

A photograph of a traditional wooden water well pump. The pump is made of dark wood and features a long, curved wooden beam with metal bands. A metal bucket hangs from a pulley system attached to the beam. The pump is situated on a circular stone platform. In the background, there is a green field, a white fence, and a cloudy sky.

# Tanzania water wells

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# Introduction

- Tanzania Is known to have a major challenge of providing clean water to its people.
- It has several water points but most seem to be non-functional while others still functional.
- Lack of efficient well functionality poses a challenge to the country when trying to provide adequate water to its population.

# Project objective

- 1. To identify which payment methods best contribute to maintenance of the wells
- 2. To distinguish the different factors that contribute to functionality of the wells.
- 3. To find the best classification method to analyze the dataset.

# Data

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- The analysis is based on data from Tanzanian ministry of water which includes information on the regions, altitude, source and so much more.



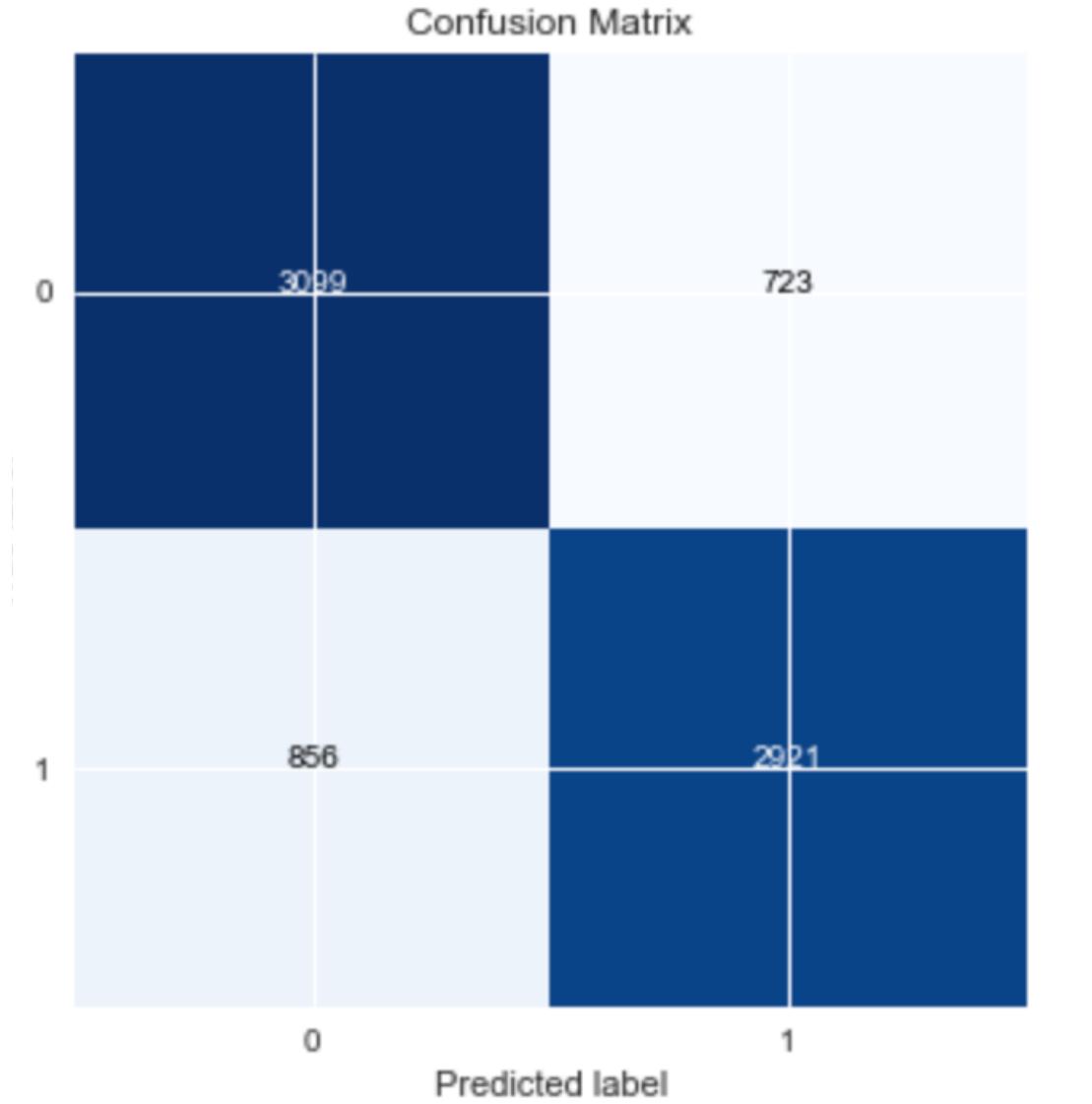
# Classification modeling

- This helps predict and understand the status of wells which guides decision making for resource allocation and maintenance strategies.
- Why classification?
- Tanzania has a challenge of providing clean water hence classification modelling helps identify factors influencing well functionality.

