PEOPLE'S ATTITUDE ON GROUND WATER CONSUMPTION: A CASE STUDY BASED ON PANADURA DIVISIONAL SECRETARIAT (DS) DIVISION

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ABSTRACT

Even though that more than 70% of the Earth surface is covered with water there is only a limited amount of consumable water on the planet for human consumption mainly as drinking water. Ground water resources are the main source of drinking water in many parts of the world. Precipitation is the main recharge factor of ground water areas whereas rivers, lakes and reservoirs are the main discharge areas by nature. To access ground water in micro levels people are using dug wells and tube wells mainly for their own consumption purpose by household chores. But many people do not have sound knowledge about ground water levels, changes of ground water, groundwater recharge and discharge, ground water contamination and etc. Therefore this study has conducted in order to examine the people's attitude on Ground water Consumption as a case study based on Panadura DS division. Main data collection method was a questionnaire survey based on four buffer regions as 500 m intervals from the coast since Panadura belongs to a coastal region. Samples have selected from the households where they have wells as an access to ground water. This study have identified that there is lack of awareness about ground water among people. Most people do not use ground water for consumption in the first buffer region since they indicate high salinity levels. But the quality of ground water increases with the distance from the shore line to the inland.

***Key words*:** Ground Water, Sea Water Intrusion

1. INTRODUCTION

Water is the most valuable natural resource in the Earth. It is highly essential for all living beings to sustain their lives. The amount of consumable water in earth is decreasing rapidly mainly due to anthropogenic activities. It is the responsibility of mankind to conserve the available water for the future generation. When considering the more than 70% of the water which covered the Earth surface, 97.1% is sea water which cannot be used for normal day to day activities due to high salinity. Access to safe drinking water is essential for humans and other life forms. Therefore awareness on ground water is essential when it comes to conservation and protection under the concepts of sustainable development.

Panadura DS division located with one boundary as the Indian Ocean. Oceans carry a huge mass of saline water normally indicates infiltration through the soil layers towards the inlands. But infiltration cause by the precipitation will recharge ground water aquifers with fresh water creating thin layer of fresh water aquifers on top of the infiltrated saline water near the coastal areas. Therefore identifying the certain depth to construct certain wells provide access to fresh water even near the shore line but digging much deeper well will provide more saline water even though they are located little far from the shore line. This study has mainly conducted to investigate the awareness of people regarding the above matter when consuming ground water.

2. METHODOLOGY

2.1. Procedure for Analysis

Main method of data collection was a questionnaire survey to collect primary data on people's attitude on ground water consumption. In order to conduct the questionnaire survey, sample of household were selected from Panadura DS division which has access to ground water under stratified random sampling method.

Households who have dug wells are only eligible for the sample and sample was stratified in to four segments based on the distance from the shore line as shore line to the 500m, 500 – 1000m, 1000- 1500m and 1500 – 2000m. Therefore area of 2km from the shore line was selected as the area of study. Questionnaire survey was executed by conducting 20 questionnaires in each buffer region. Altogether there were 80 questionnaires. This will provide a proper understating about changes of groundwater consumption along with the distance from the shore line.

