

# GRAVITY FED WATER SYSTEM FOR VANUATU

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## The Need

Imagine having to walk a few miles in order to get access to clean water so that you can take a shower or make a cup of coffee. This is the problem experienced by villagers of the island of Espiritu Santo, Vanuatu.

By providing access to water within their villages, the villagers will no longer have to walk miles to retrieve water from the nearby river. Without easy access to clean water, health risks will increase among the villagers. Furthermore, simple tasks such as washing clothes are severely hindered and can become difficult and tiring tasks instead.



## The Solution

A Gravity Fed Water System is a sustainable water system that can transport water from a nearby spring located on a mountain ridge to a number of villages with zero energy footprint.

## The Partner

The Gravity Fed Water project partners with Friends in Action International to collaborate with and serve our brothers and sisters in Espiritu Santo, Vanuatu.

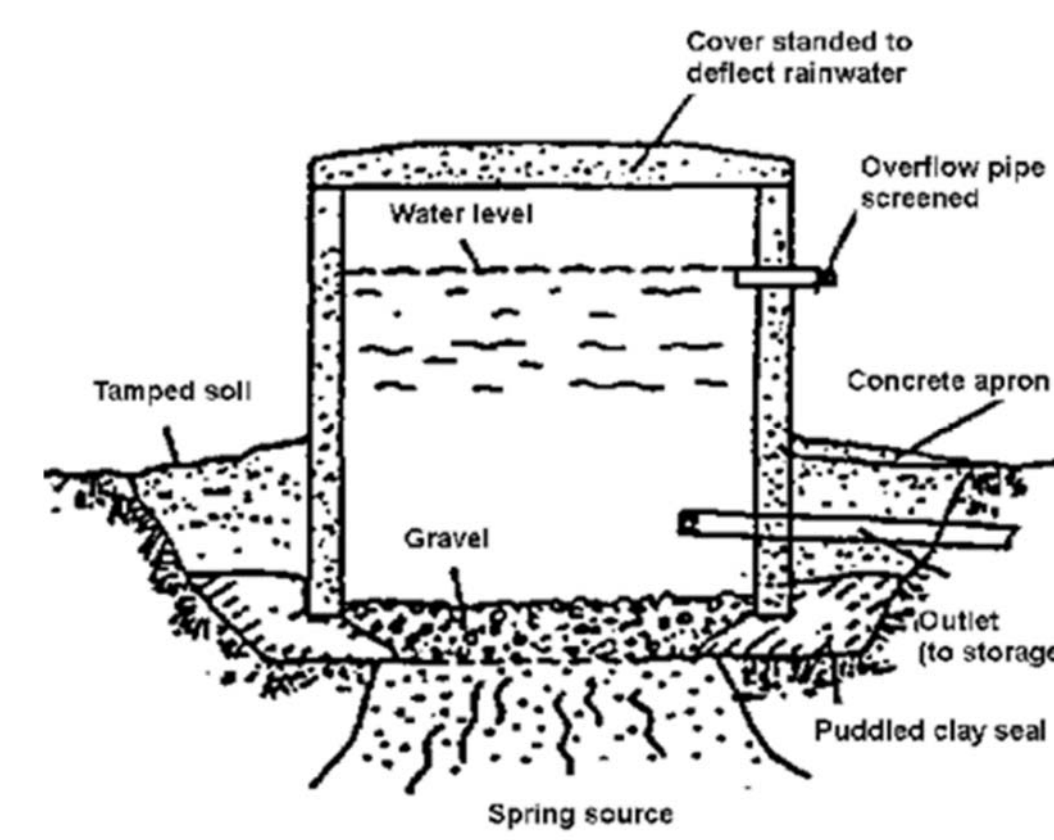


## The Gravity Fed Water System

Our gravity fed water system consists of three main parts:

