THE ECONOMIC IMPACT OF SAFE DRINKING WATER SUPPLY IN TIRUCHENDUR TALUK OF THOOTHUKUDI DISTRICT IN TAMILNADU

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ABSTRACT

This paper tries to investigate the economic impact of safe drinking water supply in Tiruchendur taluk of Thoothukudi district in Tamilnadu during 2014-2015 in respect of selected economic indicators. The impact of safe drinking water was found high in the variables namely approach to self-employment, crisis identification, pull and push factors and risk-taking enthusiasm. We hope that the study would help policy makers and others to formulate appropriate plans to supply safe drinking water.

Keywords: Drinking water, Ecosystem, Urbanisation, Public health

1. INTRODUCTION

To provide every rural person with adequate safe water for drinking, cooking and, other domestic basic needs on a sustainable basis. This basic requirement should meet minimum water quality standards and be readily and conveniently accessible at all times and in all situations. Water is an essential, life giving force, its scarcity demands our attention. Even with the coordinated efforts of all nations, future water scarcity may result in a health and financial crisis of unparalleled magnitude.

Water related diseases, most commonly attributed to water scarcity, have taken more children's lives in the last ten years than the combined deaths of those lost in armed combat worldwide over the last sixty years. Yet water conservation policies rarely extend beyond reducing the frequency of watering lawns or washing cars. Current access to an abundance of water has permitted the western world to turn a deaf ear to the impending crisis. An examination of water consumption data over the past century illuminates a clear trend of abuse. In the last four decades, worldwide

water use has doubled to more than 1,700 liters per person per day. Water consumption essentially grows by a factor of two every twenty years.

This rate is twice that of global population increases, suggesting that more increase in population is not a sufficient explanation for the problem. Expansion of western and modernizing influences are at the root of this discrepancy between consumption and population growth while societal advances such as greater accessibility to indoor plumbing are partially to blame, the growing industrial demands for water put the most pressure on water resources.

Water is a state subject, and the schemes for providing drinking water facilities are implemented by the states. In addition, the 73rd Constitutional Amendment, which provided for the constitution of Panchayats at the District, intermediate, and village levels, also provides in the Eleventh Schedule of the Constitution that Drinking Water and Sanitation are matters that could be devolved to the Panchayats through State legislations. Under the provisions of Article 243G of the constitution, most states have devolved powers and responsibilities in respect of Drinking Water and Sanitation to the Panchayats.

Traditionally water supply in India was limited to major towns and cities and that too were within the boundaries of state/provincial units. With the spread of the process of urbanization and declining public health standards in both urban and rural India, post-independent India took a serious initiative in the form of laws and policies.

A two-way approach has been adopted by India, in this regard, viz:

- Legislation focusing on water supply and at times on water supply and sanitation, to be driven by the state agencies.
- Policy initiatives by the central government in order to assist and supplement the states activities with the overall objective of providing safe drinking water and thereby promoting public health.

As far as the institutional structure for rural drinking water supply is concerned, the Ministry of Rural Development, Department of Drinking Water Supply, is responsible for planning, policy formulation, direction, financing, monitoring and reviewing the implementation and progress at the central level.

The Ministry had set up the National Drinking Water Mission Authority with the Prime Minister as Chairman and an Empowered Committee headed by the Cabinet Secretary to review the progress of implementation of the programme. At the State level, the Public Health Engineering Departments, Panchayat Raj Departments, Water Boards, etc. are executing the Programme.

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1.1. Issues

Access to safe drinking water is a fundamental prerogative of all citizens of the country. But it remains a distant dream of the bulk of the population. India is heading towards a fresh water crisis mainly due to improper management of water resources and environmental degradation which has led to lack of access to safe water supply to millions of people.

There has been lack of adequate attention to water conservation, efficiency in water use, water reuse, and ground water recharge and ecosystem sustainability. An uncontrolled use of bore well technology has led to the extraction of groundwater at such a high rate that often recharge is not sufficient. The causes of low water availability in many regions are also directly linked to the reducing cover and soil degradation. Pollution of groundwater resources has become a major problem today. The pollution of air, land and water has no effect on the pollution and contamination of groundwater.

