

## Geographical Observations and Rock Collection

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### Abstract

*This study depicts the rock collection, pH level of the water, and geographical observation of the Sapang Balen River in Mabalacat City. The gathered rocks have been tentatively recognized as ingenious rock found in volcanoes. Sapang Balen flowing water has a pH of 7. Microorganisms were discovered in the water sample of the river. It was also noted to be rich in plants and biodiversity of many organisms such as fauna and flora.*

*Keywords: Geographical observation, water pH 7, Rock collection*

### Objectives:

1. Collect and identify rock samples taken from *Sapang Balen*.
2. Observe and describe the area through sensory observation and physical data and measurements.
3. Identify possible factors for pH level of *Sapang Balen* water.

### 1. Introduction

In the recent years change is inevitable so does change in our river the *Mabalacat City Sapang Balen river* has many wastes, algae, bad odor and some people used it as settlement leading to degradation of the river however it is still rich of organisms living in the river in hopes of it being restored, IAS embarked to survey and identify the environment to conserve our river, launching of "ISIP River Restoration". This ISIP River Restoration project have started on July 26, 2023, to exemplify the college's and institute's commitment to the restoration and preservation of critical freshwater ecosystems. The IAS team recognizes the significance of taking action and implementing long-term solutions to revitalize *Sapang Balen* in light of the decline of streams and the habitats that accompany them. The project emphasizes the need of both scientific study and real-world application in protecting and restoring freshwater ecosystems, which are

critical to biodiversity and support numerous communities (IAS, 2023).

According to Marilyn S. Arcilla 2023, *Sapang Balen of Mabalacat City*, runs through several barangays in Mabalacat City, Pampanga, and is referred to as the Mabalacat River. It occupies over 485.20 acres of the city's territory and is positioned between the Sacobia and Quitangil rivers. This river flows from Mt. Pinatubo and is an aspect of Pampanga River Basin, comprising one of the eight main river basins in the Philippines in accordance to this Five of the sixteen factors in the water quality evaluation for Sapang Balen, as reported in the report for 2018 by the DOTr and quoted by Nuguid (2021), did not fulfill the requirements of the DENR Class C recommendations for Fresh water. (Marilyn, 2023).

The biodiversity and rock formation of *Sapang Balen River's* characteristics of rocks have a significant impact on how landscapes



change throughout time. The accessibility of water at the surface of the planet, as well as which nutrients reach an ecosystem and the pH levels of the soil that forms on top, are largely determined by the mineral makeup and texture of a rock. According to Dr. Richard Ott, he has linked international data sets to look into the impact of the rock type. He made use of, among other things, species diversity maps produced by biologists and landscape information gathered from satellite pictures. According to Dr. Richard Ott, regions with rocks like granite or claystone that weather to clay during the creation of the soil and, as a result, retain water more effectively, typically have lush flora and a high species variety (Ott, 2020).

Large reservoirs tear up streams and habitats, separating species, limiting the transfer of nutrients among ecosystems, and obstructing migration pathways. The degraded river can cause harm to the migration of other organisms, there were many fish species breed throughout the world, and restrict water and sediment flows towards habitat upstream. Furthermore, ecosystems are more susceptible to dangers like climate change as a result of dams (International Rivers, 2021).

## 2. Materials and Methods

### 2.1. Geographical Observation

The study was observational, wherein the material we used to measure the depth of the river was a secchi disk, while the meter stick was in width. In the examination of the geographical area, it includes the Google map to locate the area, the weather, the temperature using a mobile, and its condition.

### 2.2. Rocks collection

In rock collection, along with personal protective gear, the researchers searched for the different kinds of rocks that exist in aquatic and terrestrial areas through their physical appearance. In identifying the rocks, the researchers used an app to temporarily know the names and kinds of those rocks.

### 2.3. Sample Collection

The researchers also collected samples of water and soil in the river that have been tested in the laboratory using a microscope and other materials such as slides, cover slips, and a pipette. The water sample was also examined for acidity or baseness through pH strips. This method will find a significant relationship between the environment, the rocks, and the organisms present in that area.

## 3. Results and Discussion

In terms of general geographic observation, the area which was the *Sapang Balen* was full of trash but the fauna and flora of the area was still very rich, the flora were diverse some only knee high and some higher than a meter and the growth were gratifying and compact with no space in between it was especially rich beside the water as when walking the feet can be caught by the flora that have fallen in the water and entangled. In terms of the organisms living in the community of the river, the fauna was also diverse as we observed a number of dragonflies and damselflies which were bio indicators of the quality of the water as well as its health (Seidel, 2019). The researchers have observed fishes, insects such as lady bugs, spiders, and mantis residing in the flora near the water and mollusk, millipede and centipedes, bees and butterflies and ants for among the organisms observed in land.



