

Economic Analyses of Water Utilization by the Households in Chidambaram Town

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Abstract: *The use of water for drinking and other domestic purposes by human beings is generally conceded to be its highest and most essential use. The supplies for the domestic use should be pure and wholesome. Inadequate of water supply becomes a prominent role to the household in our country. Hence we have to reduce our consumes of water or we have able to manage the water for that, analyze the utilization of water is more essential part of the town households. This paper extracts the income of the households, occupation of the sample households and utilization of water by the sample households. From this paper our sample households meet their requirements of water and consume economically. This paper explains, the maintained water supply systems, high amount of informal water use and insufficient technical and water management capacities by the households in Chidambaram town. This paper concludes with some interesting policy implications.*

1. INTRODUCTION

Water is one of the most important commodities which Man has exploited than any other resource for the substance of his life. Without water we cannot able to live in the world. As centers of industry and commerce, cities have long been centers of wealth and political power. The world bank has estimated that in the developing world as much as 80 percent of economic growth well occur in towns and cities. Thus urbanization is associated with higher incomes, improved health, higher literacy and improved quality of life. However these benefits of urbanization are associated with environmental and social evils. These include a diversity of problems from lack of access to clean drinking water, to urban air pollution and to green house gas emissions, which are grouped into those associated with poverty and those associated with economic growth or affluence. Indeed over the past two decades the global agenda has shifted away from local and regional problems such as air pollution and inadequate water supplies towards vast global concerns such as ozone depletion, climate change and the less of biological diversity.

2. STATEMENT OF THE PROBLEM

Economic growth brings needed revenues to cities, but if proper safeguards are not in place, it occurs at the expense of environmental quality. Land water become degradable by domestic and industrial effluents are releases to waterways with minimal or no treatment, threatening both human health and aquatic life. The use of water for drinking and other domestic purposes by human beings is generally conceded to be its highest and most essential use. The supplies for the domestic use should be pure and wholesome. Inadequate of water supply becomes a prominent role to the household in our country. Hence we have to reduce our consumes of water or we have able to manage the water for that, analyze the utilization of water is more essential part of the town households. In most of the towns, Can water is more influenced to the people for all our needs by the water vendor. There is no adequate of water to the slum people as well as residential and central block town people at the study area. From this background of ideas, It is the right time to analyse the utilization of water by the people of households and how water is managed by the people of households in the study town.

3. OBJECTIVES

- * To examine the income of the households in the study area
- * To analyze the utilization of water by the households in the study area.
- * To suggest the remedial measures to manage the water by the households through policy suggestions in the study area.

4. HYPOTHESIS

* The distribution of wealth, income and consumption are relatively higher for the residence of central Block town compared to other locations.

* The utilization of water by the households are relatively higher for the residence of central Block town compared to other locations.

5. METHODOLOGY

The present paper will deal with the cost of water consuming and water management by the people of Chidambaram town of Cuddalore district in Tamilnadu. To conduct this research primary data were collected in the town.

In order to ensure the representativeness of the sample, the disproportionate stratified random sampling technique is adopted to select the households from the town in which stratification according to location are made. Towns are divided into three different locations such as slums, Central Block Town (CBT), and Residential area. About 30 households from each of these three locations in Chidambaram town are selected to get a sample of size 90.

In large scale surveys involving a number of households, a few non-response cases are inevitable, either due to absence of co-operation or unwillingness of respondents to give information. Non response cases are tackled by substituting similar households in the population, so that the effective sample size of population will be interviewed by questionnaire cum schedule method. These information are collected through direct field enquiries from effective sample size of 90 households spread over the town will form the data base for the study.

The collected primary data are tabulated on the basis of income level (Low, Middle, High) of households for further statistical analysis. Appropriate statistical tools such as averages, percentage analysis are used to verify the formulated hypotheses.

6. WATER RESOURCE MANAGEMENT

Water Resource Management is the activity of planning, developing, distributing and managing the optimum use of water resources. It is a subset of water cycle management. Ideally, water resource management planning has regard to all the competing demand for water and seeks to allocate water on equitable basis to satisfy all uses and demands. As with resource management, this is rarely possible in practice.

