**III. DATA ACQUISITION**

This is accomplished in following ways.

1. **Onsite Measurenment:**

The process of on-site measurement starts with an independent buoy that has essential sensors and a camera installed, which is deployed in a lake to gather information on different water quality factors which are pH, turbidity, Total Dissolved Solids (TDS), temperature, and capture images of the underwater environment. The buoy's movement is tracked using GPS, and all the water quality related data is sent back in real-time to the cloud via a communication module for monitoring purposes.

Onsite measured data will be utilized to forecast water quality parameters, while the captured images will undergo image processing to monitor the water quality.

1. **Remote Sensing:**

Chlorophyll-a and turbidity, two indicators of water quality, are measured using remote sensing technology.

Using remote sensing technology is an effective way to monitor the water quality of multiple lakes at the same time. With the Sentinel-2 satellite, we can perform reliable analysis of the water quality of several lakes simultaneously. Sentinel-2 is a high-resolution, multi-spectral imaging mission that covers a wide area, making it ideal for studying land cover, vegetation, and water quality, including inland waterways and coastal regions. To implement this in our project, we have chosen to use the Google Earth Engine (GEE) as our monitoring platform via the Sentinel-2 satellite.

1. **Historical Water Quality Data:**

Comparing current and future water quality data with historical records serves as a reference point. Past monitoring programs and databases are the sources of such data, which can help detect patterns in water quality changes over time. Moreover, historical information can aid in creating statistical models that predict water quality variations under various conditions.