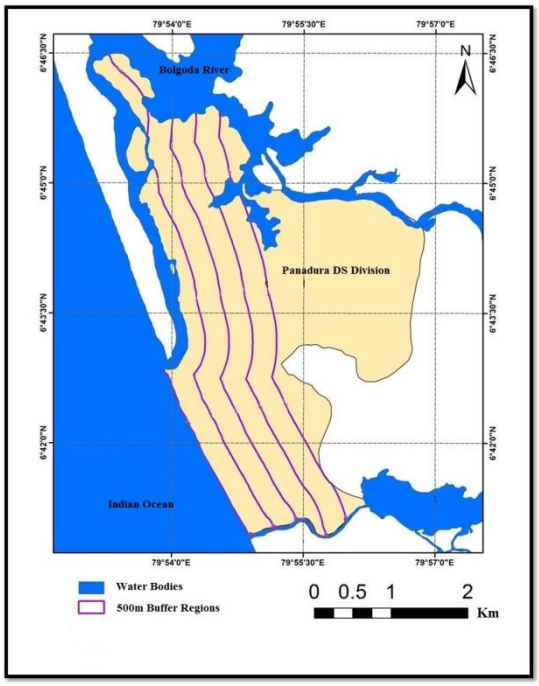

Figure 1: Area of Study

(Source: Prepared by the Author based on Data produced by the Department of survey)

Methodology of the study can be segmented in to three as data collection, data analysis and data presentation. Main methods of data analysis are measures of central tendency and measures of dispersion under statistical analysis. Both qualitative and quantitative methods were used in analysing the results of the questionnaire survey. To present the results mainly graphs, charts and tables were used.

3. RESULTS

This study has shown that there are certain issues regarding the consumption of ground water and many households are using alternative sources to fulfil their day to day water needs than ground water. Due to the development of infrastructure and water distribution by the water supply and drainage board many households are using the tap line. 65% of the sample has access to the water distributed by the water supply and drainage board along with the wells.

Figure 2 shows that, From the sample 45% of households use ground water (dug wells) to fulfil their drinking water needs whereas 55% of households does not use ground water for drinking purpose.

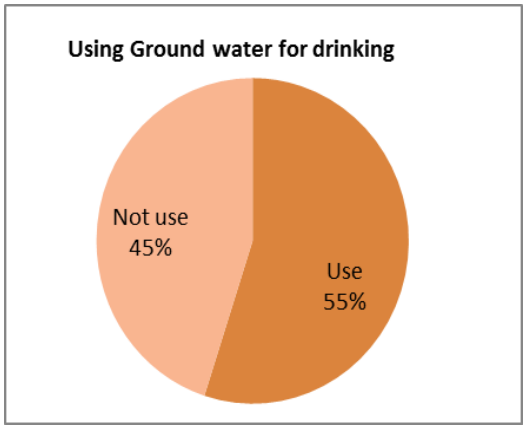

Figure 2: Using Ground water for drinking purpose
(Source: Ground water survey, 2014.)

Further, Figure 3 has also indicate that it is only 35% of households uses ground water daily and 30% uses wells only when the water supply is disconnected from the main line.

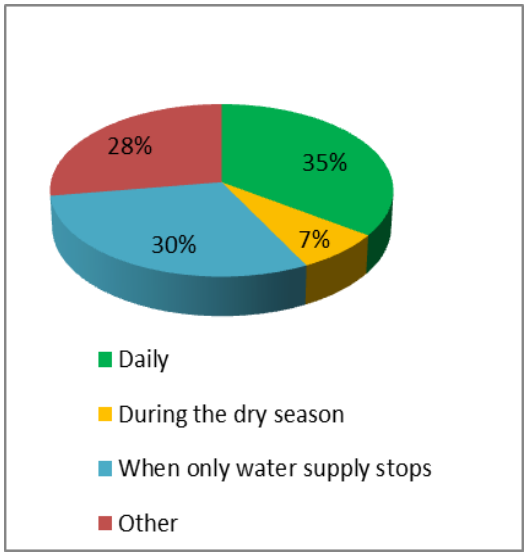

Figure 3: How often people use dug wells
(Source: Ground water survey, 2014.)

Since Panadura DSD is an urban area there is a continuous supply from the water supply and drainage board of Sri Lanka. Therefore use of ground water is limited in the city area.