# Classification modeling

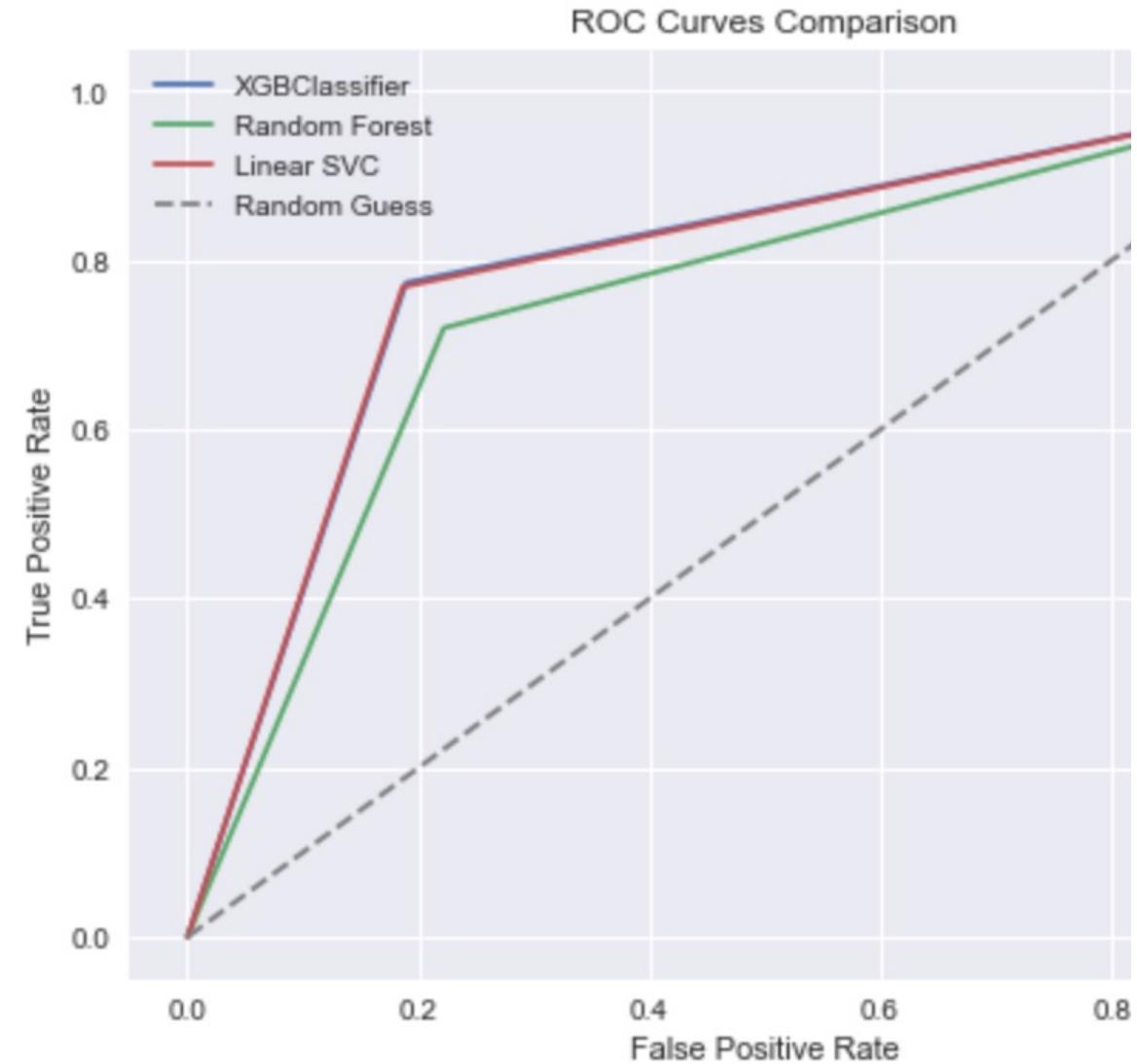
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- It helps enhance access to clean water by addressing factors affecting well functionality thus supporting government and NGO's efforts.
- By utilizing machine learning methods, we can predict the status of wells based on certain features for example in this case age and impact of public meetings.



# Model Evaluation

- The analysis reveals that XGBoost outperforms the other models used achieving the highest accuracy score of 80%.
- The precision and recall also maintained high values of 80% and 77% respectively ensuring a balance of correctly identifying between functional and non-functional wells.



# Findings

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- Payment impact: wells maintained through bucket or monthly payments exhibit better functionality highlighting the importance of structured payment systems.
- The main factors that influence functionality of wells is
- A) Age as the newer ones tend to be more functional.
- B) Ground water emphasizing the need for rainwater harvest, and soil conservation to maintain water levels.
- C) Public meetings to promote community engagement.

# Recommendations

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- Use of structured payments like monthly subscriptions.
- Community engagement.
- Sustainable practices to ensure stable water supply.



An aerial photograph of a long, straight bridge stretching across a large body of water. The bridge has two lanes in each direction and is surrounded by a metal railing. Several vehicles, including cars and trucks, are visible on the bridge. The water below is a deep teal color with small ripples.

Thank you