

## Study Findings

The study discovered that carbonated bubbling stream water can be treated to remove bacteria Ecoli, Coliforms, Pseudomonas aeruginosa and Iron sulphite reducing anaerobes resulting in generation of pure carbon water. The process of treating bubbling spring water is safe, cheap and affordable. The treated carbonated bubbling water has health benefits including cutting down calories for people challenged by obesity issues as well as reducing incidences of constipation.

## Policy Recommendations

- Arising from the study, the following policy recommendations are made;
1. Kilibwoni Bubbling spring water can be treated to produce carbonated water and as such a water treatment plant should be set up for production of carbonated water for use in the market.
  2. To ensure sustainable harvesting of of Kilibwoni bubbling spring water, conservation and environmental protection of water points and its catchment should be put as a priority by the community, National and County governments as well as environmentalists at large.
  3. Documentation of quality and quantity of spring water in Kenya should be carried out by County and National Governments and be made available for use like in the case of Kilibwoni bubbling spring water.

## ACKNOWLEDGEMENT

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## References

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## IMPROVING STANDARD OF LIVING OF RURAL COMMUNITIES THROUGH TREATMENT AND COMMERCIALIZATION OF CARBONATED KILIBWONI BUBBLING SPRING WATER IN NANDI COUNTY

### Introduction

Water is life and it is a scarce resource which requires sound planning and conservation. The WHO standards require that at least 50 litres of water should be available for various uses per person per day. It is assumed that per capita water consumption per person per day is 2 -3 litres. However, this target is not met because water is scarce. Globally 97.5 % of water is salty while a paltry 2.5 % of water is fresh water and therefore available for use by humanity (Kipkorir,2016). In addition, the demand for carbonated water use globally and in Kenya in particular is on the increasing trend consequential from emerging life health threatening situations like obesity, which require that for one to reduce weight and remain healthy; a lot of carbon water is to be taken throughout the day (Steen et al,2008, Schoppen et al 2004). The current method of accessing carbonated water is through companies that prepare carbonated water, where chemicals are added to water before being released into the market for sale. The carbonated water in the market is expensive and out of reach by majority of consumers. There exists an underground water natural spring in Kiplolok site of Kilibwoni area of Nandi County which has been discovered and which has the capacity to produce carbonated water cheaply and in an affordable way. The carbonated water so discovered can be treated and processed for sale in the market resulting in income generation for the benefit of local communities and attendant enhancement of their standard of living.

### Why Carbonated Water??

- Carbonated water from bubbling spring water is important as it helps in improving health and productivity in terms of dealing with weight loss and addressing problems related to indigestion.
- Cost of health economic burden will be reduced, consequential from usage of carbonated water
- Carbonated Bubbling spring water provides a safe, cheap and affordable source of carbonated water
- Harnessing of carbonated water involves setting up of a water treatment plant resulting in job creation directly for people who will be working in the processing plant or indirectly by people who will be selling and marketing carbonated water product.
- Revenues and levies will accrue to Nandi County Government and in the National Government levels from associated carbonated water processes

- Carbonated bubbling spring water project will induce supportive infrastructure and skills transfer, important for local community development
- Harnessing of carbonated water will provide an opportunity for water resource conservation resulting in environmental enhancement.



Figure 1. Carbonated Water and its ripple effects

## What Constitutes Bubbling Spring water?

The main objective of the research project was to determine the chemical composition of Kilibwoni bubbling Spring Water, and this was achieved by taking water samples from water points from bubbling spring water in Kiplolok site in Kilibwoni area.

Water Samples were collected from bubbling spring water points in the months of November 2018 and February 2019 where three samples from each point were tested for carbonation, chemical, physio-chemical and microbial analysis Laboratory analysis was conducted in Kenya Bureau of Standards (KEBS) laboratories in Eldoret and Nairobi Laboratories, and with the help of KEBS Experts. Global Positioning System (GPS) was used to capture spatial data involving mapping out of Coordinates for Sampling water points.

## Findings of Analysis of Bubbling Spring water

Figure 2. shows the site where samples of bubbling spring water were obtained, while Plate 1. shows existing bubbling spring water points in Kiplolok site of Kilibwoni area in Nandi County.

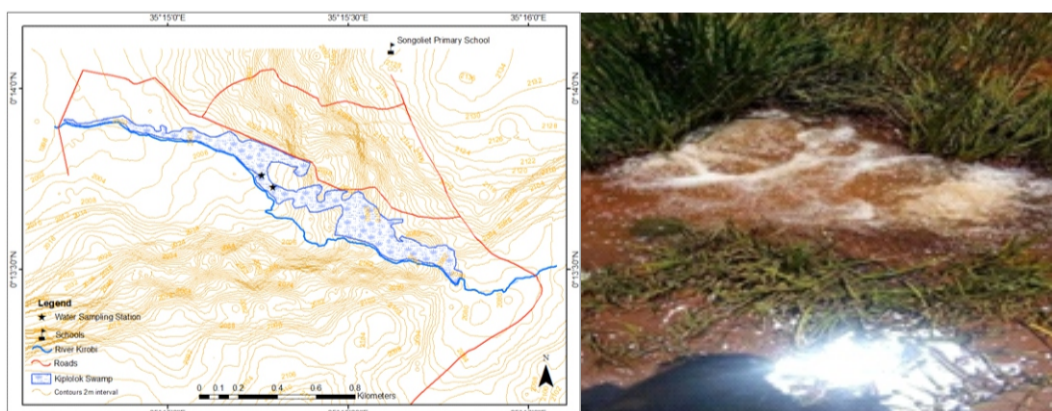


Figure 2. Bubbling spring water points in kiplolok, Kilibwoni Area Plate 1: Kiplolok Bubbling Spring Water

The results of analysis of water samples which were taken randomly from Kiplolok bubbling spring in Kilibwoni area are as shown in Figure 3.

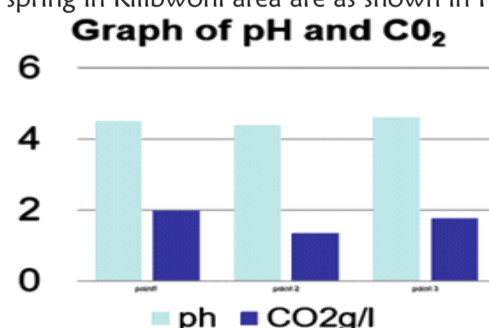


Figure 3. Results of ph and Co2

The results of water analysis showed that the pH result for all the three points ranged from 4.4 to 4.6 and 5.0 to 6.6 for phase one and two respectively which is above 4 standard set, as the minimum by KEBS. Results for carbon dioxide range was between 1.35g/L to 2.0g/L and 2.2g/L to 2.72g/L respectively. All the chemical and physio-chemical parameters were within the standards set by the KEBS and World Health Organization (WHO) (Steen et al,2008, Schoppen et al 2004). However, this water was found to have bacteria such as E. coli, Coliforms, Pseudomonas aeruginosa and Iron sulphite reducing anaerobes.