 2050, according to the World Economic Forum. Water quality issues arise due to pollution and over-exploitation. Rural areas in India are home to more than 700 million people, living in about 1.42 million habitations spread over 15 diverse ecological regions. Providing clean drinking water to such a large population can be overwhelming (Water Aid, 2021). Over 92 percent of the groundwater was extracted and used for agricultural purposes, and only 3 percent was used for the domestic sector and individuals. India has made rapid progress in ending defecation across the country, significantly improving water, sanitation, and hygiene. A great achievement was possible only because of the Government's flagship program, the Swachh Bharat Mission (UNICEF, 2019)[1]. The Swachh Bharat Mission was launched by

[1]United Nations Children's Fund (UNICEF), (2019). Ascertain the Impact of the achievement of Open Defecation Free (ODF) status, on the incidence of Environmental Contamination. 14011819/1/334

the Government of India, with a mission to accelerate rural sanitation coverage, reduce open defecation, and improve the management of solid and liquid waste in rural areas. Tamil Nadu is a water-stressed state that relies heavily on the monsoon season for irrigation and drinking water. In the eleventh five-year plan, 3002 crore rupees were allocated for the rural water supply and in the Coimbatore district, more than 1 lakh people benefited (TWAD)[2]. Furthermore, Pollachi has witnessed significant progress in terms of implementing house service connections, sanitary infrastructure, and cleanliness habits, which are key components of public health and well-being. Therefore, this study analyses the socio-economic conditions of the respondents, water consumption patterns, and spending behaviour of water and sanitation in Pollachi taluk.

II. Review of Literature:

Vidhyadharan (2023) evaluates the disparities in drinking water and sanitation in the urban slum of Kerala, India. In this study, the absolute disparity method is used for comparative analysis. This study figured out that there is a significant difference in the average preference for the primary source of drinking water. Kerala's achievement in waste management, both solid and liquid, is not up to the standard that is visible in this study. It suggested the local self-government plan long-term policies at the city level to maintain resilience and achieve sustainability.

Boopathi and Manikandan (2018) elucidated the determinants of the consumption of water in rural areas. A multistage, systematic, stratified, proportionate random sampling method is used for selecting the sample village. The linear regression model was used to determine the average water consumption by households, and it analysed the number of schemes executed by different agencies in the Coimbatore district. This study found that there are positive results in the hilly areas, and wet areas except those in dry areas.

Chakkaravarthy and Balakrishnan (2019) analyzed water scarcity and challenges future. This study erratic development plans mean our future generation is under

Major threat, sustainable development plans mean our future generation is saved from such major threat and endurable development is the hour of need. It also highlights the importance and threats of water scarcity and the challenges that will be faced by future generations. This paper attempted to investigate and discuss the details of water scarcity and its problem and overcome this problem because the world, as well as India, has an alarming situation due to this problem.

Manikandan and Bhuvanesvari (2022) enlightened them about the consumption of water and sanitation. This study mainly focuses on analyzing the community-wise average water consumption, water sources, water quality, and sanitation facilities available, especially for a beneficiary under the Swachh Bharat scheme in Pasur village of Coimbatore district. Both primary and secondary data have been used. The ground reality of Pasur village is water requirements of households for various consumption are much higher than Government norms.

Rajat et.al (2019) this study discussed the water shortage challenges and the way forward in India. This study says that the major causes of water scarcity are overconsumption of water, overpopulation, changes in monsoon water shortage, and water pollution. The main idea behind the smart city concept is to promote mixed land use in area-based developments— planning, as it were, for "unplanned areas" containing a range of compatible activities and land uses close to one another to make land use more efficient.

III. Objectives

- To analyze the socio-economic condition of the sample respondents.
- To examine the average water consumption and source of water consumption.
- To investigate the sanitation facility in the study area.

