

## Distributional Pattern of Bottled Water Usage: A Case Study in Batticaloa District, Sri Lanka

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### Abstract

*The current trend of using bottled water shows the remarkable adaptation in the Eastern Province of Sri Lanka due to the development of industries (factories and garments), hotels and tourism. Numbers of distributors and sellers have increased because of the demand in these areas. Therefore, this study focuses on identifying the spatial distribution pattern of bottled water used for drinking purpose and the health impacts due to the adaptation of bottled water in Batticaloa District. Data were collected from the agents who supply bottled water in the Batticaloa District. Their trend of sales and geographical distribution pattern were analyzed. The study revealed that there is an increasing trend in the sales of the bottled water for the last 5 years in 5 DS divisions such as Koralai Pattu, Koralai Pattu North, Eravur Pattu, Manmunai North and Kattankudy among 14 DS divisions in the district, which are well known for its tourist places as well as urban activities. The trend would have been fully changed due to the awareness of ground water pollution and the usage of recycled water bottles, where a hidden link can be noticed between the geographical locations and factors influencing the bottled water distributional pattern in the district.*

**Keywords:** Bottled water, distribution, DS division, Geographical location, Ground water.

### Introduction

Water is one of the most essential natural resource contributing in ecological sustainability and livelihood performance of the people who dwell in the planet<sup>1</sup>. It becomes critical scarce in the coming years due to the increasing demand, rapid growth of urban populations and the development of agriculture and industrial activities<sup>2</sup>. Therefore, available water for the drinking purpose with an acceptable quality is the major issue in a country. Hence, the conservation, optimum utilization and management of this resource for the betterment of the economic status of the country become paramount<sup>3</sup>.

Bottled water market tripled over past 10 years in worldwide. More than 75% of the people in the world drink bottled water<sup>4</sup>. Consumers choose to drink bottled water for several reasons. The increasing usage of bottled water represents a change in ways of life, for example, the increasing urbanization deteriorates the quality of tap water, but at the same time, the increasing standard of living enables people to drive far and bring home heavy and expensive bottled water<sup>5</sup>.

**Use of bottled water in Sri Lanka:** In Sri Lanka, the usage of bottled water has shown a positive and increasing approach due to the increasing urbanization. Increasing number of suppliers to choose from offering a low cost product, with home/office delivery (Western Province mainly) and packed in the easiest way to use bottles show the tremendous increase in bottled water usage throughout Sri Lanka. Highly developed and

developing agricultural areas cause pollution due to the usage of fertilizer and pesticide to obtain a peak harvest from their cultivation. It is the fact that leads the people to attract by the water bottle industries and its health benefits. Handling of water with bottle is the easiest way rather than depending on the tap water with many concerns. Further, tourist consumption in bottled water grew at 35% over the three years (2008-2011) period due to the groundwater pollution and increased urbanization. Moreover, Tourism authority estimated the tourist consumption pattern and adaptation on using bottled water growth was up to 39 million litres in 2014 based on a conservative tourist arrivals growth rate of 15% per annum over the last three years (2011-2014) and seasonality too determines the usage of bottled water in tourism which highly takes place during the midterm (May to September) of the year.

In the North Central, North Western, Eastern and Northern Provinces there is a lack of good quality of water, as chemicals used for agriculture have contaminated water sources. This is also boosting the demand for bottled water in these regions. Higher percentage (33%) of bottled water is consumed in the Western Province (mainly due to increased urbanization and tourist arrivals), followed by Southern Province (20%) and Central Province (13%) while comparing with the other provinces (Survey report, 2015).

**Background of the study:** Higher percentage of people in Western Province takes much role in handling bottled water comparing with other provinces. Southern and Central

Provinces play a vital role than Eastern Province in last few years. However, this has been changed a lot due to the tremendous development in hotels and tourism in the Eastern Province. Numbers of distributors and sellers have increased because of the demand in these areas. Significant development of projects in the Eastern Province leads to increased number of tourists (local and foreign) in the region which enhances the bottled water sales and consumption. Even though Batticaloa is blessed with plenty of natural surface and ground water resources, use of bottled water for drinking purpose shows an increasing trend in the region. It seems to be mostly related with the hot spots (tourist places, cultural spots, traditional places, institutions, official places, etc) in the district and the abundance of the water bottle agencies.

