Tanzania Water wells Prediction

Identifying and Addressing Water Well Issues in Tanzania

Project Overview

Tanzania is facing challenges with its water supply, particularly maintaining the functionality of existing water wells.

Goal : Our goal is to help predict the condition of water wells using various factors such as the type of pump, installation year, and other key attributes. This can assist NGOs and the Tanzanian government in making data-driven decisions about well repairs and planning.

Problem Statement

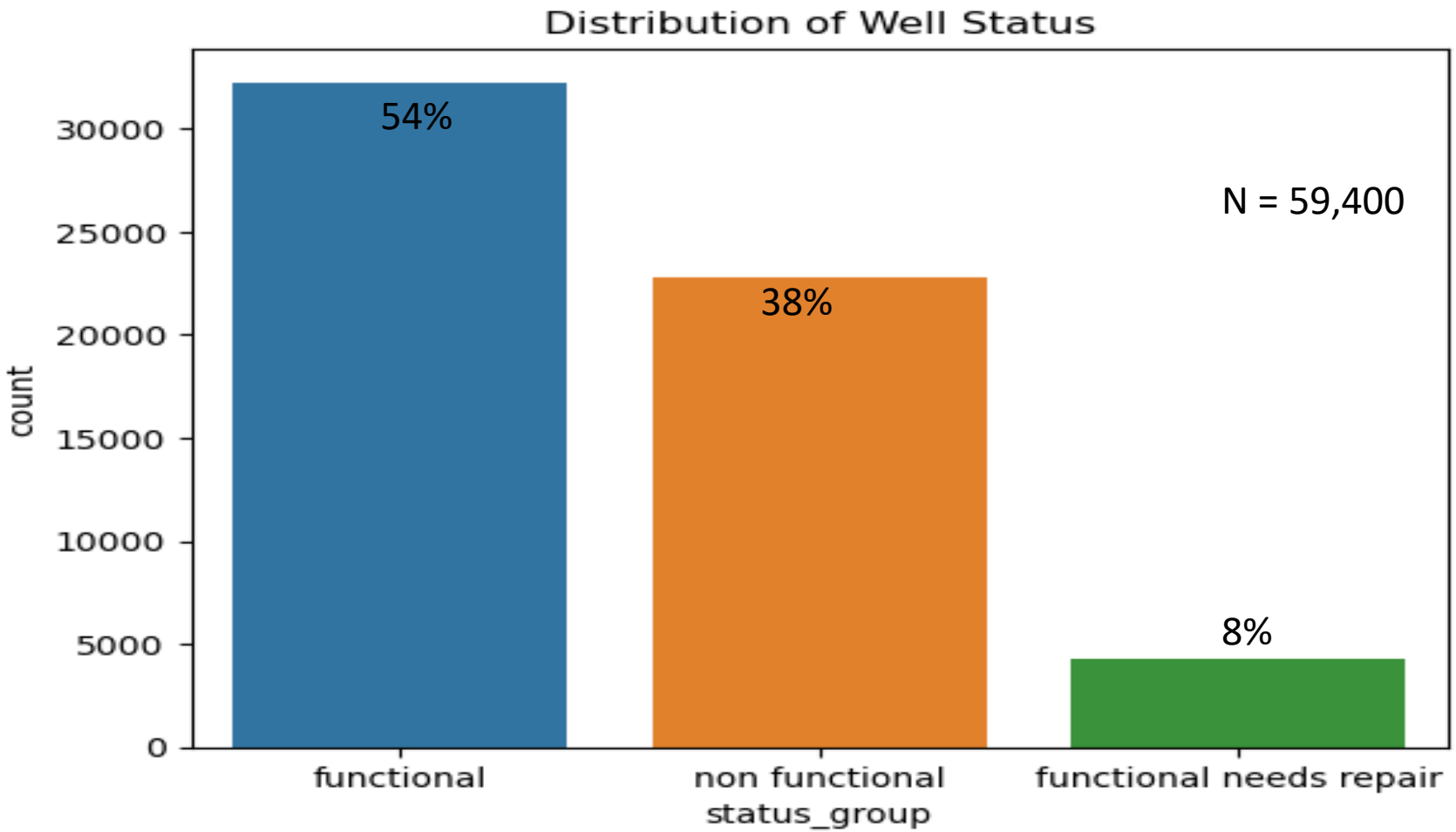
Challenge: Many water wells across Tanzania are not functioning as they should. This leads to issues with access to clean water, especially in rural areas.