Figure 1. *Sapang Balen*

The water was clear but the flow was



fast this may be due to the fact that the previous night before the activity it rained and during the activity the weather was both drizzling and sunny, it was also cold with the temperature of 24°C , it may also be due to this that the water was deeper than expected as the depth was 1 to 2 ft and the width was 14 ft to 16 ft, the difference in measurement was due to the fact that some area in the water was narrower and some more shallow but as the researchers walked farther the deeper the water also becomes, estimated that starting from 100 meters away the depth of the becomes deeper reaching above the thigh and the distance between the bridge where we began and next bridge were roughly 0.37 km above.

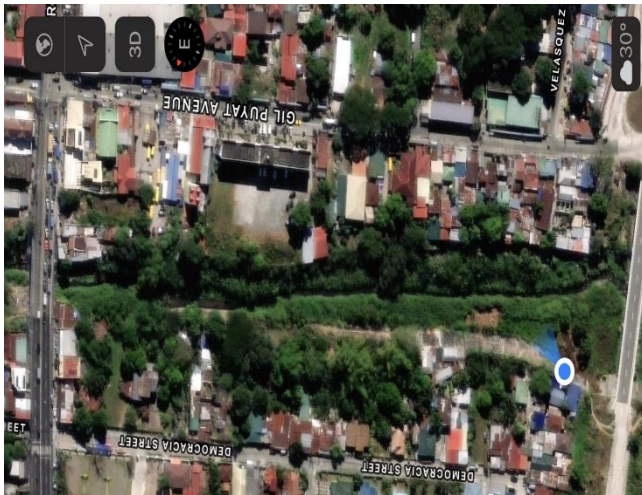


Figure 2. Sapang Balen in Google map

In terms of odor, it may be due to that the river was near human settlement and infrastructure that the smell was particularly unpleasant as residents near the area may have used the river to throw trash in and it may also be due that because it rained the previous day before the pollutants and other chemicals were also carried in the water as it flows in the water causing the unpleasant odor (US EPA, 2023). The terrain in the water was a little harsh with rocks of varying sizes in the water which makes it a little harder to identify which area is deeper and which was shallower when walking. As a part of our geographical observation, the researchers have also gathered three samples to aid with the observation, the soil, water and rocks sample taken from both land and water.

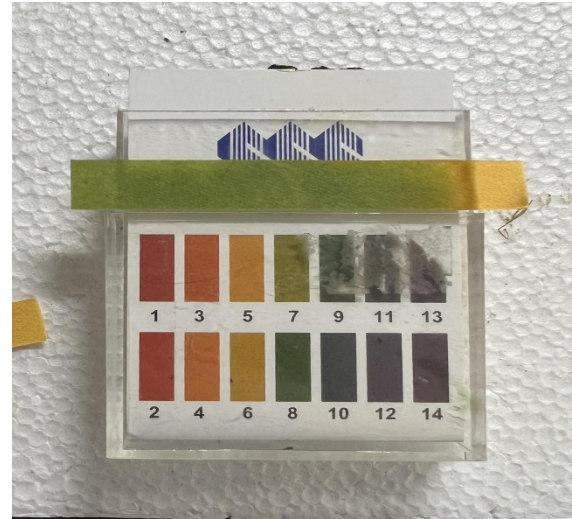


Figure 3. Water Sample pH test



Figure 4. Comparison of Water from river and Distilled water

The pH test for the water sample that was taken was at the neutral pH level of 7 (see figure 3) while the pH level of the distilled water was only at pH level of 6 (see figure 4). In this aspect, various factors may be applicable for the pH level of the *Sapang Balen River*, among them are the pollutants that may flow in it and the pollutants that were absorbed by the soil (Mohamed et al., 2018). Another reason may be due to the presence of microalgae the researchers have observed under the microscope as *Chlamydomonas*, as most microalgae grow in a neutral pH and these particular microalgae optimum growth is between the pH of 5.5 and 8.5 (Yu et al., 2022). Another aspect that can be considered would be the relationship of Carbon dioxide and pH as when CO<sub>2</sub> was absorbed and processed into



carbohydrates molecules such as glucose and for cell growth during the day the pH level of the water rises, and it decreases when CO<sub>2</sub> is released in the water (Ashley, 2022).

