



## **Demand for Safe drinking water in regional development perspectives of a developing country: A review of literature**

**Dr. DP Withanage**

Senior Lecturer, Department of Economics, University of Sri Jayewardenepura, Sri Lanka

### **Abstract**

The aim of this literature review research was to reveal evidence that helps understand the importance of the availability of safe drinking water in regional development of a country. The findings of the study are important when taking policy decision in regional development in all developing countries including Sri Lanka. First, the study revealed that availability of safe drinking water is a vital requirement for the development of a region. Second, it revealed that there is a growing demand for safe drinking water with the development of a region. If the government disregards this growing need of safe drinking water, the regional development would not be possible. When considering health matters, tourism, etc. which are important in regional development, availability of safe water is a pre-requisite. However, environmental problems that can be arisen when producing water and that can happen when consuming bottled water should be arrested with necessary action by the interference of government. If it takes a long time to give a solution for safe drinking water, the government should take steps to provide safe water until that sound solution is found.

**Keywords:** safe drinking water, bottled water, regional development, demand for drinking water, water consumption

### **1. Introduction**

The demand theory and the consumer behavior are the foundation of market analysis, where all the market models are based on. The literature that has been accumulated regarding the demand and the demand for different goods and services is very large. When considering the drinking water, it became a commodity or good available in the market in the recent past and before that it remained mostly as a natural good. As such, it is not like the situation of other goods and services, the literature on the demand for water that remains within the very large literature of demand for goods is not much extensive. Particularly, available studies on the demand for water is not sufficient to understand the different forms of problems that can exist in the case of the demand for drinking water in Sri Lanka. However, since this is a growing industry at present in Sri Lanka, it should be given a special attention on the behavior of the drinking water market. This is a literature review study on the demand for drinking water and it unveils the empirical evidence about the demand for drinking water market in developing countries. The aim of the study is to reveal evidence that help understand the availability of safe drinking water everywhere in a country for a comparable development of all regions. Drinking water, being one of the basic needs of humans, is essential for living and without safe drinking water people who have a concern on good health would not be able to migrate to such regions. In other words, availability of safe drinking water in water scarce regions would make a positive influence on regional development. In Sri Lanka also there are some regions that have a scarcity of drinking water or that have a doubt about whether the available water is safe for drinking when considering the health of people. However, if safe drinking water is available in such areas there would not be any psychological problem for the people to live in such areas, engage in economic activities same as in other regions of

the country at least actions are taken to eliminate that threat about the water.

### **2. Review of empirical evidence and views**

A region refers an area, district, province or a wider area that covers a number of small areas. The areas or regions that the people live in a country are not equal in development as well as in the availability of safe drinking water. Researchers have investigated only to a limited extent on this special field of study and available findings can be summarized as follows.

The Government Office for Science (2011) points out that that migration happens in a way that taking people away from areas where they will be vulnerable to global environmental change. If this is widely practical, the areas where safe drinking water becomes not available will have a tendency of being deserted. Since there is growing demand for safe drinking water, it has become a decisive factor of migration. This means that areas where safe drinking water is not available would have a risk of not attracting people for living and therefore would not be developed. Foote (2011) <sup>[6]</sup> examined the individual perspectives on bottled and tap water in order to understand how preferences for bottled water emerge within immediate, everyday contexts. He found that a larger proportion of residents of the lower-income neighborhood were more likely to have bottled water, suggesting that the demand for bottled water is relatively inelastic. This reflects that if the bottled drinking water is not available in an area, it would not be able to develop that area due to the reason that low-income laborers would not migrate to that area for the necessary labor needs. However, there are some studies that show that people dislike bottled water. Studies done by Fife-Shaw *et al.* (2007) and Hu *et al.* (2011) show that older adults were less likely to pay for water. It means that the relationship with age of consumers and demand for drinking water is