[2]Tamil Nadu Water Supply and Drainage Board (TWAD)

IV. Methodology

The Pollachi Taluk of Coimbatore district was selected for the study. Pollachi taluk is considered one of the rural population areas in the Coimbatore district. Primary data have been used for the study. The simple random sampling technique was adopted to collect the primary data. In Kullakapalayam village,46 sample respondents were selected randomly, and 23 samples were selected randomly from Pothanur village, total 69 samples were collected in the both village randomly. For this study, the average, percentage and Mann-Whitney test have been used for this study. The Mann-Whitney 'U' test was used to find the following hypothesis.

H_{01}: There is no significant difference on the mean rank of Pothanur and Kullakapalayam village with respect to family size, family income, expenditure, water distribution frequency level, external water source and LPCD.

V. Data Analysis and Discussion

Table 1: Socio-economic condition of the respondents

Particulars	***Kullakapalayam***	***Pothanur***	***Total***
Age			
Below36	13(28.30)	4(18.20)	17(25.00)
36 – 55	25(54.30)	9(40.90)	34(50.00)
Above56	8(17.40)	9(40.90)	17(25.00)
Education status			
Illiterate	11(23.9)	4(18.2)	15(22.1)
Graduate	8(17.4)	0 (0)	8(11.8)
Primary	16(34.8)	10(45.5)	26(38.2)
Secondary	8(17.4)	5(22.7)	13(19.1)
Higher Secondary	3(6.5)	3(13.6)	6 (8.8)
Marital status			
Married	37(80.40)	14(63.60)	51(75)
Unmarried	1(2.20)	1(4.50)	2(2.90)
Widow	8(17.40)	6(27.30)	14(20.60)
Divorce	0 (0)	1(4.50)	1(1.50)
Caste			
SC	3(6.5)	7(31.8)	10(14.7)
BC	38(82.6)	13(59.1)	51(75.0)
MBC	5(10.9)	2(9.1)	7(10.3)
Average Yearly income and expenditure			
Size of the family	3.67	3	3.46
Income	Rs.89739.1	Rs.76454.6	Rs.85441.2
Expenditure	Rs.82943.9	Rs.55851.8	Rs.67414.1

Source: Primary data (2023)

Table 1 indicates the socio-economic condition of sample respondents in Kullakapalayam, and Pothanur village. The age of the respondents indicates that, in Kullakapalayam village, the majority 54.30 percent of the respondents belonged to the 36 - 55 age group, and in Pothanur village majority 40.90 percentages of the respondents belonged to the 36 - 55 age group, 55 above aged respondents. This denoted that in an overview the table concludes that the majority 50 percent of respondents belong to the 36 to 55 age group. The education status of the respondents reveals that in Kullakapalayam village the majority 35 percent

of the respondents had a primary level of education, and in Pothanur village majority 45.5 of the respondents had a primary level of education. This reveals that the overall education in the selected village 38.2 percent of them had a primary level of education, and followed by 22 percent of the respondents were illiterate. The marital status of the respondents denotes that in Kullakapalayam village majority 80.40 percent of respondents are married and in Pothanur village majority 63 percent of the respondents are married. This shows an overview of marital status in both villages which shows that the majority, 75 percent of the respondents, were married. The caste of the respondents represents that in Kullakapalayam village majority of 82.6 percent of the respondents belong to BC (backward cast), and in Pothanur village majority of 59 percent of the respondents belonged to BC. The overall cast of the respondents in both villages shows that the majority 51 percent of the respondents belonged to the Backward cast, followed by 15 percent of the respondents belonging to the Scheduled cast and 10 percent of the respondents belonged to the Most Backward cast. The average family size of the respondents indicates that in Kullakapalayam village the average family size was 4 members, in Pothanur village average family size of the respondents was 3 members. The average family size in the villages shows there were 3 members in the family. The income of the respondents reveals that in Kullakapalayam village the average annual income of the respondents was Rs. 89,739 and in the Pothanur village the average annual income of the respondents was Rs. 76,454. This reveals that the average annual income of the respondents was Rs. 85,441. The average family expenditure of the respondents reveals that in Kullakapalayam village the average family annual expenditure was Rs. 72,944 and in Pothanur village the average family annual expenditure was Rs. 55,851. This denoted that the average family's annual expenditure was Rs. 67,414, there is a difference in the spending behaviour in both the villages.