**Objectives of the study:** This study is an attempt to provide a comprehensive review to find out the geographical pattern of the bottled water is being highly consumed or sold and find out the influence of bottled water agencies in the region and the health impacts related to drinking water quality in bottled water.

## Methodology

The secondary data for bottled water sales were collected from the bottled water sales agents in Batticaloa District in order to get the annual sales rate of the bottled water as well as the places that are mostly sold. Questionnaire survey and Key informant interviews were carried out with the distributors and health officers in order to get more information about the sales and relevant factors influencing the bottled water supply as well as the health impacts due to bottled water in Batticaloa District, Sri Lanka.

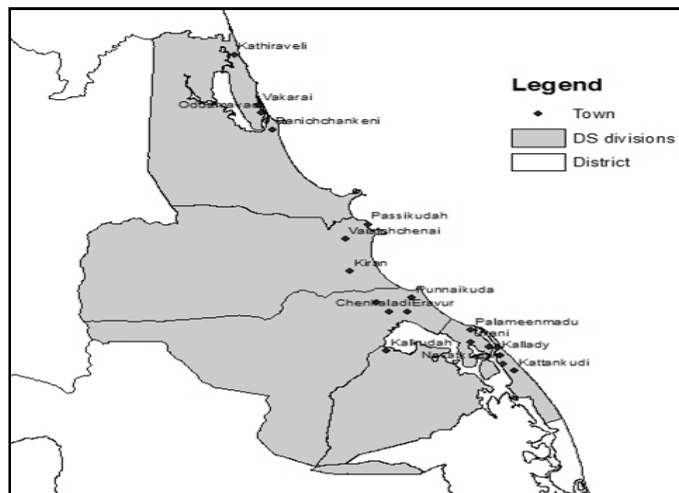
## Results and Discussion

**Spatial pattern of distribution of bottled water in Batticaloa District:** Batticaloa is very popular in terms of its geological nature and distributions of natural resources and aesthetic spots which intake more tourist arrival continuously. Most of the attractive areas warmly welcome the people who are from different parts of the world which is to be considered as a host where the bottled water usage is higher.

As the result from the questionnaire survey from the bottled water agents, 5 DS divisions such as Koralai Pattu, Koralai Pattu North, Eravur Pattu, Manmunai North and Kattankudy were identified as the highest distributional locations in the district among 14 DS divisions (Figure-1).

Koralai Pattu and Koralai Pattu North DS Divisions are well known for its tourist's places namely Pasikudah, Kalkudah and Vaharai. Manmunai North, Kattankudy and Eravur Pattu DS divisions are well known for the urban development which include Batticaloa, Kallady, New Kattankudy and Vantharumoolai GN Divisions itself. Vaharai, Kallady, Oddamawadi, Kalkudah, Pasikudah are considered to be the

places with the peak demand for bottled water which are identified as hot spots for tourism, hotels and resorts. Batticaloa and Kattankudy are the places of tourism and urbanization respectively, where most of the governments, non-government, private and public institutions fall.



**Figure-1**  
**Geographical sites of mineral water bottle distribution in Batticaloa**

**Distributors of Mineral Water Bottles in Batticaloa:** Various kinds of branded water bottles are sold out in Batticaloa District for the last 5 years. American, Speed, Paneer, Crstal, Sun Aqua, Wageesa, Crstal, Clear, Bio, Cool, Orzeon, Forestry, Pan, Laufh and Balagoda are some of the main agencies identified in the district who carry out the business for the last 5 years. But, more and more new agencies are emerging in the District in the bottled water market which increases the competition among the agencies in sales and distribution. However, their sales rate mainly depends on demand and supply of the particular brand. The price of the bottles varies from Rs. 40-300 based on its capacity which varies from 0.5 to 20 litres.

**Sales pattern of the distribution:** The collected sales records revealed that there is an increasing trend in the sales of the mineral water bottle for the last 5 years in the district showed high usage distribution among the selected 5 DS Divisions in the District which are well known for its tourist's spots and urban activities. The Figure-2 shows the trend in water bottle sales in the district. It shows an increasing trend for the last 5 years from 2010-2014.