7. MANAGING WATER IN URBAN SETTINGS

As the carrying capacity of the earth increases greatly due to technological advances, urbanization in modern times occurs because of economic opportunity. The rapid urbanization happens worldwide but mostly in new rising economies and developing countries. Cities in Africa and Asia are growing fastest with 28 out of 39 megacities worldwide in these developing nations. The number of megacities will continue to rise reaching approximately 50 in 2025. With developing economies water scarcity is a very common and very prevalent issue. Global fresh water resources dwindle in the eastern hemisphere either than the poles and with the majority of urban development millions live with insufficient fresh water. This is caused by polluted fresh water resources, over exploited groundwater resources, insufficient harvesting capacities in the surrounding rural areas, poorly constructed and maintained water supply systems, high amount of informal water use and insufficient technical and water management capacities. Waste water from cities can contain a mixture of pollutants. There is usually waste water from kitchens and toilets along with rain water runoff. This means that the water usually contains excessive levels of nutrients and salts, as well as a wide range of pathogens. Heavy metals may also be present, along with traces of antibiotics and endocrine disruptors, such as estrogens.

There is a new approach in European countries, that is Urban decision support system (UDSS) –Is a wireless device with a mobile app that uses sensors attached to water appliances in urban residences to collect data about water usage and is an example of data-driven urban water management. The system was developed with a European commission investment of 2.46 million euros to improve the water consumption behavior of households.

Mechanisms like dishwashers, showers, washing machines, taps is wirelessly recorded and sent to the UDSS app on the users mobile device. UDSS is then able to analyse and show home owners which of their appliances are using the most water and which behavior are habits of the households are not encouraged in order to reduce the water usage, rather than simply giving a total usage figure for the whole property, which will allow people to manage their consumption more economically.

In our study area also the people are consuming a lot of water for the various purposes like car washing, bathing, toileting, kitchen garden, dish washing, and all cleaning purposes. To reducing the water consuming we also have to adopt the above UDSS system. It is expensive, but our government have to apply this system in our small town initially, then it is benefitted to all our society. Now the utilization of water by the households and income of the people were analyzed to manage the water in the study town.

LOCATION AND OCCUPATION BY SAMPLE HOUSEHOLDS

LOCATION	PRIVATE SECTOR	PUBLIC SECTOR	SERVICE	BUSINESS	TOTAL
CBT	4(13%)	8(27%)	10(33%)	8(27%)	30
RESIDENTIAL	6(20%)	11(37%)	9(30%)	4(13%)	30
SLUMS	6(20%)	4(13%)	12(40%)	8(27%)	30
TOTAL	16(18%)	23(26%)	31(34%)	20(22%)	90

Source: Computed from primary data

The results on location and occupational distribution of sample respondents are exhibited in the above table. It is seen that 34 percent of households are employed in service sector followed by public sector at 23 percentage, business at 22percentage and at the least private sector of 18 percentage. This shows that the water consuming the households were almost employed in the public and service sectors and at the same time location-wise also major percentage belonged to residential groups of 37 percentage.

LOCATION AND TYPE OF INCOME OF SAMPLE HOUSEHOLDS

LOCATION	UP TO Rs.15000	Rs.15000-Rs.40000	Rs.40,000 and above	TOTAL
CBT	7(23%)	7(23%)	8(26%)	30
RESIDENTIAL	4(13%)	8(26%)	13(43%)	30
SLUMS	25(83%)	2(6%)	1(3%)	30
TOTAL	36(40%)	17(18%)	24(26%)	90

Source: Computed from primary data

L – Low Income M – Middle Income H – High Income

Low income-up to Rs. 15,000, Middle income-Rs. 15000 to 40000

High income-Rs. 40000 and above

The above table infers that 40 percent of sample households is higher belongs to very low level income group follows that 26 percent of higher level income group and 18 percent is the least , it belongs to Rs. 15,000 to Rs.40,000 income group. This shows that the major people of the study town belongs only on the lower and higher of income groups. It explains the income of people of low and high level groups. 18 percent of income groups is the least belongs to Rs. 15000-Rs.40000. Hence in our study most of the people belongs to low level of income group respondents. Low level income groups had no purchasing power of buying water. . Low level groups were taken the water from hand pump provided by our government. It comes only one hour in the morning and one hour in the evening. It is very difficult to consume all the times by low level people. They have not big storage tanks at all. So they were lived in very difficult situation. But High level income groups have more number of storage tanks and they consumed more number of water. It is the main thing to distribute the water in equal for all the groups. Middle level income groups, most of the people were lived in the residential area. However they managed within their income.

