EFFECTIVENESS OF COCOFILTER IN REDUCINGTHE RISK OF MICROORGANISMS CAUSING WATERBORNE DISEASES

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PROJECT DESCRIPTION

- According to the World Health Organization, the mortality of water associated diseases exceeds 5 million people per year (Cabral, 2010).

- Water is basically needed to sustain life not to harm, testing the potability of water sources that people are using is quite a necessity in order to access a clean and safe drinking water.

- Based on the Community Diagnosis gathered last 2016, majority of the residents in Barangay Salvacion, Pamplona, use community-owned deep wells as their source of drinking water with 97% for the overall zones. The location of some of the deep wells had a distance of 0-10m, with the percentage of 92.3%, from the poultry farm and pig pens owned by the residents.

OBJECTIVES

- To determine the degree of presence of microorganisms in the drinking water before and after the filtration process, to the selected areas of Zones 1 and 2 of Barangay Salvacion, Pamplona, Camarines Sur

- To identify the implications towards the development of health programs which can be drawn based from the result of the study

METHODOLOGY

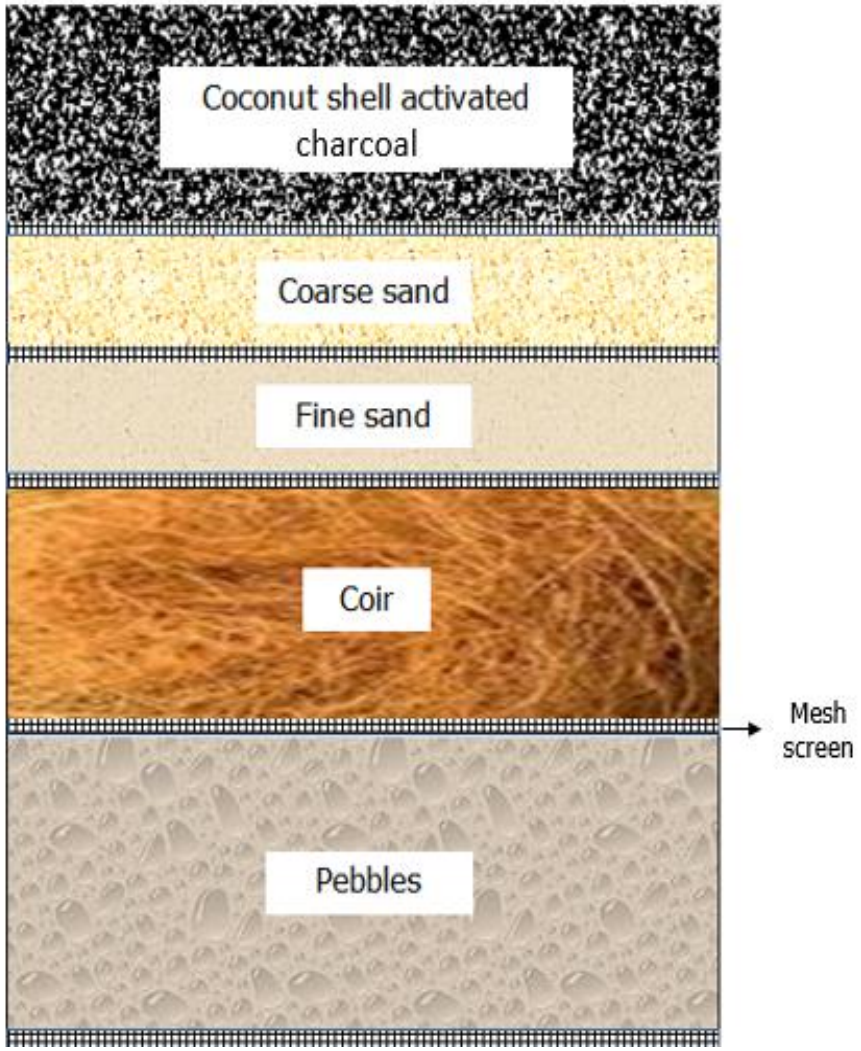

Fig. 1. Elements used in the cartridge of the CocoFilter (filters #1 and #2)