Solution: We built a model that predicts whether a well is functional, functional but needs repair, or non-functional, helping prioritize resources.

Business Understanding

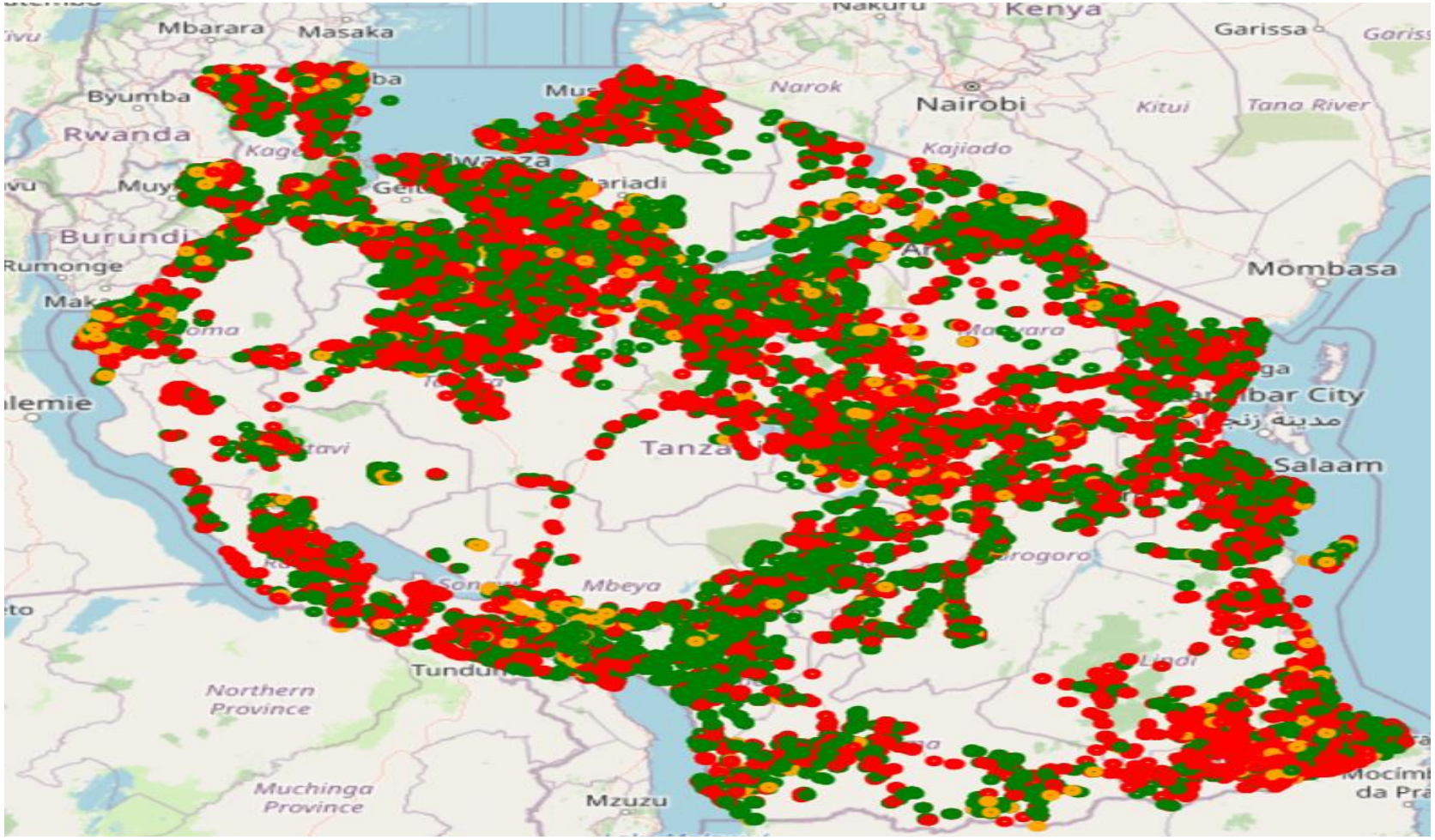
- **Relevance** : Water is essential for health, agriculture, and daily life. Efficiently managing the water infrastructure is critical for improving access to clean water.
- **Target Audience**: NGOs, Government bodies, and policymakers can use this information to plan repairs, allocate resources, and strategize new well installations.

