PHASE 1:WATER QUALITY ANALYSIS

# PROBLEM STATEMENT :

The problem at hand is to advance the field of water quality analysis by harnessing the capabilities of artificial intelligence (AI) and machine learning (ML). This project aims to address the following challenges:

* Data Quality Assurance
* Predictive Modeling
* Anomaly Detection
* Spatial Analysis

PROBLEM DEFINITION:

The most frequent water quality issue is due to the high content of iron (iron(III) oxide) and magnesium content in raw water of treated water. Water quality disorders occur as a result of changes in the color of the water that turns yellow to a dark brown color. The color change is due to action chemical reactions that are used in the water treatment process at the Treatment Plant (Kasan, 2006). This water treatment diagnostic and auditing process still uses manual methods, where water will be measured and the quality index will be clinically measured inside the laboratory. Besides, low pH levels cause fish killed by stressing animals system and causing physical damage, which in turn makes them more vulnerable to disease.

DESIGN THINKING:

* ANALYSIS OBJECTIVES:

The objective of water quality analysis is to assess and ensure the safety of water for human consumption and ecosystem health by examining parameters such as contaminants, chemical composition, and microbial content.

* DATA COLLECTION:

We will obtain our dataset from Kaggle.This dataset will include essential features such as PH,hardness,solids,chloramines,sulfate,

Conductivity,organic carbon,turbidity and potability.Having access to

Real-world data will be essential for training a predictive model.

* KAGGLE DATASET LINK:

<https://www.kaggle.com/datasets/adityakadiwal/water-potability>

* TOOLS/MODULES:

Pandas, NumPy, and Scikit-Learn will be used for data preprocessing and initial analysis.

* VISUALIZATION STRATERGY:

In the realm of water quality analysis, employing machine learning (ML) tools for visualization is a powerful strategy. Utilizing charts, graphs, and maps to represent data trends and3D visualizations for spatial analysis of water quality parametersThe content could be structured

* PREDICTIVE MODELLING:

Decide on the machine learning algorithms and features to use for predicting water potability