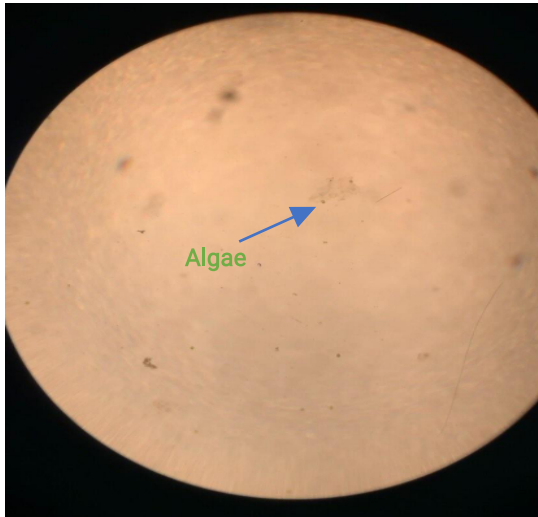


Figure 5. Water sample under microscope

The soil sample when viewed under the microscope showed a microorganism that was planaria like surrounded by *Chlamydomonas*, the organism may have hidden in the sand due to the disturbance when walking in the water. The soil was sandy in the water but more compact and moister in the land surrounding it, which may have helped in the growth of the flora. The preliminary observation and identification of the rock samples the researchers have collected from both land and water showed that most of them are basalt which were igneous rocks that were dark, smooth and fine grained (King, n.d.), some of them showed that they were pumice which were igneous rocks that have rough foam like texture, usually light colored and is form when a volcano explodes and cools rapidly when coming in contact with water (Mat, 2023) the last type observed was a sedimentary rock such as sandstone and limestone which are more common in bodies of waters such as rivers (U.S. Geological Survey, 2012).

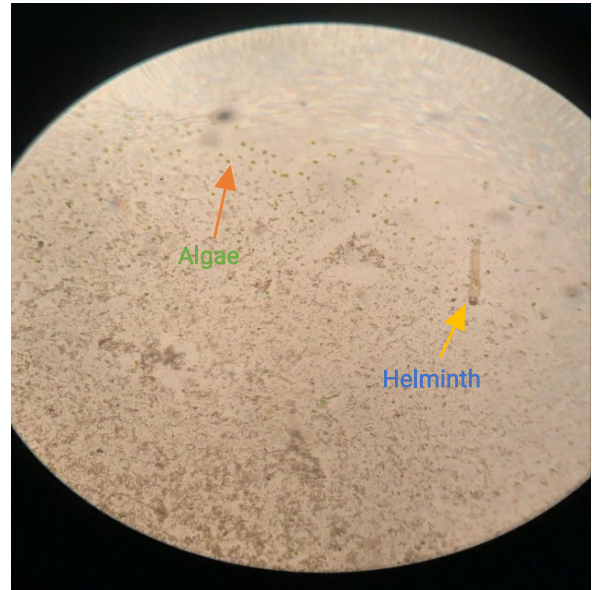


Figure 6. Soil sample under microscope

As preliminary identification of the rocks the researchers found showed that most of them were igneous rocks, it may imply that the river may be connected to a volcano or upon explosion of a nearby volcano some particles were mixed with the water which may have formed the rocks and brought them to different area following the flow of the water and the rain.



Figure 7. Rocks Samples from *Sapang Balen*

#### 4. Conclusion



Based on the data, it shows that the *Sapang Balen* water has a pH of 7, and other factors may have contributed to its being neutral. The river has lots of trash and overgrown trees. In terms of rocks, most of them are igneous. A lot of organisms had been collected such as fauna and flora, and as we gathered all the data, the Researcher's came to the conclusion that those organisms may have adopted, grown in, and reproduced in that kind of environment as they lived along with the water and rocks present in that area.

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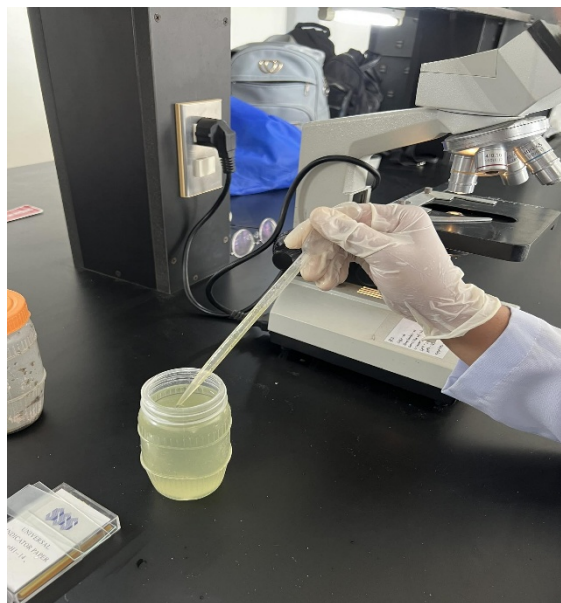
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## Documentation





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