### 1. Intake Structure

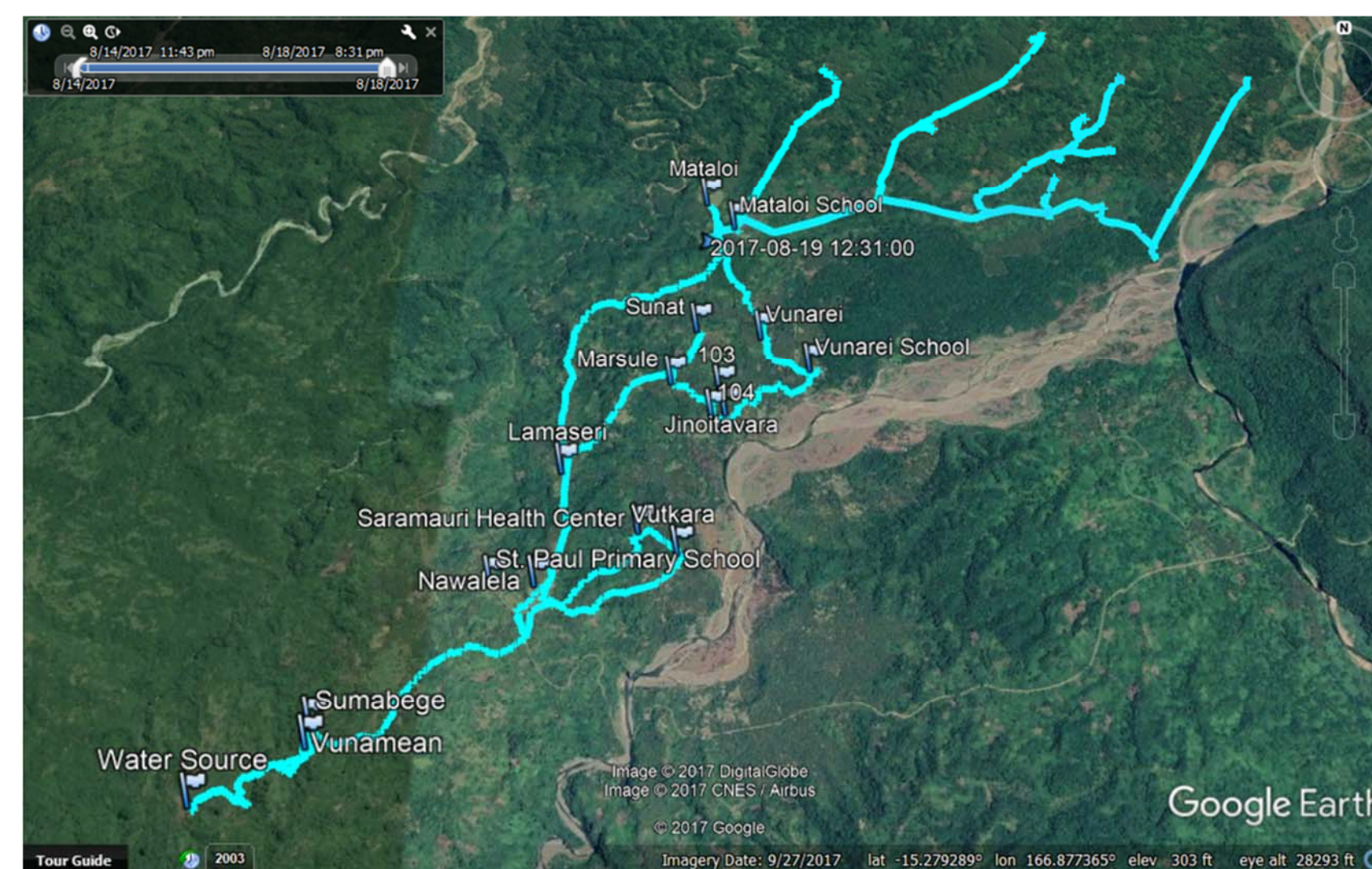
- An intake structure was researched to determine the best way to capture all of the water from the groundwater spring



([http://www.engr.psu.edu/ce/hydro/hill/teaching/rural\\_water/rws1p4.pdf](http://www.engr.psu.edu/ce/hydro/hill/teaching/rural_water/rws1p4.pdf))

### 2. Piping

- Our system will be using High Density Polyethylene (HDPE) piping material
- Based on the layout of our system, the total pipe length needed for the system is approximately 16 miles.



### 3. Elevations & Pressure Calculations

- Elevation data was used to make sure the water flowed downhill and eliminate negative pressure
- The elevation data was used in an Excel Model and EPANET to determine the pressure along the length of the system

## Project Impact

In line with the Collaboratory's vision to increase hope and transform lives through education, collaboration, innovation, and service, the Gravity Fed Water project hopes to impact the lives of the villagers of Lombok through three different ways:

- Reduce the amount of time needed to complete simple tasks so that they can use that time for more productive activities such as educating their children, learning new skills or earning money to support their families.
- Showing love to our brothers and sisters in Vanuatu through the excellent practice of engineering skill.
- Serve 30 different villages and 1300 people in Espiritu Santo, Vanuatu



## Acknowledgements

### Project members:

Jamar Gittens  
Nathan Hardman  
Kurtis Platteel  
Ella Sobek  
Shung Yen Tan (Student Project Manager)

### Advisor:

Dr. Thomas Soerens

### Partner:

Tim Johnston &  
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*Unless the Lord builds the house, those who build it labor in vain.*

*Psalms 127:1*

