

Tidal Energy Towards Utilization of Potable Water from a Jetmatic Pump and Prime Water in the Philippines

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Abstract- *This research examined drinking water quality in Leyte and other Samar cities. It examined the physical, chemical, and microbiological aspects of drinking water sources. This study used one jetmatic pump per barangay. Five evaluators found no color, odor, or flavor in water from all three locations. Brgy. Brgy. Minuhang Barugo, Leyte has a pH of 6.14, Brgy. All Sta. Rosa water samples are somewhat acidic with a pH of 6.3. Brgy temps. Brgy. Minuhang had the greatest temperature of 28.2°C and Brgy. Sta. Rosa's total dissolved solids (TDS) are 108mg/L, 39.7mg/L, and 156mg/L, respectively. Brgy. Because it was a dumpsite, Sta. Rosa has the highest TDS of the three brgy's, although it is still within the Philippine National Environmental Standards of Drinking Water. Three water samples meet the Philippine National Standard of Drinking Water (PNSDW) for Calcium, Chloride, DO, Iron, Manganese, Nitrite, and Potassium. E.coli was found in Brgys, Sta Rosa, and Abango water samples. Thus, none of the three barangay water samples are drinkable. Since all water sources are unsuitable for human consumption, LGUs must hold seminars/trainings on water filtration and treatment to protect everyone's safety. The relevant committee must routinely check potable water sources for health.*

Indexed Terms- *Jetmatic, Potable Water, Tidal Energy, Prime Water, Pump*

I. INTRODUCTION

Water plays an important role in many natural processes and is essential in countless physical and chemical reactions. Water is essential to all living organisms. Since water in our bodies is continuously used or lost, it must be continuously replenished.

Access to safe drinking water is essential for human survival and one of the fundamentals for a good and prosperous society. This was officially recognized

Internationally, on July 28, 2010, the United Nations General Assembly recognized "the right to water and sanitation as a fundamental human right for the full enjoyment of life and all other human rights" (UN Human Rights Council, 2011). Sources of safe water is essential for every human being, drinking safe water prevents humans and other animals from dehydration, deadly diseases and other environmental effects. There are many sources of potable water including underground reservoirs, rivers and lakes but these sources of water is crucial because of livestock waste, human sewage, chemicals, and other Contaminants that can cause illness when used for imbibing, cleansing, and other personal hygiene activities. The development of technologies for the provision of pure and abundant potable water has been a defining characteristic of prosperous civilizations. Jetmatic pump is a small discharge of rapidly moving steam, air, water, or other fluid that lifts or moves by its impulse. Primarily, it is used for household water supply from a well, driven point system, or open water source that is propelled by electricity 2 and can be converted to potable water. Prime Water has a branch in Camiling, Tarlac, which functions as the water distributor for the area. This water is treated with basic filtration techniques such as flocculation, which adds chemicals to the water to cause particles to thicken and float so they can be removed, Sand filtration, which removes large detritus, and chlorination, which adds chlorine to the water to eliminate bacteria and microorganisms, are both used to purify drinking water. Even though the EPA considers faucet water to be potable, it can cause numerous issues. Even though our bodies can technically manage chlorine, it is not

Table 1. Summary of the Physical Properties of the three selected barangay in Abango, Minuhang, and Sta. Rosa

Physical Properties	PNSWD	Abango	Minuhang	Sta. Rosa
Odor	No Objectionable	Odorless	Odorless	Odorless
Color	No Objectionable	Colorless	Colorless	Colorless
pH	6.5-8.5	6.23	6.14	6.27
Taste	No	Tastelless	Tasteless	Tasteless
Temperature	24-28°C	28.2°C	28°C	26.7°C
TDS	500mg/L	108 mg/L	39.7 mg/L	156 mg/L

Table 1 showed that the color, odor and taste of the water samples from jetmatic pump sources were not objectionable. The PHs of all water sampling sites was slightly acidic which is within the range of 6.5-8.5 which is acceptable. Total dissolved solids (TDS) in three water sources are all acceptable. But then it was found out that Brgy. Abango has the highest total dissolved solids value which indicates that maybe because before, it was a dumping area and it is flooded always during rainy season.

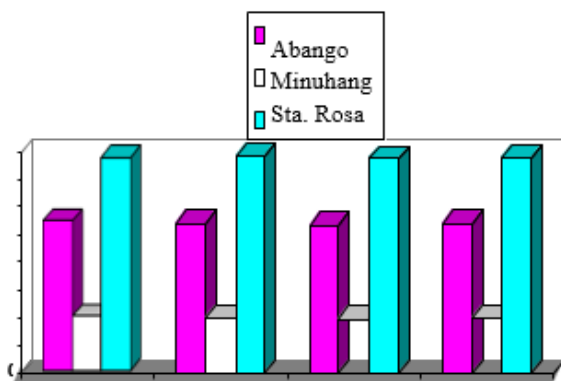


Figure 2. Result table for a Residential Water Pump System in Connection to Tidal Energy