Table 2: Total water consumption per day and per capita of water per consumption per day

Name of the Village	Statistics	drinking water	cooking water	bathing water	washing utensil	washing cloth	cleaning house	entrance	livestock purpose	ablutions	gardening	vehicles	Total water usage	Total usage norms	average usage	LPCD
Kullakapalayam	Sum	1421	1738	2070	1440	3431	1191	417	1364	998	524	311	14905	11098	4487	3378
	Mean	**30.89**	**37.78**	**45.00**	**31.30**	**74.59**	**25.89**	**9.07**	**29.65**	**21.70**	**11.39**	**6.76**	**324.02**	**241.26**	**97.55**	**73.43**
	N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
Pothanur	Sum	718	974	1396	775	1716	604	282	0	424	324	261	7474	6003	2818	2280
	Mean	**32.64**	**44.27**	**63.45**	**35.23**	**78.00**	**27.45**	**12.82**	**0.00**	**19.27**	**14.73**	**11.86**	**339.73**	**272.86**	**128.10**	**103.63**
	N	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Total	Sum	2139	2712	3466	2215	5147	1795	699	1364	1422	848	572	22379	17101	7305	5658
	Mean	**31.46**	**39.88**	**50.97**	**32.57**	**75.69**	**26.40**	**10.28**	**20.06**	**20.91**	**12.47**	**8.41**	**329.10**	**251.49**	**107.43**	**83.20**
	N	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68

Source: Primary data

Table 2discusses the total water consumption per day and per capita water consumption per day of Kullakapalayam and Pothanur village for different purposes. In Kullakapalayam village averagely they consuming the 324.02 litres and per person in a family were consuming 73.43 litres in a day, washing the cloth and bathing purpose highest portion of the water (i.e., 74.59 litres and 45 litres). In the Pothanur village, respondents were averagely spending 339.73 litres and per person was consuming 103.63 litres in a day. The Pothanur village respondents were highly consuming water for washing cloth and bathing purpose which is average of 78 litres and 63.45 litres. The average rural norm was 35 litres, and in both villages, they are getting adequate water according to the government norms, but Kullakapalayam village gets less water supply than the Pothanur village. The consumption of water is adequate in the both the village but in the **Table 3** shows the supply of water is not adequate. Supply does not meets the demand.

Table 3: Water collected from HSC and interval received the drinking water

Name of the Village	Statistics	Water collected through HSC	Frequency of receiving the drinking water
Kullakapalayam	**Sum**	34035	953
	Mean	**739.89**	**20.72**
Pothanur	**Sum**	13860	113
	Mean	**630.00**	**5.14**
Total	**Sum**	47895	1066
	Mean	**704.34**	**15.68**

Source: Primary data

Table 3indicates the water collected from the house services connection and the frequency of receiving the drinking water through the house service connection. All the respondents in both the villages have House Service Connection (HSC). In Kullakapalayam village, they receive drinking water for 21 days once and they get 739.89 liters of water. In Pothanur village they receive water for 5 days once and they get 630 liters of water. In the Kullakapalayam village, they suffer from an inadequate supply of water, as per the Government norms the LPCD is 40 liters but in this case, the Kullakapalayam village respondents receive only 35 liters per day. The frequency of receiving the water differs in both villages.

Table 4: Additional sources of water, frequency of purchasing and the amount spent by the respondents

Name of the village	Buy lorry water		Total	Statistics	Frequency of purchasing a lorry of water	External source of water (in liters)	Amounts spend on External water
	Yes	No					
Kullakapalayam	**13**	**33**	**46**	Sum	124	60000	303962
	(28.3)	(71.7)	(100.0)	Mean	**9.54**	**4615.38**	**23381**
	[100.0]	[60.0]	[67.6]	N	13	13	13
Pothanur	**0**	**22**	**22**	Sum	0	0	0
	(0.0)	(100.0)	(100.0)	Mean	**0**	**0**	**0**
	[0.0]	[40.0]	[32.4]	N	0	0	0
Total	**13**	**55**	**68**	Sum	124	60000	303962
	(19.1)	(80.9)	(100.0)	Mean	**9.54**	**4615.38**	**23381**
	[100.0]	[100.0]	[100.0]	N	13	13	13