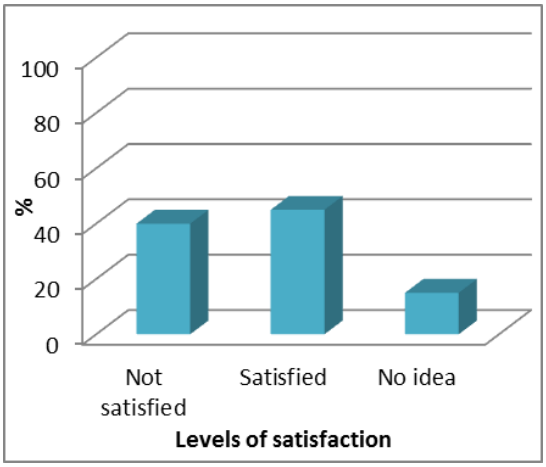

Figure 4: Satisfaction level of people about ground water

(Source: Ground water survey, 2014.)

According to Figure 4 only 40% of the sample is satisfied with the quality of ground water and 45% of the sample directly mentioned that they are not satisfied with the water quality. Most of these houses are located near the shore line and increasing levels of saline is the main causal factor. 55% of the total sample does not use ground water for drinking purpose. According to Figure 5 main reasons for this can be identified as taste of the water, colour of the water, odor of the water and the salinity levels of the water. In this area 20% of wells have saline water and 68% have somewhat saline water.

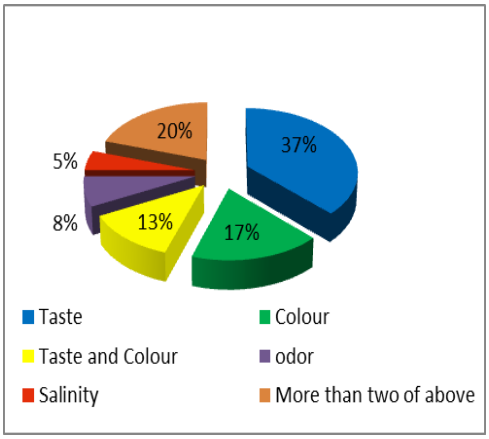

Figure 5: Reasons for not using ground water

(Source: Ground water survey, 2014.)

Main reason for not using ground water is the taste of the water. With the sea water intrusion the level of salinity in some wells have increased. Therefore the taste of water in the wells are brackish and people will not tend to consume water from the wells. Considerable amount of wells are with non-transparent water. According to the survey there are 20 present of the wells have taste of brackish water. 68 present of the wells have moderately brackish taste in water. Totally 88 present of the wells have the taste of saline water.

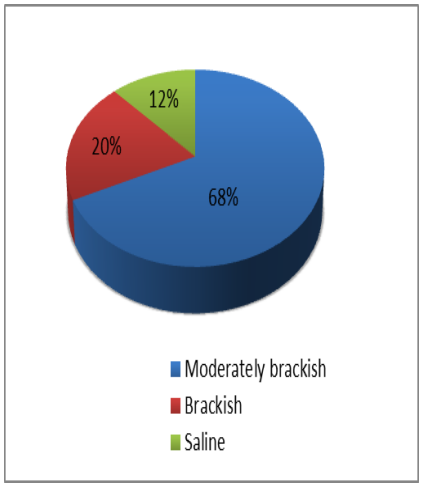

Figure 6: Taste of the ground water

(Source: Ground water survey, 2014.)

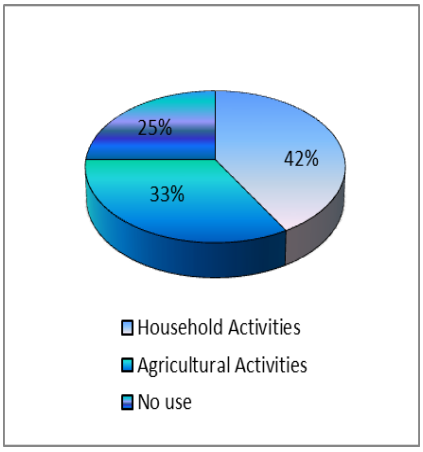

Figure 07: Use of ground water which is not using for drinking

(Source: Ground water survey, 2014.)