UTILIZATION OF WATER IN SAMPLE HOUSEHOLDS (litre per day)

Location / Income	Drinking	Cooking	Bathing	Toileting	Other purpose	Total	Per capita
Slum	6.5	23.5	43.5	16	17	106.5	44
L	7	22	42	17	16	104	43
M	6	25	45	15	18	109	45
CBT	8	33	52	24.3	23.3	140.7	58.7
L	8	30	48	24	22	132	55
M	9	35	52	27	25	148	62
H	7	34	56	22	23	142	59
Residential	8	30.5	54.5	19	22	134	55.5
M	7	29	52	18	20	126	52
H	9	32	57	20	24	142	59
Overall	8.7	34.0	58.0	25.0	24.0	149.6	62.4
L	7.6	28.3	36.0	22.6	19.6	126.3	52.6
M	7.7	30.0	52.0	21.2	21.25	132.2	55.0
H	8.3	33.3	56.0	24.0	24.0	146.0	61.0

Source: Computed from primary data

The total water consumed per household increases from 104 liters to 126 liters per day, as the income increases. It is also astonishing to note that the per capita utilization of water is relatively higher in the CBT areas at 59 liters, the residential area at 56 liters, and it is the least for slum area at 44 liters. The utilization of water per capita is the highest one in CBT areas due to workers and private groups. Moreover, the per capita utilization of water is least for the slum area, it is mainly attributed to most of the slum households which depend on the public hand pump as well as the public pipe water facility provided in the street. The piped water from the public sources is provided only on certain timings, i.e., a few of hours in the morning time and few hours in the evening time. The slum dwellers are taking advantage by utilizing the piped water by filling water through pots and containers by using their family members. Therefore, the per capita availability as well as utilization of water is the least. Further, the results indicate that as the income increases, the utilization of water and per capita utilization of water is increases. The per capita utilization of water differ according to different locations as well. This variation is mainly due to the variations in the use of water for cooking, bathing, toileting and other purposes like gardening or cleaning the house and consumerable durables.

LOCATION-WISE AND INCOME-WISE WATER RESOURCE USE (per capita)

Location / Income	Water (liter per day)
Slum	72
L	20
M	52
CBT	143
L	27
M	56
H	60
Residential	90
M	38
H	52
Overall	305
L	47
M	146
H	112

Source: Computed from primary data

The location and income wise intensity of Water resource use are measured in terms of, water. Environmental resource use of water per day in terms of liters is the highest in the case of CBT areas at 143 liters per day, followed by Residential areas and it is the least in the case of slum areas to the extent of 72 liters per day. The maximum use of water in the case of CBT areas is explained by most of the affluent service groups residing either in government quarters or readily built houses, where the main source of water facility is provided by government Municipal Corporation for cooking, bathing, drinking and so on. On the contrary, the environmental resource use of water is low for the slum areas, where many households depend on bore well, common well, handpumps and pipe

connections provided for households in the common places of a street. Therefore, the households take a maximum advantage of water consumption in a common place, where the fetching water from the common pipe is crowded. That is why, the water usage per day for the slum household is the least.

SOURCE WISE USE OF WATER FOR DRINKING AND COOKING

(in litres)

Location / Income	Piped water	Treated water	Bottled water	Total
Slum	15	10	5	30
L	10	5	3	18
M	5	5	2	12
CBD	10	10	10	30
L	8	1	1	10
M	1	8	4	13
H	1	1	5	7
Residential	7	13	10	30
M	4	2	4	10
H	3	11	6	20
Overall	32	33	25	90
L	18	6	4	28
M	10	15	10	35
H	4	12	11	27

Source: Computed from primary data

The results shown in above table explain the source wise use of water for drinking and cooking according to income and location wise. Out of 90 sample households, 33 sample households adopt treated water, followed by 32 sample households which adopt piped water and 25 sample households which adopt bottled water. From the results, one could infer that a maximum number of sample households are taking advantage from the private pump, which is hard in nature and it is treated for drinking and cooking purposes. It is also interesting to note that the treated water facility and bottled water are maximum taken advantage only in CBT areas, and residential areas. At the same time, the piped water is taken advantage of by most of the slum dwellers. From this result, one could infer that the hygienic method of water usage is adopted by the elite groups as well as the higher income groups, whose houses are mostly located in the residential extension areas CBT. Another interesting observation is that the usage of hygienic water increases through treated or bottled water as the income increases or vice versa. It is because of high income added with higher education, they know the importance of pre-cautionary methods to avoid pollution which causes diseases, either through water, air, noise, etc