Data Understanding



Data source : https://taarifa.org/

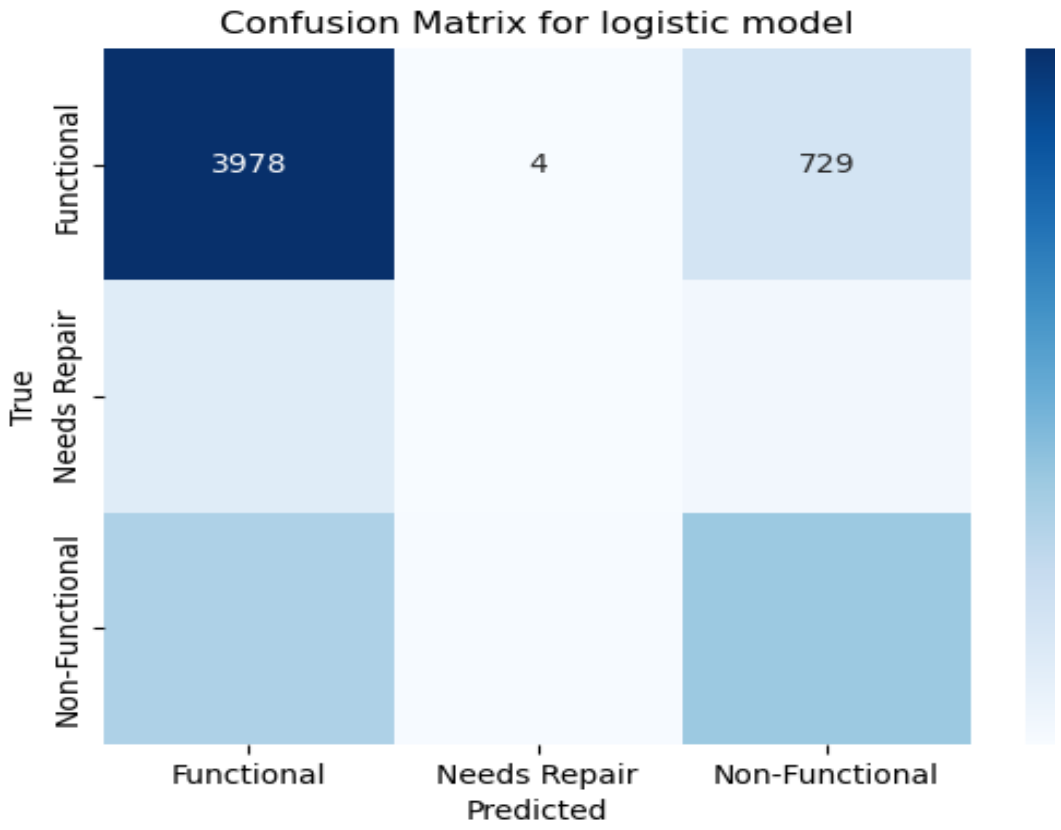
Data Visualization



A map of Tanzania shows where wells are located and their current status.