India's rapidly raising population and changing life style has also increased the domestic need for water. But, now-a-days drinking water is being sold in plastic containers and plastic pouches. Thus supply of drinking water has become a business. Today we pay for the drinking water. Therefore in this paper has been made an attempt to analyze the safe drinking water supply in Tiruchendur Taluk of Thoothukudi district in Tamil Nadu

1.2. Literature review

A survey of available literature reveals the fact that studies undertaken in the area of drinking water facilities have been undertaken in recent years.

Balasubramaniyam et al. (2009) examined whether different social divisions help to explain the variation in tap water access across India. Using data for 436 rural districts from the 2001 Census of India, it finds that communities that are heterogeneous in terms of Hindu castes have less access to tap water than correspondingly homogeneous communities. By contrast, religiously fragmented communities have more access to tap water than correspondingly homogeneous communities. Therefore, heterogeneity within and across religions may work in opposite directions for access to public goods. So, this study suggests that the social fragmentation should be considered in framing policies and argues in favor of differential policies for better water management.

Katsha and White (2009), made an attempt to understand the behavioral patterns of women in rural households regarding water and sanitation. For the study an interdisciplinary team surveyed 312 households in two Egyptian delta villages, examining 46 of them in depth, through participant observation method. Main observations of the study are: their patterns of storing

water, and its use for drinking, cooking, washing, animal rearing and waste disposal are rooted in the woman's beliefs regarding cleanliness and what enhances the health and well-being of her family. The local environment of surface and groundwater availability, quality and available drainage affect her choices. Other factors include local government institutions, available technology, information and educational facilities, time and energy expended on various practices, and social values held by women and the community.

Aijaz (2010) made some general observations on the status of urban water supply. This case study states that the demand for basic infrastructure and services in Indian cities has increased phenomenally due to rapidly growing populations. Such unmet demands often adversely affect the quality of urban life, the economic productivity, as well as the process of sustainable development. On the basis of case studies for three large cities of India, namely Delhi, Mumbai and Kolkata, Aijaz (2010) argued that there exists an immediate need to build up the eater infrastructure and institutions, and he pointed out that the challenge for stakeholders lies in speeding up the reform process and in the replication/implementation of efficient water governance practices.

Jigar and Lalani (2011) observed the status of urban water supply and compared it with rural supply. The water supply in most Indian cities is only available for a few hours per day, pressure is irregular, and the water is of questionable quality. No major Indian city has a 24 hours supply of water, with 4 to 5 hours of supply per day being the norm. This is very low when compared to the Asian-Pacific average of 19 hours per day supply. These averages conceal a great deal of heterogeneity within cities. Eighty-eight per cent households have access to an improved source of drinking water, with greater access in urban areas. The most common improved source of drinking water for urban dwellers is piped water; 71 per cent either have water piped into their living area or use a public tap. By contrast, only 28 per cent of households in rural areas have access to piped water. Most people (53 per cent) in rural areas obtain their drinking water from a tube well or bore well. Consumers without 24 hours supply tend to use more water than those with continuous supply because consumers store water, put it away to replace with fresh supplies each day. Intermittent water supply, insufficient pressure and unpredictable service impose both financial and health costs on Indian households. Many households with house service connections were found to have undertaken long-term investments in the form of water tanks, hand pumps or tube wells. Households with water tanks install booster pumps on the main water line itself and pump water directly to water tanks. This increases the risks of contamination of the general water supply and reduces the pressure in the network for other user, leading them also to install motors on the main line.

According to government publication 94 per cent of the rural population of 74% million (2001 census) has access to safe drinking water through 4 million hand-pumps and 0.2 million piped water schemes. At the same time, waterborne disease affects 37.7 million Indians annually, 1.5 million children are estimated to die of diarrhea alone and 73 million working days are lost due to waterborne diseases each year. The estimated annual economic burden is about $600 million of year, which is more than the annual expenditure ($460 million) of the sector. In the case of urban population, the coverage is about 91 per cent. It is estimated that India needs to invest $6.700 million in urban drinking water and sanitation alone by 2015 in order to meet its MDG target.