negative. Furthermore, they reveals that a higher proportion of the men in this study had chosen to avoid bottled water consumption. However, this is a thing that one can expect from older generations since they have not had such a consumption culture in their life time earlier. Some studies have revealed that more educated people (basic degree and above) tended to be less frequent consumers of bottled water. There are evidence to prove that people mostly use bottled water as a means of convenience. Foote (2011) <sup>[6]</sup> reveals that health, safety and taste were all properties considered regularly amongst bottled water consumers, but secondary to the convenience that bottled water provides. In that sense, if the bottled water is necessary as a convenient means of consumption, especially, bottled water help develop tourism which leads to the development the tourist areas. However, the most common reasons for being put off by bottled water are its high cost. In Ward *et al* (2009) study about perceptions on the health of bottled water, they had found that convenience and cost played major roles in the decision making process. Despite the wide range of opinions in favor of bottled water over tap water, a majority of bottled water drinkers buy bottled water based on price thus preferring to buy store brands, rather than brands more likely to have undergone filtration beyond that provided by tap water or advertised as obtained from a natural source. Nketiah Amponsah *et al.* (2009) <sup>[14]</sup> also reveals important finding on drinking water sources in Ghana. They highlighted the sources of drinking water in Ghana and concluded that access to piped water is an urban phenomenon and driven by supply rather than demand. Hence, rural dwellers mainly rely on other alternatives such as boreholes and protected wells. They show that the predominance of piped water in urban areas is an indication of the generally low level of infrastructure in rural areas. Development of rural areas are critically dependent on the availability of water sufficiently. Furthermore, they found that income is a significant determinant of the use of piped water in residence. The households with access to clean toilet facility and high level of education would not use unprotected water for drinking purposes. These researchers direct attention on the important of rural infrastructure in regional development. Fotue (2012) <sup>[7]</sup>, by his study in Cameroon, reveals that water is identified as one of the most important natural resources because it is viewed as a key to prosperity and wealth. He points out that access to and use of safe drinking water can make a massive contribution to health, productivity, and social development. He reveals that, distance is statistically significant and inversely related to the source of drinking water. Thus, there is an inverse relationship between distance to a particular source of drinking water and the demand for the drinking water from that source. Fotue also suggests that female-headed households are more likely to adopt private tap or collective tap as the main water source, compared with male-headed households. Moreover, he reveals that the household's size has a significant positive effect on household's choice of private tap and negative impact on household's choice of coping sources. The study also suggests that households' characteristics such as residence area and education have an impact on the choice of drinking water source. Furthermore, he mentions that the demand for safe drinking water increases with the development of underdeveloped remote areas.

Wendimu and Bekele (2011) reveal the determinants of individual willingness to pay for quality water supply through a case study conducted in Ethiopia. The result shows that income, household size, age of the respondent, education level of the respondent, reliability of the existing water supply, respondent perception on the quality of the existing water source, etc. are important variables of the demand for improved water. Nketiah-Amponsah *et al* (2009) <sup>[14]</sup> reveal, with the evidence from Ghana, that income is a significant determinant of the use of piped water in residence. This means that with the increase of the household income of the people of rural areas, the demand for safe drinking water would have a tendency to expand. Motiram and Osberg (1999) carried out a survey in India in order to find out the determinants of access to drinking water in urban and rural areas. They found that professional status landline quality and dependency ratio were important among the determinants of access to water in the rural sector. Meanwhile professional status, laborer status, wealth status, dependency ratio and social capital were important in the case of the urban sector. In regional development point of view, this shows a difference between rural and urban in terms of the determinants to access for drinking water. Foote (2011) <sup>[6]</sup> points out that two of the most important reasons for people switching to bottled water are the health and safety. Edokpayi *et al* also mention that consumption of microbial-contaminated water can cause in diarrheal illnesses and enteropathy with the heaviest impact on children under the age of five. In that point of view, in the areas where there is a more possibility of such health problems, consumers of drinking water will pay more attention to purchase safe water especially for their children. The demand for water will be expanded in such regions. Bottled water began as a medicinal product and since it was bottled from springs, it was thought that it has a power for the purpose of curing some health problems. As such, there was an especial demand for bottled water at the beginning. According to Parag and Roberts (2009: 627), bottled water was popularized due to the undermining in the public trust in tap-water providers and developing policy and other means to rebuild that trust. When this considered in regional point of view, unavailability of safe drinking water in some areas of a country can be a main reason to create a special demand for bottled water or others forms of safe drinking water. However, the environmental impact of bottled water consumption has been critically discussed and it generates more adverse effects than the consumption of tap water. This is due to the extraction of oil and other materials for the processing of containers and plastics. Rodwan (2009) states that "consumer concerns about the environment may affect the buying decisions of the consumers. Arnold and Larsen (2006) are also in the view that because the bottles are made from polyethylene terephthalate which comes from crude oil, this is harmful for the environment. However, when considering the short term benefits of consumers, it seems that they will keep a higher weight on the health concern of drinking water. Finally, it shows that when considering the finding and ideas of the researchers and water experts, the demand for water can be created due to many reasons. These finding can be matched with the regional development concept and thus it can understand why there is a special demand for bottled and other forms of safe drinking water compared to other