INCIDENCE OF DISEASES AND HEALTH EXPENDITURE OF SAMPLE HOUSEHOLDS IN CHIDAMBARAM TOWN

Location	Children		Adults	
Slum	46.6	53	40.6	81
L	46.3	52	40.3	79
M	46.9	53	40.9	83
CBD	35.9	193	30.5	215
L	35.4	191	30.2	211
M	36.9	193	30.9	219
H	35.3	195	30.5	215
Residential	27.5	105	24.7	273
M	28	104	24.0	272
H	27	106	25.4	274
Overall	40.1	109.2	33.4	183
L	41.2	108	32.5	182
M	40.6	109.5	34.6	183
H	38.5	110.2	33.2	185

Source: Computed from primary data

The results on incidence of diseases and health expenditure of sample households in terms of children and adults are exhibited in the above table. The result indicates that about 41.2 percent of children are affected by diseases from the slum area. It implies that the households are affected by effluent pollution of diseases caused by the slum area due to concentration of bad drainage system. In all the locations and income groups, the percentage affected by diseases for children are more than adults. In case of adults, the highest 40.9 percent in the slum areas, and the lowest 24.0 percent in the residential areas are affected. The average health expense for children is from Rs.52 to Rs. 106 and for adults from Rs. 79 to Rs. 274. The average health expense of the household per month is higher for adults than for children in all the locations.

8. POLICY SUGGESTIONS

The following suggestions will be helpful to the policy makers, administrators and academicians for effective Water management and sustainable livelihood development of the urban households:

The resources raised are spent for their welfare with maximum economy and efficiency. The municipality must take steps to stabilize the revenues through lease and also avoid domination by single individuals in taking lease of municipal properties. The municipal fund could be properly utilized by avoiding waste through proper planning and improved method of budgeting, accounting and audit with the techniques of material management.

The government must chalk out plans and pass comprehensive legislations to curb water pollution. It must take steps for the proper implementation of laws. Then the town households got pure drinking water.

In Chidambaram town, response to this level of expenditure and low level of service, the main argument raised for private sector might be more efficient than the public sector in providing services. Private sector efficiency is said to derive from management flexibility, freedom of action, greater financial discipline, and accountability to market forces.

Curative measures are to be carried out by better water use planning, urban re-development programmes and installing , monitoring and surveillance systems. The primitive measures are introduction of fines, levies, taxes, demolition and imprisonment.

Urban health education and environment quality can play a much more expanded and initial role in bringing about changes in health practices and in the knowledge and attitude related to such changes in the field of occupational health and thus can contribute its share in the promotion and maintenance of highest degree of physical, manual and social well-being of workers in all occupations in the city.

The prevailing diseases and water management, prevailing measures and better hygienic conditions could be propagated through documentary films in a few selected areas in each ward to create awareness among the urban dwellers.

Measures to abate water problem can be classified as short-run and long-run. Short run measures consist of government direct control measures like tax assistance, subsidies, regulation by standards, and regulations by water charges. Long-run solutions are those which directly and indirectly abate charges:

1. Recycling waste water.
2. Create the awareness to the people
3. Government should insist rain water harvesting to the urban dwellers.
4. Every individual should take care of the water as their children.
5. A holistic approach involving medical practitioners, scientists, and social workers will need to work coherently to find out a solution that can lessen sufferings of the humanity and making provision for safe drinking water.

9. CONCLUSION

I conclude that, Utilization of water by the sample households in the Chidambaram Town, CBT areas of households is relatively higher compare to other locations. We should create every individual to save and minimize the

consumption of water, then the other locations of sample households benefitted. If the sample households would properly utilized the water then the sample households definitely managed the water within their income. Government should take care of the slum area of the households to provide the water continuously. Every individual should take care of the water as their children. Then only our future generation avail all these natural resources like water.

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