Model Selection

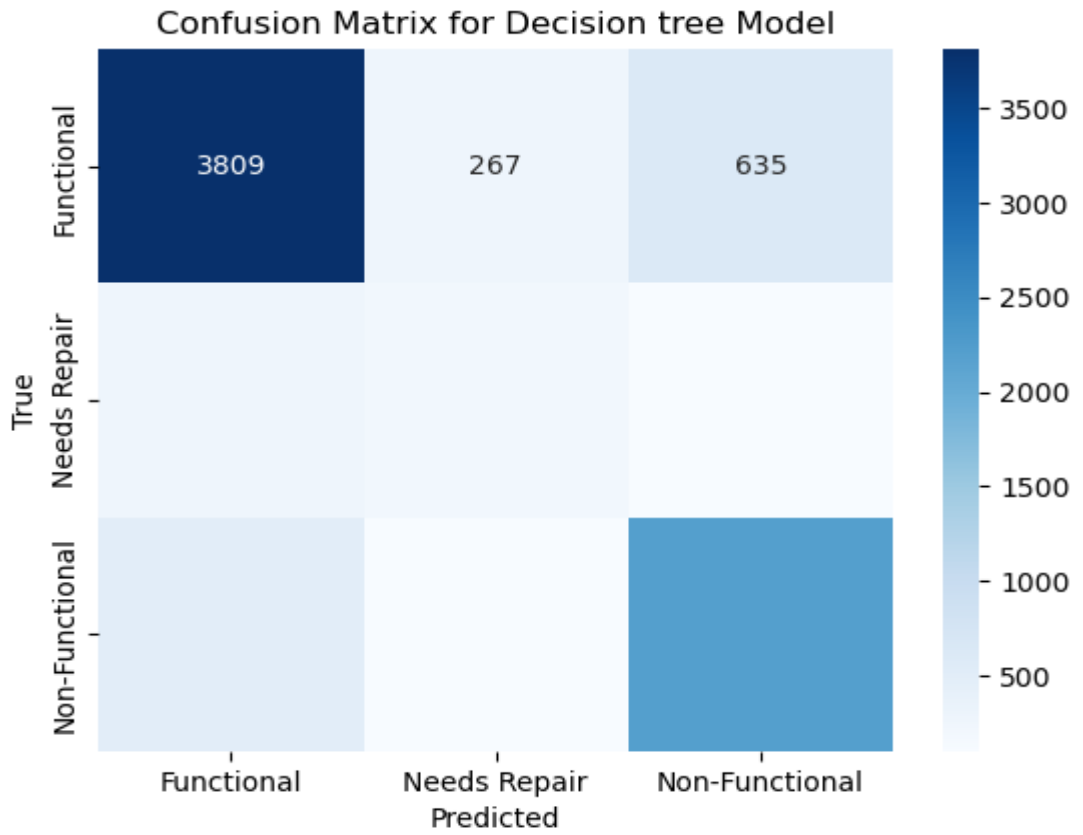
Logistic Model



Model accuracy : 67%

Precision – 0.6413
Recall – 0.6743
F1 –Score –0.6435

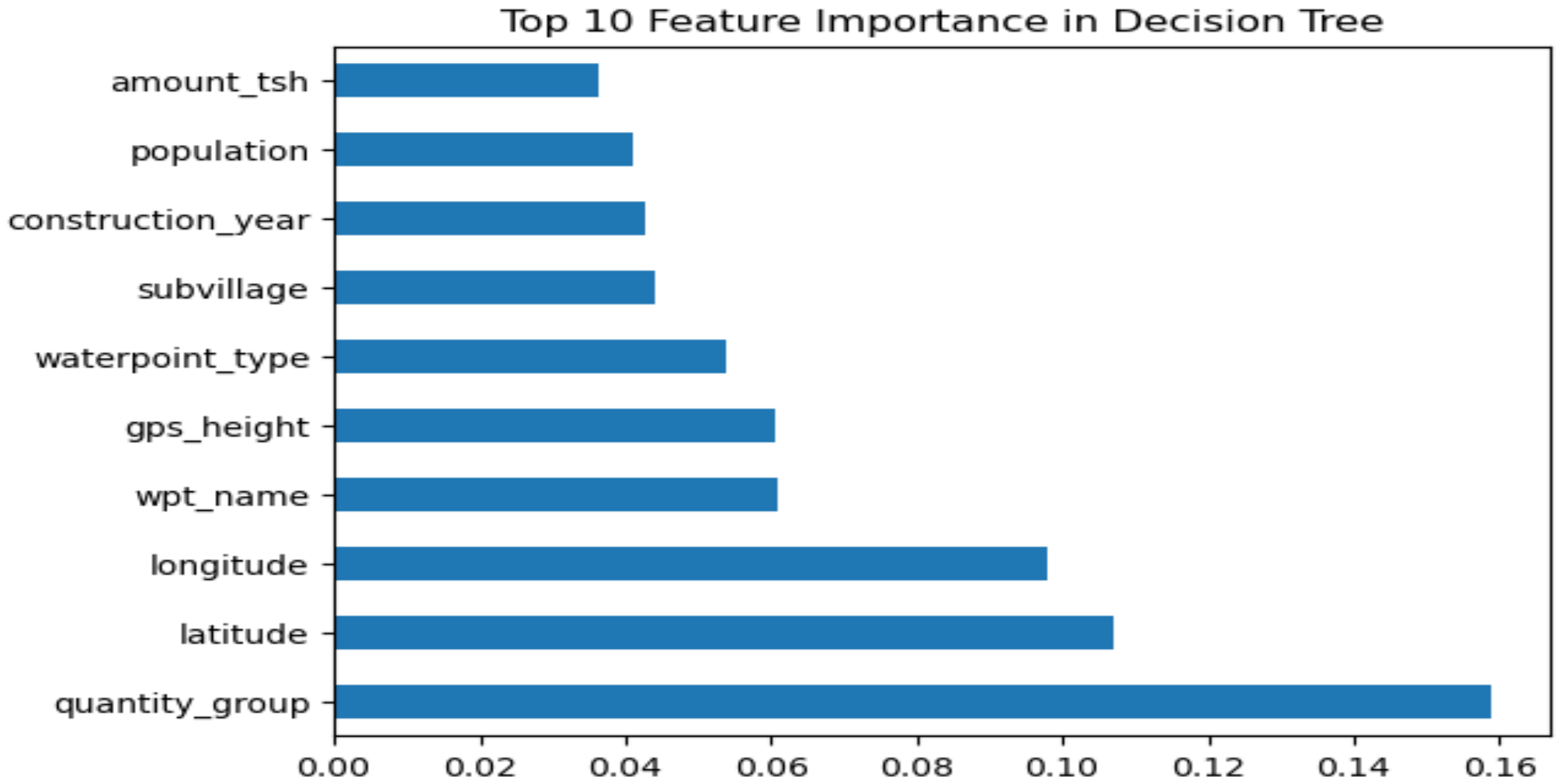
Decision Tree



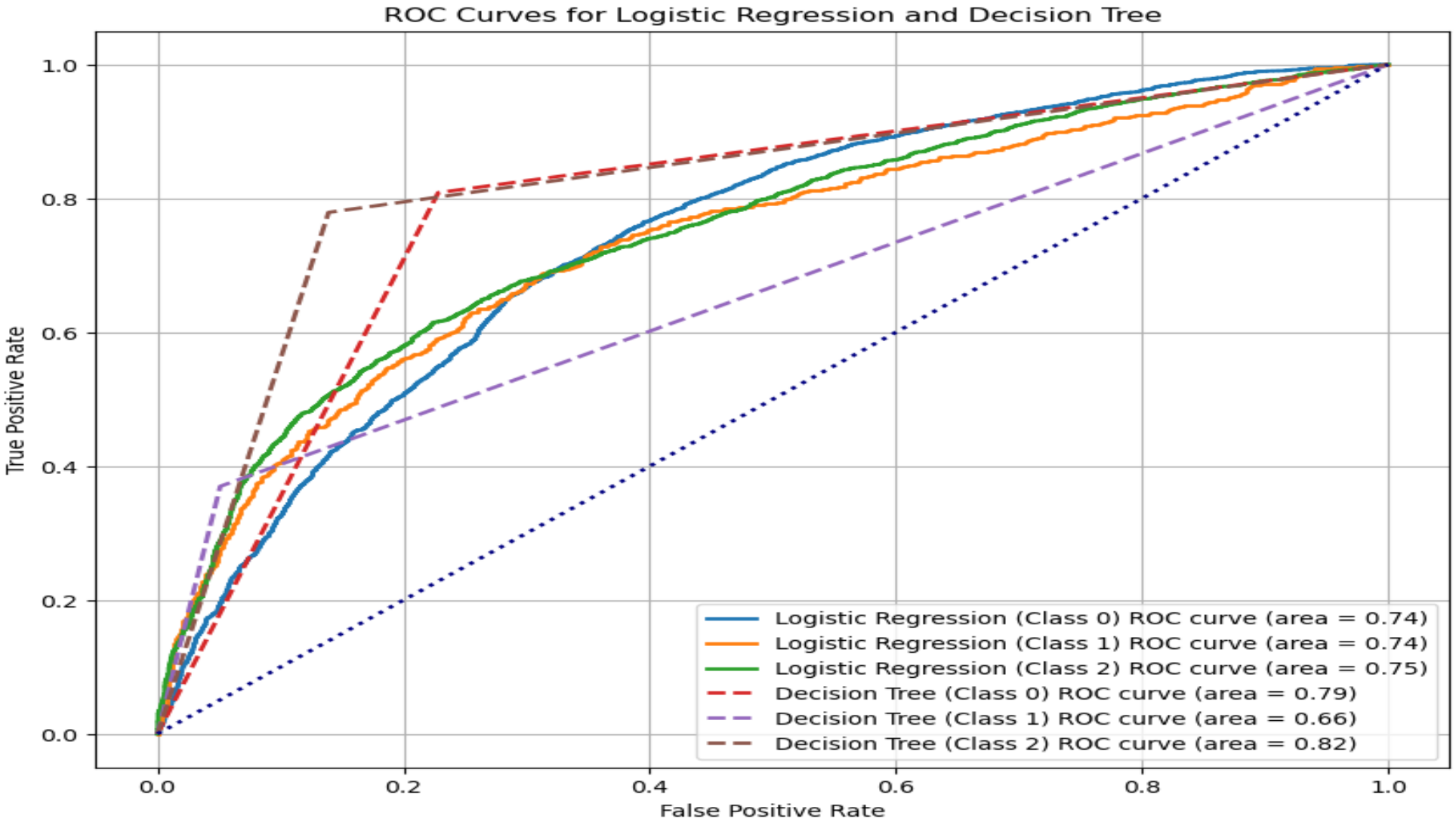