regions.

### 3. Discussion

It seems that studies mainly focused on the safe drinking water and regional development are rare in the literature. However, it is possible to draw points from the available literature and accordingly, the importance of safe drinking water can be viewed and matched with the regional development concept and practices mainly based on the following two main points:

First, it seems that the availability of safe drinking water becomes a main factors of development of a region of a country. If the safe drinking water is not available people would not live in such areas and it adversely affect the development of that region. Furthermore, if the safe drinking water is not available, tourism will not develop in the area and therefore the benefits of tourism would be impossible. Furthermore, many other economic activities would not be activated due to this reason and the well to do people will transfer to other areas from that region.

Second, if there is a development of a region of a country, in income of the people of that area would also be increased. Consequently, with the rising income level, the people will pay more attention for safe drinking water and the demand for bottle water and other forms of drinking water will be increased. Especially, the population of the growing regions increases and that also becomes a reason to increase the demand for safe water.

Largely, the increase of pure drinking water due the two main reasons mentioned above can be again be matched with the facts revealed in the literature review. One of such reasons is the health concern of the consumers and they tend to demand safe water since they are careful about the health. For example the demand for safe water is very high in the dry zone areas of Sri Lanka because that the people think that the kidney problem, which is a serious health issue of the country at present, arises from the water of that region of the country. Another reason is that the parents pay more attention about the health of their children and therefore they demand for safe drinking water. Furthermore, in the regions where more tourist places are available, the demand for safe drinking water is high. In the case of Sri Lanka, it can be expected to have big demand for bottled water in Anuradhapura, Polonnaruwa, Katharagama, Coastal tourist places and other tourist areas where local and foreign tourists' arrivals are high.

The study show the importance of another regional dimension when considering the demand for safe water. It shows that the demand for safe drinking water increases with the urbanization of a country. As such, it is possible to expect a higher demand for safe water in urban regions compared to rural regions of a country.

Location of industries and public and private enterprises can be important sources of demand for safe drinking water. As such, location of such organizations in one hand, leads to regional development while increasing the demand for safe water. In addition, the literature revealed that the doubt of consumers about the available tap water is a reason to create a demand for bottle water. People think that water provided by public sources are not safe in developing countries even though the confidence over the tap water is high in developed countries. However, the literature reveals that there is an environmental issue with regard to the bottled water since it creates more plastic, and the bottles are used

indecently, offensively and harmfully for the environment. Especially, throwing of plastic bottles everywhere in tourist places of Sri Lanka has become huge problem in the point of view of environment protection and sustainable development. In spite of this argument there evidence shows that the demand for bottled water increases.

### 4. Conclusion

The review of literature on the demand for safe drinking water in regional development help draw important conclusions.

First, it shoes that availability of safe drinking water is one major factor that determine the regional development. As such, if there is a problem of the available water in a particular area and if a long period of time is necessary for a permanent solution for that problem, until that solution is given a good role is to be played by the provision of bottle water and it helps develop confidence of the water consumers.