According to WHO 1.1 billion people, or 18% of the World Population lack access to safe drinking water more than 2.2 million people in developing countries, most of the children die each year from diseases associated with lack of access to safe drinking water in adequate sanitation and poor hygiene. A Child died on an average of every 15 seconds because of lack of access to Safe Drinking Water inadequate sanitation 88% of diarrheal disease is attributed to unsafe water supply and inadequate sanitation and hygiene. Water related diseases are a human tragedy, killing up to 5 million people annually, preventing millions of people from leading healthy lives, undermining development efforts.

Bowonder (2012), examined the inter connection between water resources management and quality of it in the developing countries, particularly in India. Serious problem areas in India are identified, such as water logging, urban sewage disposal, and recurrence of malaria and silting-up of reservoirs. Many of these problems occur due to lack of administrative coordination and fragmentation of large interactive systems into functional areas. By using systems theory a number of action imperatives are identified. Improvement in linkages, better coordination of interactive functions, and stimulation of multiple uses of water, improved water management practices and education aimed at water conservation are the important actions to be initiated.

The NSSO Report (2012) has revealed that the percentage at households using tap water in the urban areas is 70% considerably higher than the figure at 18.7 for rural areas. The National family Health survey II (1998 – 99) found that 39 per cent at households in India use piped water, comprising of 25 per cent in rural areas and 74.5 per cent in urban areas. As per census of India, 2001 the coverage of households, having access to safe drinking water was 77.9 per cent, comprising 90per cent of urban household, and around 73 per cent of rural households.

1.3. Objectives and chapter design

The main objectives of this paper are;

- To examine the economic impact safe drinking water in Tiruchendur Taluk in connection with domestic water supply
- To suggest suitable policy measures to abolish water scarcity in Tiruchendur Taluk

This paper has four sections; the first section reveals that introduction with issues, literature reviews and objectives. The second section deals with database and methodology. The third section deals with results and discussions and final section deals with suggestions and conclusion.

2. DATABASE AND METHODOLOGY

This paper concentrates on drinking water problems in respect of water supply and government activities to reduce water scarcity in Tiruchendur Taluk of Thoothukudi district. The paper taluk covers 21 wards with a population of 32,171. Since the number of households has been increasing year by year providing safe drinking water is the urgent responsibility of the state and local government. The Tiruchendur Taluk's water need is being fulfilled by 3 major water schemes implemented by the local government. The scheme one Kanam water project, extract its water resources from the village Kanam which is situated within 7km of the study Taluk. The second water project Ellappanayakkan kulam is situated around 3km from the study area. The third scheme ponnankurichi water is situated in ponnankurichi village 4km the study Taluk. These Three schemes are the main sources of drinking water supply projects in the study Taluk. This paper attempts to examine economic impact of safe drinking water supply through simple statistical techniques like mean and 't' test etc.

2.1. Sources of data

The study entirely based on the primary data collected through questionnaire and interviewed the households to get information regarding drinking water related issues. The sample size of the study takes into account three water projects, which supply water to the households of the Tiruchendur Taluk. The primary data collected from the respondents by takes into account the general characteristics of the domestic Drinking water users such as age, sex, education, occupation, family size, religion, community, family income etc. The information regarding the level of satisfaction of the respondents in water supply, period of water supply, time spend to fetch water, type of water storage facilities, impact of safe drinking water, willingness to pay for including drinking water services etc have been collected. This study covers the period of 2014-2015.

3. RESULTS AND DISCUSSION

Most satisfaction measurements methods presently used by water utilities compare people's satisfaction with past performance. It is now widely accepted that for many people, access to clean and safe water in sufficient quantities is the most serious challenge of survival in the twenty-first century. The primary expectation that consumers have of their supplier is that they provide safe drinking water

3.1. Economic impact of Safe drinking water

Safe drinking water is a basic need for human development health and well-being and hence drinking water accepted human right. In India, only 84% of the population has access to safe drinking water. It is estimated that approximately one-third of the world's population uses groundwater for drinking purposes and today more than half the world's population depends on groundwater for survival. Groundwater resource is under threat from pollution either from human lifestyle manifested by the low level of hygiene practiced in the developing nations.