The findings of key informant interviews show that the increasing urbanization activities, increased tourist arrivals, increased health concerns and increasing demand are the factors influencing the bottled water sales in the region.

The following figure (Figure-3) shows the sales variation over 1 year period in Batticaloa District. The trend in each volume of bottled water shows a clear bi-model pattern over the months.

The sales are high in the months of Jul-Sep and low in Nov-Jan, where it can be correlated with the climatic pattern of the district, where the high and low sales fall under the dry and rainy season simultaneously.

The graph also shows a little rise in the month of February-March where the ceremonial season starts which is related to Tamil and Hindu culture, along with the Tamil Panchangam calendar.

Sales records of the distributors show that 500 and 1000 ml volume bottles show high sale for the individual usage (shops,

canteens, institutions, etc) and 5 liter bottles for the collective usage such as weddings and other ceremonies.

The present study shows, that the major distributors in Batticaloa District fell under the category of sole agent (100%) and none of them were recognized with category of the sub agent system. Further, all the companies were functioned with the full time employment (100%) where they play a role as distributors in between 6 months to 5 years. In these circumstances, around 70%, 20% and 10% of the distributors' income was with the range of Rs. 30,000 to Rs. 40,000, Rs. 20,000 to Rs. 30,000 and above Rs. 40,000, respectively.

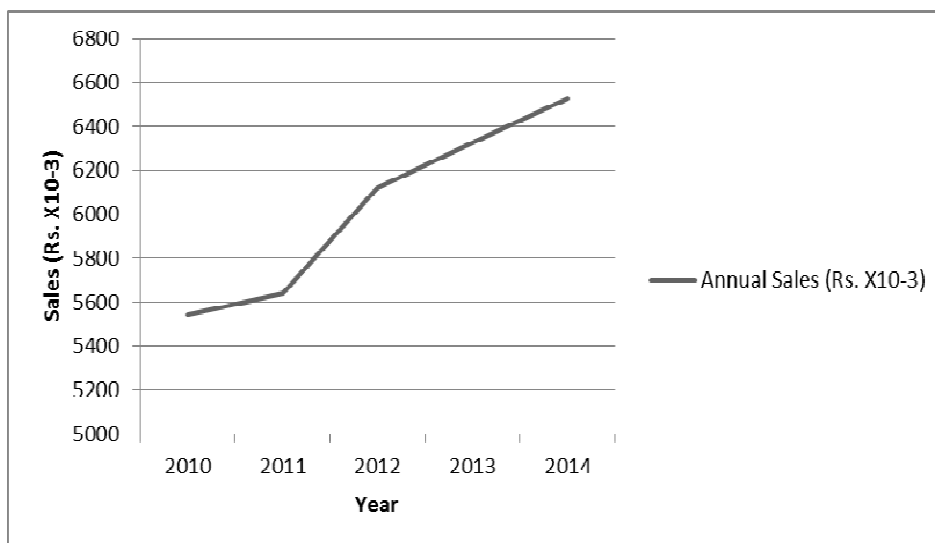


Figure-2  
 Sales details of mineral water bottle (2010-2014)