Model accuracy : 77%

Precision – 0.7672
Recall – 0.7658
F1- Score – 0.7663

Feature importance in Decision Tree



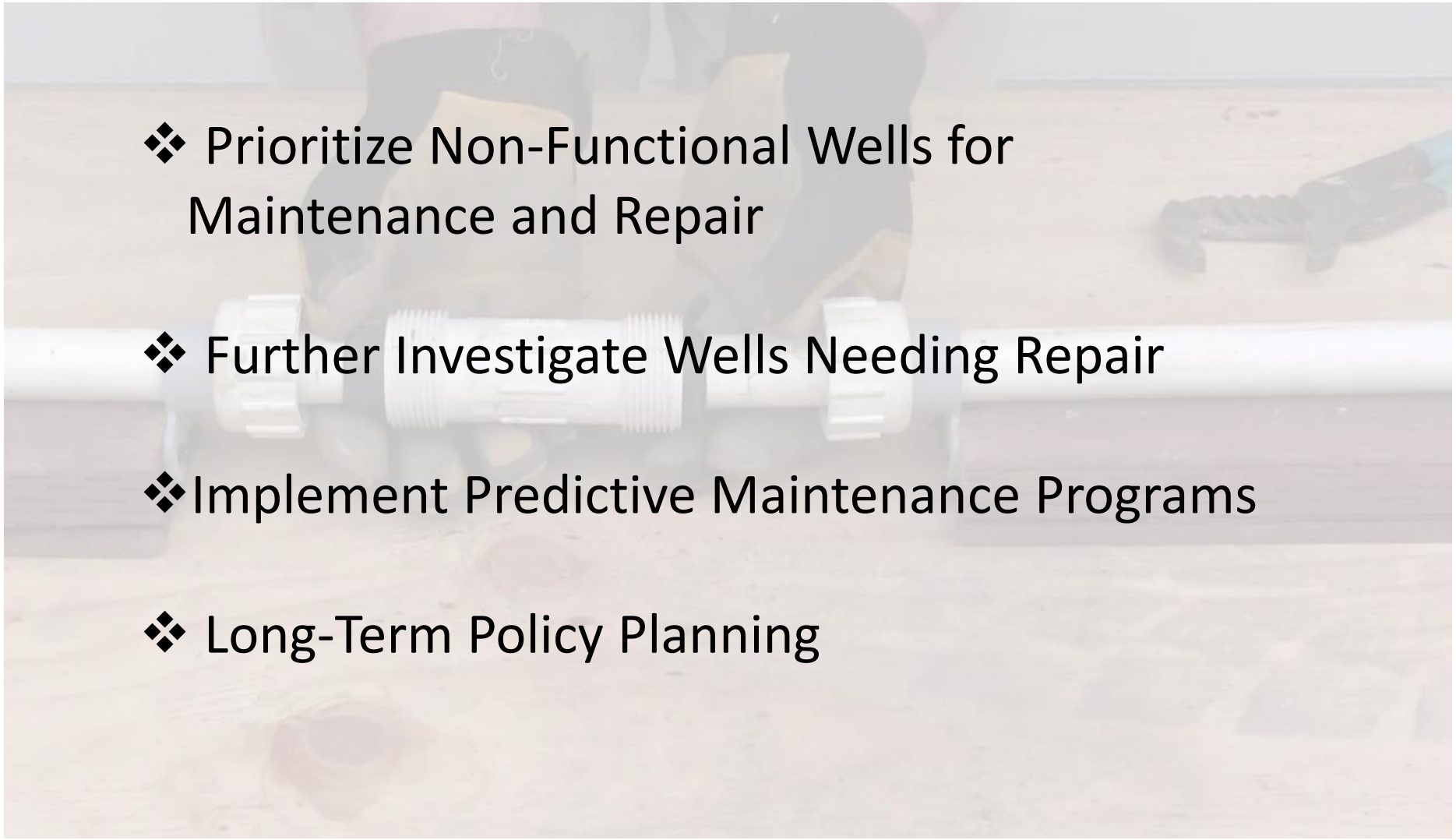
Evaluating Model Performance with ROC Curves



Limitations

- The data might be imbalanced, which could affect the performance of the classifier.
- Missing values were imputed, which might have introduced bias into the model.
- Some important features are missing, such as real-time sensor data or seasonal information.

Recommendations



- Prioritize Non-Functional Wells for Maintenance and Repair
- Further Investigate Wells Needing Repair
- Implement Predictive Maintenance Programs
- Long-Term Policy Planning

Thank YOU!

Any Question?