Second, it seems in some areas, tourism is the only possible way of development. As such, provision of bottles water is especially necessary for such areas. However, the government should intervene to control the necessary quality standard of drinking water interfering to the water market.

Third, since the sustainability concept is important in regional development as well, it is important to protect the environment from the possible damage from the production and use of bottles especially in water production areas and tourist place. Fourth, the demand for safe drinking water increases with the urbanization of a country. As such, it is possible to expect a higher demand for safe water in urban regions compared to rural regions of a country.

Finally, safe drinking water, being one of the main determinants of the good health of people of any country, should be given priority in make it available in every region where people are inhabitant or travel temporarily and it is necessary for the regional development. For this purpose, government should intervene with both short-term and long term steps.

### References

1. Ahmad I, *et al.*. Factors Determining Public Demand for Safe Drinking Water (A Case Study of District Peshawar). PIDE Working Papers. Pakistan Institute of Development, Islamabad, 2010, 58. Retrieval from [http://www.pide.org.pk/pdf/working%20paper /workin gpaper-58.pdf](http://www.pide.org.pk/pdf/working%20paper%20paper-58.pdf) .
2. Aguirre MS. The value of water and theories of Economic growth. Water Crisis: In P.P. Rogers, M.R. Llamas and L. Martinez-Cortina (Eds.), Myth or Reality, 2006, 93-104.
3. Bibi T, *et al.* Estimation of Demand for Bottled Water in Peshawar-Pakistan. Euro-Asian Journal of Economics and Finance. 2014; 2(3):216-223.
4. Edokpayi J, *et al.* Challenges to Sustainable Safe Drinking Water: A Case Study of Water Quality and Use across Seasons in Rural Communities in Limpopo Province, South Africa. Water. 2019; 10:159. doi:10.3390/w10020159
5. Ferrier C. Understanding a Social Phenomenon. Discussion Paper, 2001, Retrieval from <http://www.assets.panda.org/downloads/bottledwater.pdf>.

6. Foote ML. Examining Reasons for Bottled Water Consumption: A Case Study in Pensacola, Florida (Master's thesis, University of South Florida, Florida, USA), 2011. Retrievable from <http://www.usf.edu/cgi/viewcontent.cgi?article+4301&context+etd>.
7. Fotue LAT. Awareness and the Demand for Improved Drinking Water Source in Cameroon. *International journal of Economic Practices and Theories*. 2013; 3(1):50-59.
8. Jordan JL. An Introduction to water: Economic Concepts, water supply and water use in USA. Faculty series, 2018; 98-12. Retrievable from <http://www.ageconsearch.umn.edu/bitstream/16659/1/fs9813.pdf>
9. Lanz B, Provins A. Estimating the Demand for Tap Water Quality: Avertive Expenditures on Substitutes for Hardness and Aesthetic Quality. Research Paper 23. Graduate Institute/ Centre for International Environmental Studies, Geneva, 2014.
10. Linden Svander. Exploring Beliefs about Bottled Water and Intentions to Reduce Consumption: The Dual-Effect of Social Norm Activation and Persuasive Information. *Environment and Behavior*. 2014; 47(5):526-550. DOI: 10.1177/0013916513515239.
11. Manemann WM. Economic Conception of Water. Water Crisis: In P.P. Rogers, M.R. Llamas & L. Martinez-Cortina (Eds.), *Myth or Reality*, 2006.61-92.
12. Migration and Global Environmental Change *Final Project Report*. The Government Office for Science, London, 2011.
13. Nezhad MZ, *et al*. Estimation of domestic water demand function in Ahvaz, Iran. *Herald Journal Economic and Finance*. 2012; 1(1):15-20.
14. Nketiah Amponsah E, *et al*. Conference on International Research on Food Security, Natural Resource Management and Rural Development. University of Hamburg, 2009.
15. Yao Z. Factors influencing bottled water drinking behavior: A survey on factors that shape people's beliefs on bottled water and tap water, 2011. DEA 1501. Retrievable from <http://www.courses.cit.cornell.edu/dea150/files/2011%20files/Project%203.pdf>