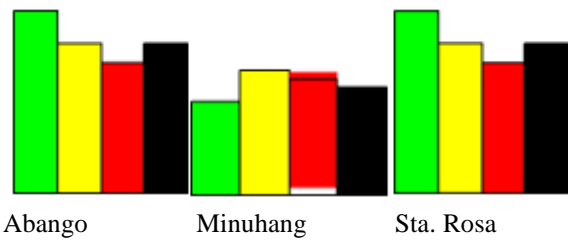


Figure 3. Water pH Level among barangays

Figure 3 Shows that the Barangay Abango, Minuhang and Sta. Rosa have a similar pH which is all are slightly acidic nearly neutral. pH has a permissible limit of 6.5-8.5 which is the pH of all water sample sources are all acceptable based on the PNSDW.

• Determination of Chemical Properties

The chemical properties of water samples from jetmatic pumps in terms of calcium, chloride, DO (Dissolved Oxygen), iron, manganese, nitrite, and potassium.

Table 2. Summary of the Chemical Properties of the three selected barangays in Barugo Leyte

Chemical Properties	PNSWD (Mg/L)	Abango	Minuhang	Sta. Rosa
Calcium	75	3.99	2.92	32.74
Chloride	250	130	96.7	101.7
Do	Minimum of 5 the higher the better	4.63	4.48	5
Iron	1.0	0.39	0.24	0.20
Manganese	≤0.50	0.089	0.89 (not acceptable)	0.108
Nitrite	≤3	0.007	0.006	0.110
Potassium		3.02	0.59	44.35

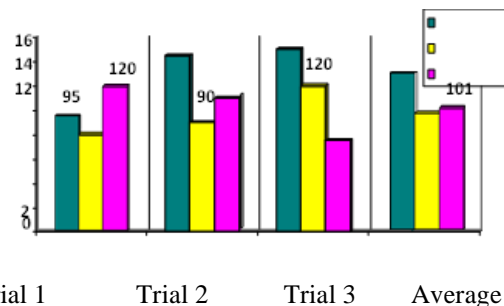


Figure 4. Total Dissolved Solids in Three Water Sources

Figure 4 shows that Total dissolved solids (TDS) in three water sources are all acceptable. But then it was found out that Brgy. Minuhang has the highest total dissolved solids value which has the highest total dissolved solids value which indicates because before, it was a dumping area and it is flooded during rainy season.

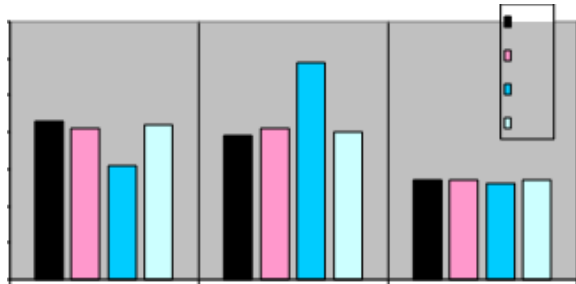


Figure 5. Estimate of Water Samples in Three Barangays

Figure 5 shows the temperatures of each water sources are acceptable. Temperature has a permissible limit of 24-28°C. It implies that the temperature is normal with three sampling sites. Temperature is normal with three sampling sites.

Figure 6 shows that the three water samples sources the highest chloride value was Brgy. Abango with the value of 130 mg/L it is contaminated with some chemical used in the farm. But all water sample sources were acceptable.



Figure 6. Three Water Samples Sources with Different Chloride Level

Bacteriological Properties

Table 3 shows that the dissolved oxygen (DO) only Brgy. Minuhang got the highest value which is implies better quality of water. It indicates that the jetmatic pump source of water is higher than the sea water level.

Table 3. Dissolved Oxygen Level among the Three Barangays

Bacteriological Properties	PNSDW Maximum Level	Abango	Minuhang	Sta. Rosa
E.coli	1.1	3.6	16	>23.0

Table 3 shows that all water sample sources tested positive for E.coli, affecting water sanitation.

CONCLUSIONS AND RECOMMENDATION

• **Conclusion**

The outcomes of the study allowed researchers to draw the following inferences and conclusions. All of the water samples that were taken from the various sampling locations met the PNSDW's criteria for drinkable water in terms of their physical attributes. The research was only able to calculate the energy that can be extracted from water while it was functioning between high tide and low tide, despite the fact that the test was performed on a device that was designed to work in both of these states. Because our apparatus is intended to function only between times of high and low tide, information that falls outside of this parameter will not be taken into account. When the tide is too low, optimization is not a cost-effective strategy of saving energy since it increases consumption.

• **Recommendation**

Based on the result and conclusions of this study the researcher would like to recommend the following:

It is necessary to have a device or a converter that can provide or support energy even if it is too low and is unable to fulfill the energy criteria of usage on the calculation of drinkable water based on the area and the amount of tidal energy that is used as well as the weather forecast.

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