Source: Primary data

Table 4 indicates the external source of purchasing the water and the frequency of receiving the lorry water. In Kullakapalayam village 28.3 percent of the respondents were purchasing lorry water at a frequency of 10 days once because the respondents in Kullakapalayam village getting water at a frequency of 21 days once (**Refer Table 3)**, so they need an external source of water, and they purchase 4615.38 liters of water at the cost of Rs.23381 in a year. In Pothanur village no respondents have purchased an external source of water, there is an adequate supply of water facilities. The Kullakapalayam village respondents were spending 20 percent of their income annually to purchase lorry water.

Table5.Availabilityoftoiletintherespondent'shouse

Name of the Village	Availability of toilet		Source of Water for sanitation				Total
	Yes	No	Bore water	Well Water	Tank water	Canals	
Kullakapalayam	44 (95.7) [67.70]	2 (4.3) [66.70]	16 (34.8) [72.7]	24 (52.2) [66.7]	6 (13) [100]	0 (0) [0]	**46** (100) [67.60]
Pothanur	21 (95.5) [32.30]	1 (4.5) [33.30]	6 (27.3) [27.3]	12 (54.5) [33.3]	0 (0) [0]	4 (18.2) [100]	**22** (100) [32.40]
Total	65 (95.6) [100]	3 (4.4) [100.00]	22 (32.4) [100]	36 (52.9) [100]	6 (8.8) [100]	4 (5.9) [100]	**68** (100) [100.00]

Source: Primary data

The availability of sanitation and the source of water used for sanitation are indicated in Table 5. In Kullakapalayam village the majority 95.7 percent of the respondents have toilet facilities and 4.3 percent of the respondents do not have toilet facilities in their houses. In Pothanur village the majority 95.5 percent of the respondents have toilet facilities and 4.5 percent of the respondents do not have toilet facilities in their houses. The respondents did not have toilet facilities and were using the government toilets and a neighbor's house. In Kullakapalayam village the main source of water used for sanitation is well water of 52.2 percent followed by 34.8 percent use bore water. This table concludes that the majority 96 percent of the respondents had sanitation in their houses because of the *Swachh Bharat Scheme* mostly everyone has a toilet facility, and they use well water as the major source of water sanitation purpose.

I MANN-WHITNEY 'U' TEST (Equivalent Parametric Test Independent sample 't' test)

H_0 : There is no significant difference on the mean rank of Pothanur and Kullakapalayam village with respect to family size, family income, expenditure, water distribution frequency level, external water source and LPCD.

Factors	Village	Mean Rank	Sum of Ranks	Z	p-value
Family Size	Pothanur	45.50	1046.50	-3.156	0.002
	Kullakapalayam	29.75	1368.50		
Family income	Pothanur	26.13	601.00	-2.607	0.009
	Kullakapalayam	39.43	1814.00		
Expenditure	Pothanur	17.63	405.50	-5.086	<0.001
	Kullakapalayam	43.68	2009.50		
Water distribution frequency	Pothanur	12.00	276.00	-6.852	<0.001
	Kullakapalayam	46.50	2139.00		
External Water Source	Pothanur	12.00	276.00	-6.919	<0.001
	Kullakapalayam	46.50	2139.00		
LPCD	Pothanur	58.00	1334.00	-6.803	<0.001
	Kullakapalayam	23.50	1081.00		