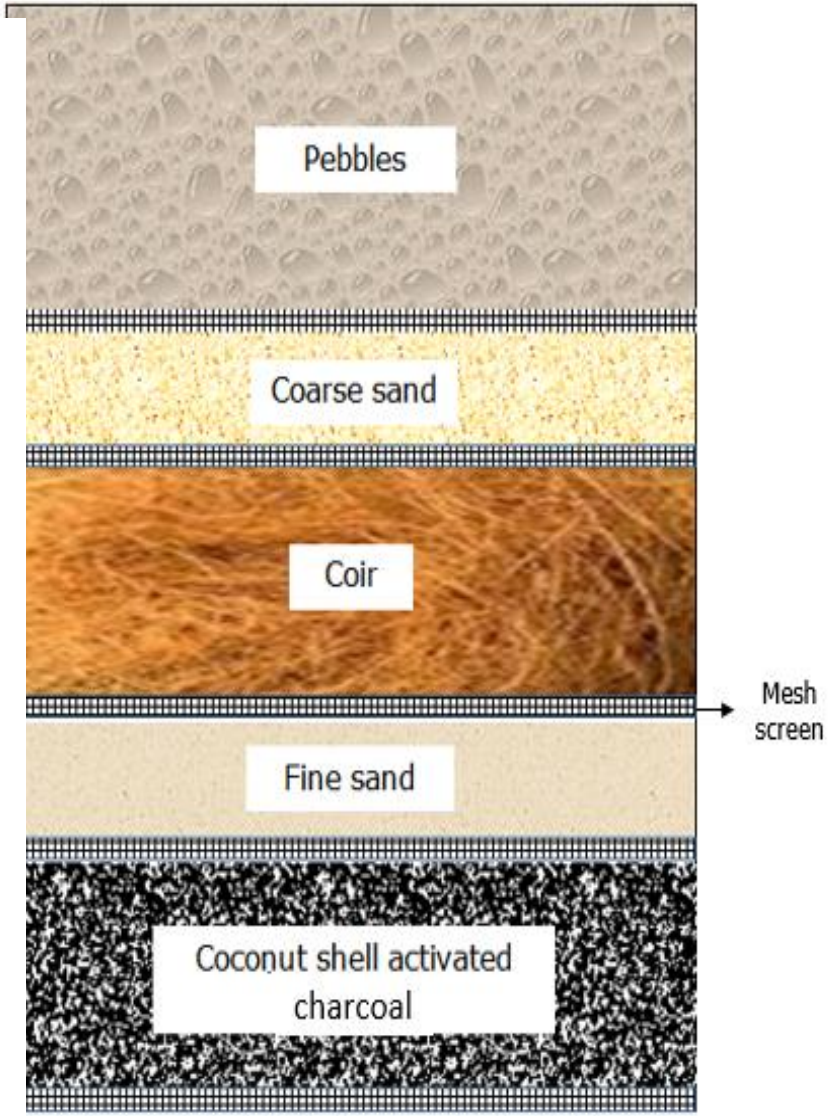

Fig. 2. Elements used in the cartridge of the CocoFilter (filter #3)