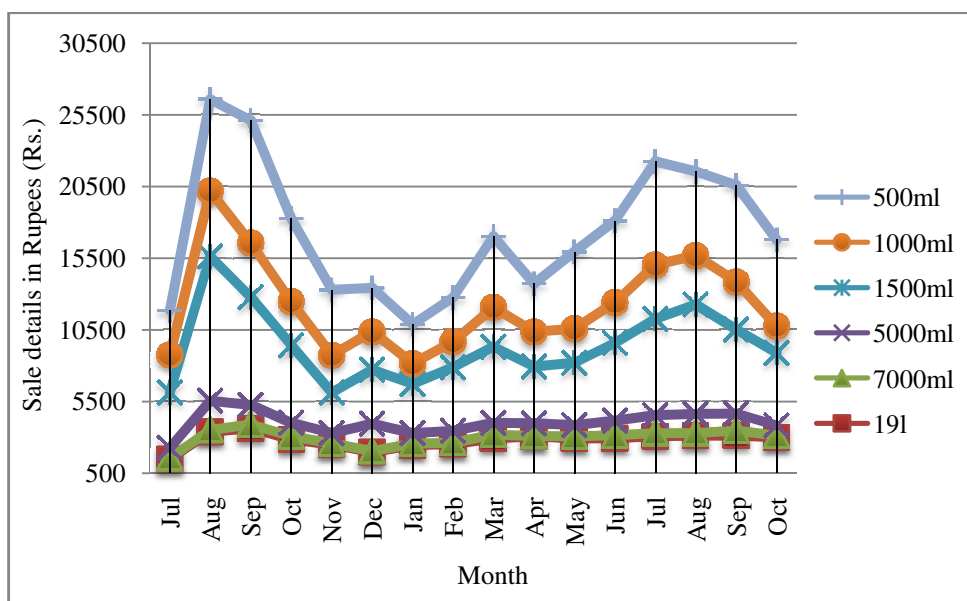


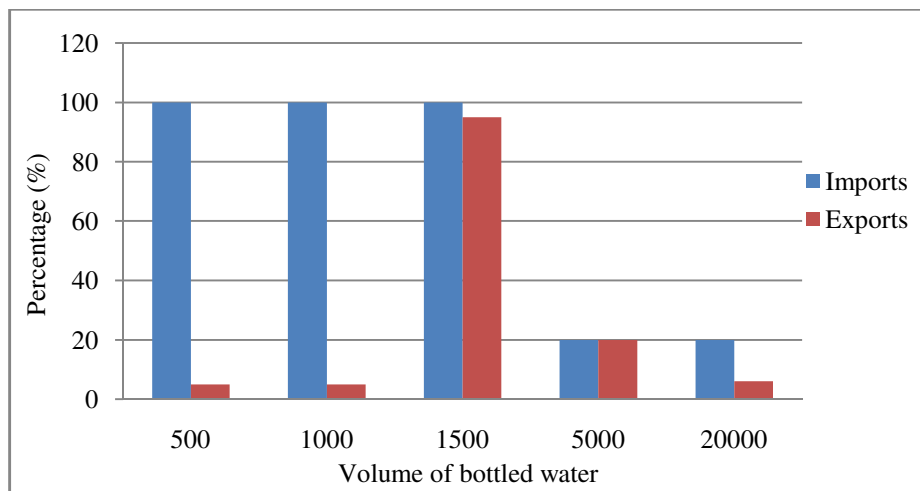
Figure-3  
 Sales details of mineral water bottle (2014-2015)

Moreover, the period of the conducting business (initiation of the business) in a particular place was another factor contributed a lot in the income generation of the particular agent. More than 80% of the distributors have begun their business within the period of 2010-2015 and such water bottle agents (20%) were developed during past decade (2005-2015). Along with the statements of the agents, season was another criterion influenced a lot in the consumers' demand in Batticaloa District. The demand of the consumers such as local people, tourists, staffs, students etc was higher in dry season (80%) while comparing with the wet season (20%) where the ground water pollution might be the reason for demand in wet season.

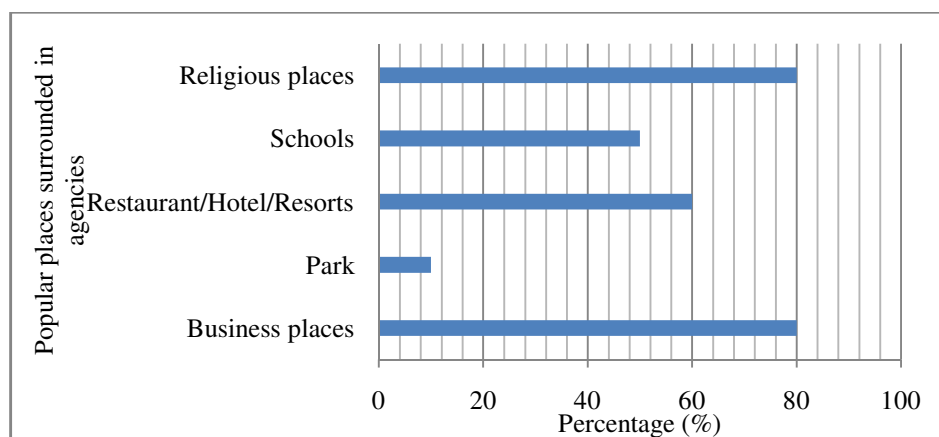
Further, different quantities of the mineral water bottles such as 500ml, 1000ml, 1500ml, 5 liter, 20 liter, etc were available for the consumers based on their demand (Figure-4). Among those quantities, 1500ml was highly demanded and imported by the agencies from the main agency located in Colombo District, Sri Lanka. Hence the transporting mode was their own vehicle, the transportation was easier and quicker than expected and no