Source: Computed data

It can be concluded that from the above table that family size has a mean rank of 45.50 in Pothanur village and 29.75 in Kullakapalayam village with a z vale of -3.156 and it shows 1 per cent level of significant. Family income has a mean rank of 39.43 in Kullakapalayam and 26.13 in Pothanur village with a z value of -2.607 and it shows 1 per cent level of significant. The expenditure level has mean rank of 43.68 in Kullakapalayam and 17.63 in Pothanur village with a z value -5.086 and it shows less than 1 per cent level of significance. The water distribution level has mean rank of 46.50 in Kullakapalayam and 12.00 in Pothanur village with a z value -6.852 and it shows less than 1 per cent level of significance. The external source of water has mean rank of 46.50 in Kullakapalayam and 12.00 in Pothanur village with a z value -6.919 and it shows less than 1 per cent level of significance. The LPCD has mean rank of 58.00 in Pothanur and 23.50 in Kullakapalayam village with a z value -6.803 and it shows less than 1 per cent level of significance.

The effect of family size and LPCD in Pothanur village is high when compare to Kullakapalayam village. The effect of Family income, expenditure level, water distribution frequency and external water in Kullakapalayam village is higher compare to Pothanur village. So than the null hypothesis is rejected and alternative hypothesis is accepted.

VI. Conclusion

Resource management, particularly water, is a key challenge to urban sustainability. The supply of adequate water is essential to ensure healthy urban living, but access to clean water still evades millions of people around the globe (**WHO and UNICEF, 2021**). The paper concluded that the Kullakapalayam village people were not getting an adequate supply of water compared to Pothanur village people were getting an adequate supply of water. The respondents in Kullakapalayam village were spending 20 percent of their income on buying lorry water annually. Most of the households in both villages have proper sanitation facilities, through the Swachh Bharat scheme and Clean India Mission scheme to avoid open defecation and health issues. Moreover, the effect of family size and LPCD in Pothanur village is high when compared to Kullakapalayam village. The effect of Family income, expenditure level, water distribution frequency and external water in Kullakapalayam village is higher compared to Pothanur village. This study suggests the Government construct more Over Head Tanks and improve pipelines in Kullakapalayam village to get an adequate supply of water in a sustainable manner.

Reference:

[1.] Adler, I. 2011 Domestic water demand management: implications for Mexico City. International Journal of Urban Sustainable Development 3 (1), 93–105.

[2.] Athuraliya, A., Roberts, P. & Brown, A. 2012 Residential Water Use Study. Yarra Valley Water, Mitcham, Australia.

[3.] Australian Standards/New Zealand Standards (AS/NZS) 2016 Water Efficient Products – Rating and Labelling. AS/NZS 6400:2016.

[4.] Bartram, J., Brocklehurst, C., Fisher, M. B., Luyendijk, R., Hossain, R., Wardlaw, T., & Gordon, B. (2014). Global monitoring of water supply and sanitation: history, methods and future challenges. *International journal of environmental research and public health*, *11*(8), 8137-8165.

[5.] Biswas, A. &Gangwar, D. 2020 Studying the water crisis in Delhi due to rapid urbanisation and land use transformation. International Journal of Urban Sustainable Development. doi:10.1080/19463138.2020.1858423.

[6.] Booysen, M. J., Visser, M. & Burger, R. 2019 Temporal case study of household behavioural response to Cape Town's "Day Zero" using smart meter data. Water Research 149, 414–420.

[7.] Bradley, D. 1977 Health aspects of water supplies in tropical countries. In: Water, Wastes and Health in hot Climates (Feachem, R., McGarry, M. & Mara, D. eds.). Wiley, Chichester, UK, pp. 3–17.

[8.] Browne, A. L., Pullinger, M., Medd, W. & Anderson, B. 2014 Patterns of practice: a reflection on the development of quantitative/mixed methodologies capturing everyday life related to water consumption in the UK. International Journal of Social Research Methodology 17(1), 27–43.