Data Gathering

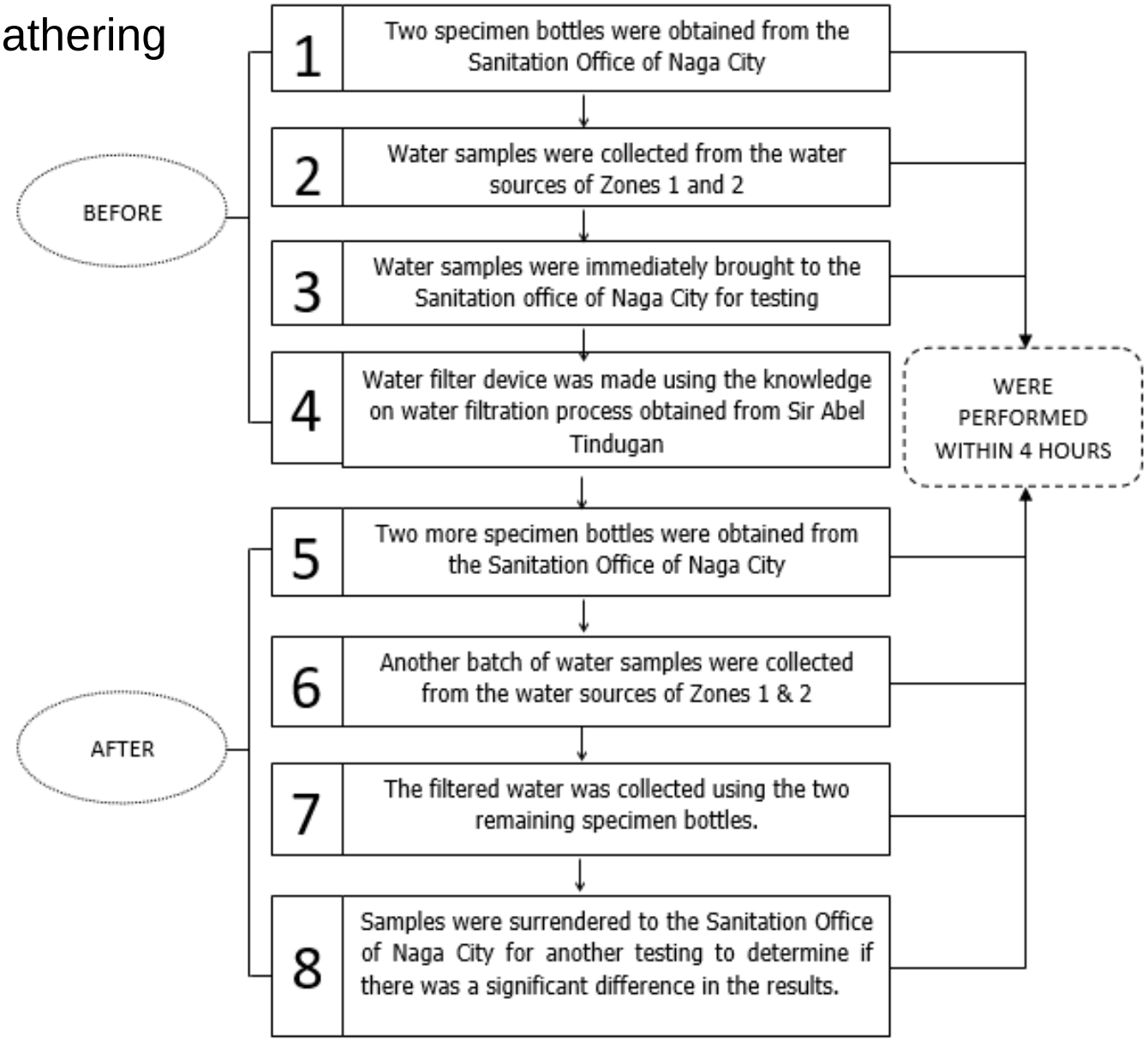

Fig. 3. Step-by-step process for data gathering

RESULTS

Table 1

Microbiological Test Result as Baseline Data (Zone 1)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**

Table 2

Microbiological Test Result as Baseline Data (Zone 2)

Test	**Unit**	**Method of Analysis**	**Results**	**PNSDW* Standards**	**Remarks**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**

Table 3

Microbiological Test Result for Set-Up #1 (Zone 1)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Heterotrophic Plate Count	CFU/mL	Pour Plate Method	Less than 30	Less than 500	**PASSED**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**

Table 4

Microbiological Test Result for Set-Up #1 (Zone 2)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Heterotrophic Plate Count	CFU/mL	Pour Plate Method	Less than 30	Less than 500	**PASSED**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**

Table 5

Microbiological Test Result for Set-Up #2 (Zone 1)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Heterotrophic Plate Count	CFU/Ml	Pour Plate Method	Less than 30	Less than 500	**PASSED**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**

Table 6

Microbiological Test Result for Set-Up #2 (Zone 2)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Heterotrophic Plate Count	CFU/mL	Pour Plate Method	Less than 30	Less than 500	**PASSED**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Greater than 8.0	Less than 1.1	**FAILED**

Table 7

Microbiological Test Result for Set-Up #3 (Zone 1)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Heterotrophic Plate Count	CFU/mL	Pour Plate Method	Less than 1	Less than 500	**PASSED**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Less than 1.1	Less than 1.1	**PASSED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	Less than 1.1	Less than 1.1	**PASSED**

Table 8

Microbiological Test Result for Set-Up #3 (Zone 3)

Test	Unit	Method of Analysis	Results	PNSDW* Standards	Remarks
Heterotrophic Plate Count	CFU/mL	Pour Plate Method	Less than 30	Less than 500	**PASSED**
Total Coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	8.0	Less than 1.1	**FAILED**
Fecal coliform	MPN/ 100 mL	Multiple Fermentation Tube Technique	4.6	Less than 1.1	**FAILED**

CONCLUSION

- Given the results of the study, it can be fairly stated that the improvised Coco Filter device is quite effective as water contaminants reducer to produce a clean water for the people of the community.

- The outcome of the study implies that there should be active health programs providing vaccinations addressing to the possible waterborne diseases such as diarrhea, typhoid fever, amoebiasis and cholera that can be acquired through drinking water from the deep well. Also, it implies the need for reconsidering the placements of the water sources.

RECOMMENDATION

- It is recommended for the future researches to focus on the potability of the water source
- As for the device, it is recommended to further enhance the quality and the amount of the components to be use for a complete assurance of its effectiveness
- As for the process making, it is strictly recommended to undergo thorough sterilization of the materials and maintaining aseptic technique in handling and assembling the device all throughout the process
- As for more effective result, it is highly recommended to identify the specific microorganisms causing waterborne diseases and its number present in the water sources