middle men services were found. For the successful transportation, cardboard box (44%) and polythene bags (56%) were used by the agencies to prevent the damages which can be raised during the transportation from far for the storage. Present study revealed that the income was higher (67%) through the demanded bottle water and its distribution towards the consumers with the successful door delivery system in Batticaloa District, Sri Lanka.

The stored bottled water was mainly used for the official purposes by the office staffs (70%) and the rest of them (30%) were used for activities of domestic, ceremonies, hospitals, hotels and banks. And also, the identified locations which is nearby the water bottle companies were business places (80%), religious places (80%), hotels/restaurants/resorts (60%), schools (50%) and parks (10%). Those locations (Figure-5) were remarkable reason for the higher income generation from the demanded Quantity of the water bottle (1500ml) in Batticaloa District, Sri Lanka.



**Figure-4**  
**Imports and demand of bottled water bottle in Batticaloa District**



**Figure-5**  
**Identified locations nearby the agencies**

**Health impacts in the District:** Bottled water usage shows remarkable failures in its nature. Even though it is easier to handle, it gives the risk to the environment. According to 2001 report of the World Wide Fund for Nature (WWF), about 1.5 million tons of plastic are expended in the bottling of 89 billion liters of water each year. During the manufacturing of plastic bottles, higher energy is used to modify the bottles according to the consumer preferences. WWF suggests that besides the sheer number of plastic bottles produced each year, the energy required to manufacture and transport these bottles to market severely drains limited fossil fuels. Bottled water companies, due to their unregulated use of valuable resources and their production of billions of plastic bottles have presented a significant strain on the environment. And also, if the reusable concept followed simultaneously, it degrades the quality of water and while getting older it causes the leakages. Plastic drinking bottles contain many chemicals, some of which interfere with hormones in the body. Even though plastic drinking bottles are recyclable, most end up in landfills or as litter. The growing piles of our plastic garbage and litter threaten our wildlife and natural areas, making our world a less beautiful and less healthy place.

In Batticaloa district, tourist arrival places are ensured for its aesthetic values where open dumping is limited. Some local people are using those bottles to fill the tap water as recycling mode. However, awareness has been created among local people against the continuous usage of same bottles. Recycled bottles causing health impacts were also expressed through advertisements in different channels. As the result, employees who work in tourist hotels and people who live in urban area are requested to collect used water bottle in proper way and separately. Engineered landfills and dumping sites are available in Batticaloa district.

Further, plastics take a longer period to decay in soil which can be prolonged without incorporating with soil. And burning of plastic bottles causes dark fumes which leads to the environmental threats. For that, large number of burning are not allowed in urban areas and collected by Municipal Council in weekly basis. So, the impacts are away from the area where people are less crowded. The reason is fashion and attitude of using water bottle trend have been raised. The concept of ground water pollution and its usage are well known by the local people and tourists. Moreover, this trend will not be changed and simultaneously can be increased because of the trust on proper dumping sites in health benefits. It is a welcomed issue that people are aware with polluted water and its impacts as well as adopting bottled water by concerning its impacts on environment after the usage. When concerning the

health impacts not any noticeable impacts were observed and reported in the hospitals in the region.

## Conclusion

This study employed to find out the pattern of bottled water usage in the Batticaloa district. The represented aesthetic places in Batticaloa District boost the usage of water bottle shows a tremendous increase. People change their attitude from traditional way of purification to bottled water due to the easiness and time consuming. Further, engineered land filling and large scale recycling are promoted instead of open dumping by considering environment as well as health impacts. The trend would be fully changed due to the awareness of ground water pollution and the usage of recycled water bottles, where a hidden link can be noticed between geographical locations and factors influencing the mineral water bottle industry in the district which should be further studied.

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