Figure 7 shows that, 42 % of the well water is used for household day to day activities whereas 33% of wells are used of agricultural activities which are located away from the sea. 25 % of the selected wells are not used for either household activities or agricultural activities. 45% of the

sample population believe that there is an impact from the sea to ground water and 35% of the sample says that there is no impact of sea to the ground water. 20% of the sample unaware of the sea water intrusion toward the groundwater.

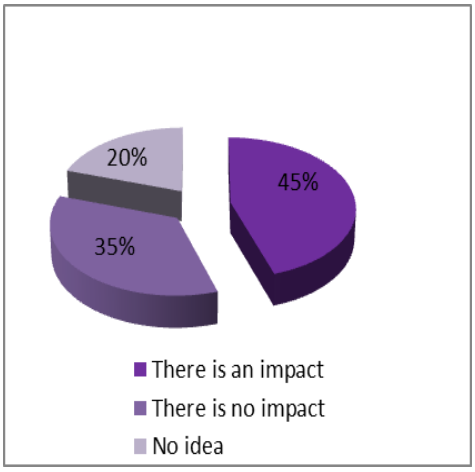

Figure 08: Impact of sea for ground water according to people
(Source: Ground water survey, 2014.)

Questionnaire was also focused on examine the people's awareness on what ground water is? 60% of people believe that pure water is water with good taste, without bad odor and absence of any material. 10%, 12% and 18% of the people says that pure water means water with good taste, without bad odor and absence of material respectively.

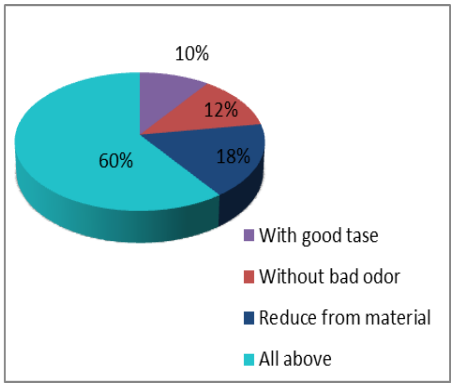

Figure 9: Perception on pure water
(Source: Ground water survey, 2014.)

Many people use purification methods when consuming ground water. Figure 10 shows that, 37 % of the sample uses boiling as the main purification method, and 30 % of the sample believe that the ground water is pure and no need of purification. Some people uses filtering methods to purify groundwater before consuming and 10% says they add chlorine to ground water,

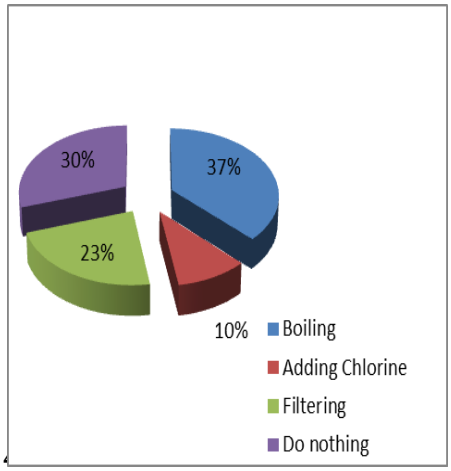

Figure 10: Water purification methods
(Source: Ground water survey, 2014.)

4. CONCLUSION

Most households' do not have proper awareness about the behaviour of ground water and how it changes along with the changes of the environment. But they do possess a sound knowledge from the practice about use of ground water during wet dry seasons. 45% of households strongly believe that there is an impact from the sea for the quality of the water in dug wells. Also this study has shown than most of households are using filtering, boiling and adding chlorine as purification methods of ground water. Most of the wells have dug deeper t access quality ground water but it reaches the beneath saline water and have made the water in wells more saline too. Some wells near the shore line which is not that much deeper extract fresh quality water but the issue is they will drain on heavy dry seasons.

5. REFERENCES

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