[9.] Cairncross, S. (1989). Water supply and sanitation: *Journal of Tropical Medicine and Hygiene*, *92*, 301-314.
[10.] Clayton, S. 2007 Domesticated nature: motivations for gardening and perceptions of environmental impact. Journal of Environmental Psychology 27 (3), 215–224.
[11.] Crouch, M. L. 2020 Stochastic Evaluation of per Capita Domestic Water Requirements in View of Various Lifestyles. Masters Thesis, Stellenbosch University, South Africa. Available from: https://scholar.sun.ac.za/handle/10019.1/107873 (accessed 5 May 2021).
[12.] Department for Environment Food and Rural Affairs (Defra) 2019 Consultation on Measures to Reduce Personal Water use. Available from: https://consult.defra.gov.uk/water/measures-to-reduce-personal-wateruse/supporting_documents/Consultation%20on%20reducing%20personal%20water%20use%20FINAL.pdf (accessed 5 May 2021).
[13.] Department of Human Settlements (DHS) 2019 The Neighbourhood Planning and Design Guide – Creating Sustainable Human Settlements.
[14.] edition with 2016 amendments. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/504207/BR_PDF_AD_G_2015_with_2016_amendments.pdf (accessed 5 May 2021).
[15.] Howe, C. W. &Linaweaver, F. P. 1967 The impact of price on residential water demand and its relation to system design and price structure.Water Resources Research 3 (1), 13–32.
[16.] Hutton, G., Haller, L., & Bartram, J. (2007). Economic and health effects of increasing coverage of low cost household drinking water supply and sanitation interventions. *World Health Organization*.
[17.] Hutton, G., Haller, L., & Bartram, J. (2007). Economic and health effects of increasing coverage of low cost household drinking water supply and sanitation interventions. *World Health Organization*.
[18.] Jacobs, H. E. 2004 A Conceptual End-use Model for Residential Water Demand and Return Flow. Ph.D., Department of Civil Engineering, Rand Afrikaans University (now University of Johannesburg), Johannesburg, South Africa.
[19.] Linaweaver, F. P., Geyer, J. C. & Wolff, J. B. 1963 Final Report on Phase 1 of the Residential Water use Research Project. October 1963. Department of Environmental Engineering Science, Johns Hopkins University.
[20.] Lugoma, M. F. T., Van Zyl, J. E. &Ilemobade, A. A. 2012 The extent of on-site leakage in selected suburbs of Johannesburg. Water SA 38 (1),127–132.
[21.] Makwiza, C. & Jacobs, H. E. 2016 Assessing the impact of property size on the residential water use for selected neighbourhoods in Lilongwe, Malawi. Journal Water Sanitation and Hygiene for Development 6 (2), 242–251.
[22.] Makwiza, C., Fuamba, M., Houssa, F. & Jacobs, H. E. 2018 Estimating the impact of climate change on residential water use using panel data analysis: a case study of Llilongwe, Malawi. Journal of Water, Sanitation and Hygiene for Development 8 (2), 217–226.
[23.] Mara, D., & Alabaster, G. (2008). A new paradigm for low-cost urban water supplies and sanitation in developing countries. *Water policy*, *10*(2), 119-129.
[24.] Maslow, A. 1943 A theory of human motivation. Psychological Review 50 (4), 370–396.
[25.] Meyer, N., Jacobs, H. E., Westman, T. & McKenzie, R. 2018 The effect of controlled pressure adjustment in an urban water distribution system on household demand. Journal of Water Supply: Research and Technology – Aqua 67 (3), 218–226. doi:10.2166/aqua.2018.139.
[26.] Neunteufel, R., Perfler, R., Schwarz, D., Bachner, G., & Bednar-Friedl, B. (2015). Water supply and sanitation. *Economic Evaluation of Climate Change Impacts: Development of a Cross-Sectoral Framework and Results for Austria*, 215-234.
[27.] Sigel, K., Altantuul, K., &Basandorj, D. (2012). Household needs and demand for improved water supply and sanitation in peri-urban ger areas: the case of Darkhan, Mongolia. *Environmental Earth Sciences*, *65*, 1561-1566.
[28.] UNESF (2019) https://www.unicef.org/india/media/1236/file/Environmental-impact-of-SBM-Full-

Report.pdf
[29.] Water Aids (2021) https://www.wateraid.org/publications/wateraid-indias-2021-22-annual-report-0
[30.] World Health Organization. (2006). *Core questions on drinking water and sanitation for household surveys*. World Health Organization.