With increasing industrialization, urbanization, and growth of population, India's environment has become fragile and has been causing concern. To be effective, drinking water educational programs need to have a basis in actual public perception and needs. Chandrasekhar Hariharan (2008) carried out a survey on attitude to water conservation, observed that rather than expecting restraints from water users, it was important that urban planners devise and implement measures to enhance water reuse. Pollution of water is due to increased human population, industrialization, use of fertilizers in agriculture and manmade activity. The sewage treatment facilities are inadequate in most cities and almost absent in rural India. Foster and Beattie while analyzing the urban residential demand for water in the United States pointed out that the estimation of urban water demand has progressed from a requirement concept to economic development models. This section deals with the impact of safe drinking water in the selected area.

The impact of safe drinking water are measured through ten selective variables such as generation of water literacy, to promote water conservation measures, willingness to pay, community participation, rainwater harvesting, pattern of water use, efficient management, reduction in unaccounted water, affordability to pay and personal hygiene and health. Each of the ten variables is measured with the help of responses to relevant questions in respect to each construct by using a five point scaling technique according to their level of knowledge namely strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree' which carries 5, 4, 3, 2, and 1 marks respectively.

In order to examine the differences in mean score values of each variable of the impact of safe drinking water on the sample respondents, the computed mean score values and t-values are presented in Table.1.

According to Table 1. in Tiruchendur municipality, the impact of safe drinking water was found low in the variables namely information searching performance, choice creation capability and administrative skill. The mean score values of these variables are 2.9919, 2.9333 and 3.0417 respectively. The impact of safe drinking water was found high in the variables namely approach to self-employment, crisis identification, pull and push factors and risk-taking enthusiasm.

The mean score values of these variables are 3.2833, 3.2083, 3.1833 and 3.1750 respectively. The significant difference among the safe drinking water is found high in all aspects of safe drinking water except choice creation capability, risk taking enthusiasm and economic inspiration since its respective 't' statistic is not significant at 5 per cent level.

Table 1: Impact of safe drinking water

S. No.	Safe drinking water Variables	Mean	T-test
1.	Generation of water literacy	3.8024	2.5143*
2.	To promote water conservation measures	3.1867	2.6281*
3.	Willingness to pay	2.7501	2.3072*
4.	Community participation	2.6643	1.1901
5.	Rain water harvesting	2.7314	1.1051
6.	Pattern of water use	3.8134	2.5843*
7.	Efficient management	3.0645	2.4927*
8.	Reduction in unaccounted water	2.1834	1.1055
9.	Affordability to pay	3.6482	2.1018*
10.	Personal hygiene and health	3.0437	2.4213*
11.	Sewage Treatment Facilities	2.3419	1.4372
12.	Per capita consumption of water	2.5647	1.4681
13.	Quality of Water from Municipal Taps	3.4862	2.5486

Source: Computed Data.

* Significant at 5 per cent level.

4. SUGGESSIONS AND CONCLUSION

The major suggestions may improve the safe drinking water supply as following;

- ✓ Depending on the growth of population new water schemes should be implemented.
- ✓ The local government should assure the safe drinking water supply once in two days
- ✓ The prices of packaged drinking water must be regulated
- ✓ More founds should be allocated for panchayat water schemes
- ✓ The government should create awareness about water bone diseases through local health workers.
- ✓ Water conservation method should be adopted by both individual level and of community level
- ✓ The government should concentrate alternative drinking water source such as desalination project, water regulatory devices etc.
- ✓ Water exploitation by multinational corporations should be regulated

4.1 Conclusion

Improvement is a continuous process providing access to safe drinking water to all citizens of the country is more easily said than done. Unless a good health is assured to every citizen the progress of the nation will be hampered. If even a single citizen is denied safe drinking water, he or she is denied of good health. This is the very negation of the fundamental rights of a citizen enshrined in the constitution of our country. We are now engaged in the process of implementing the basic necessities to the majority of the people. Access to safe drinking water is one such priority. Considering the Number of villages, provision of drinking water for all is an arduous task. Therefore, governmental efforts should be supplemented with those of the private sector, corporate sector, NRIs, NGOs etc. The levy of user charges is justified as it would raise community responsibility and promote water.

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