

# Water Quality Prediction AI Project Report

## Section: SDG Alignment & Ethical Considerations

### SDG 3 - Good Health and Well-being

Unsafe drinking water contributes to numerous diseases, particularly in vulnerable communities.

This AI-powered tool supports early detection of unsafe water, empowering public health workers, municipalities, and citizens to take preventative measures that reduce disease outbreaks and health risks.

Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

### SDG 6 - Clean Water and Sanitation

The project supports improved access to clean water by enabling users to determine water potability using measurable physicochemical features.

The tool serves as a low-cost, data-driven screening mechanism that can be used in areas lacking formal lab infrastructure.

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

## Ethical AI and Sustainability Considerations

### 1. Bias Mitigation

- The dataset was checked for missing values, and the model was trained using balanced data

processing.

- The prediction is based on quantifiable chemical properties, avoiding human or demographic bias.

## 2. Accessibility & Inclusion

- The tool can be accessed via a low-bandwidth Streamlit app, supporting deployment even in areas with limited internet.
- The app uses simple language and numeric inputs, making it usable by non-experts, health workers, or school communities.

## 3. Environmental Considerations

- The model uses a lightweight Random Forest Classifier, minimizing compute resources compared to more energy-intensive AI models.
- Deployment via cloud or local devices allows for eco-conscious implementation in schools, health clinics, or mobile labs.

## 4. Responsible Deployment

- The app clearly communicates that it is a predictive tool, not a substitute for certified lab testing.
- Results are shown with intuitive labels ([Yes] or [No]), reducing risk of misinterpretation.

## Measuring Impact

- Accuracy and precision of the model will be monitored as more data becomes available.
- User feedback can be incorporated into updates, improving community engagement and iterative development.
- Educational use in schools and universities can increase awareness about water safety and responsible AI use.