



Pump it Up: Tanzania Water Pump

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Agenda

Overview

Problems to Look at

Models

Findings





Overview

Potable water access is important to Tanzanians. Many areas use different types of water pump.

Can data help us to understand what's behind the operation?





Problems to solve

1

Would water characteristics affect the operation of the pump?

2

Would human associated features affect the operation of the pump?

3

Are there any geographical distribution of pumps in different functionality status?

4

Are there any particular characteristics standing out that can affect the functional status of the pump?



Graphs & Finding

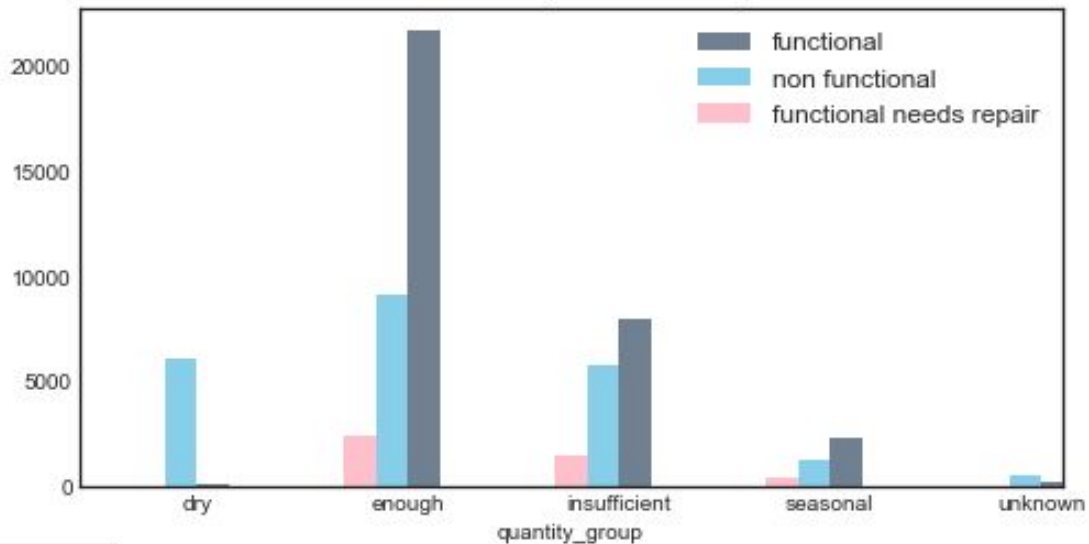
What have been spotted from the data analysis?



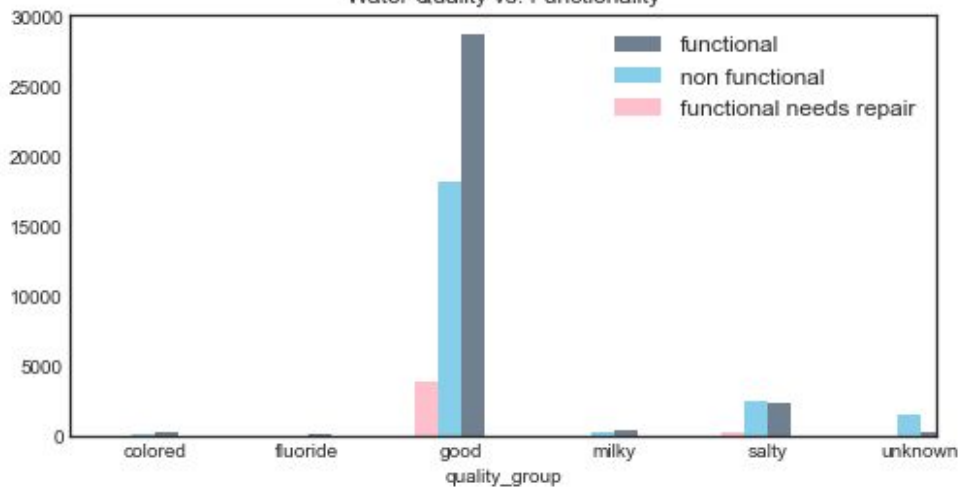
Water

Does quality and quantity affect pump operation?

Water Quantity vs. Functionality

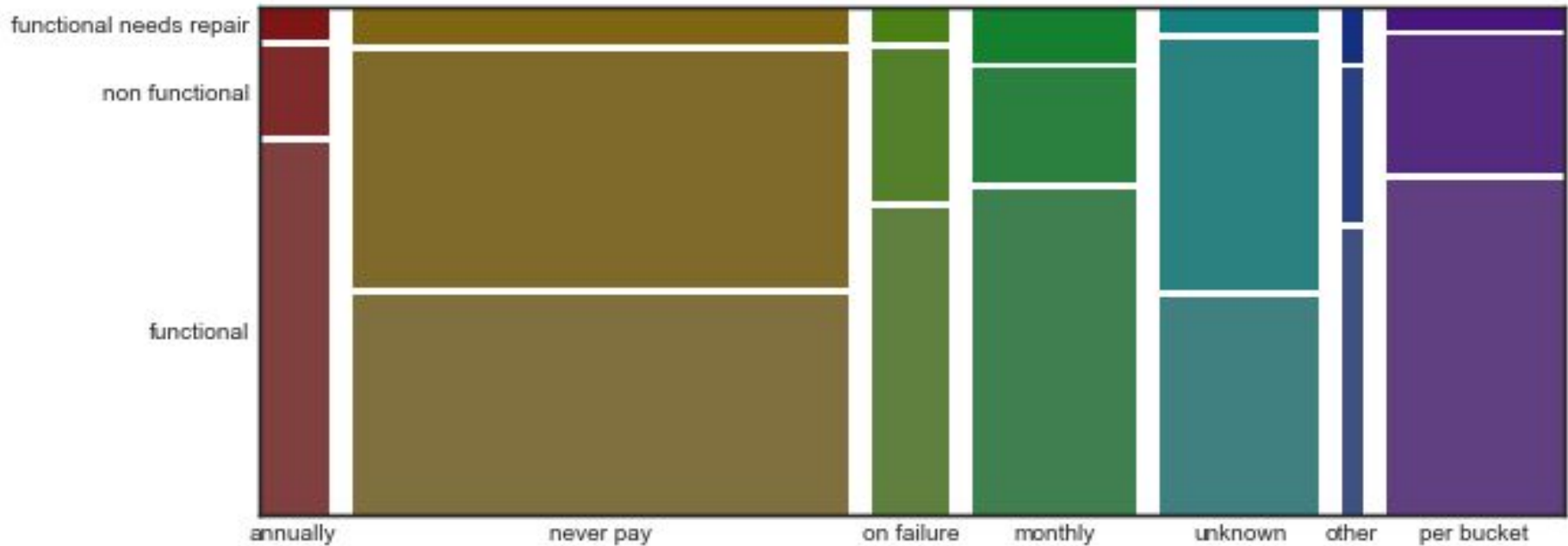


Water Quality vs. Functionality



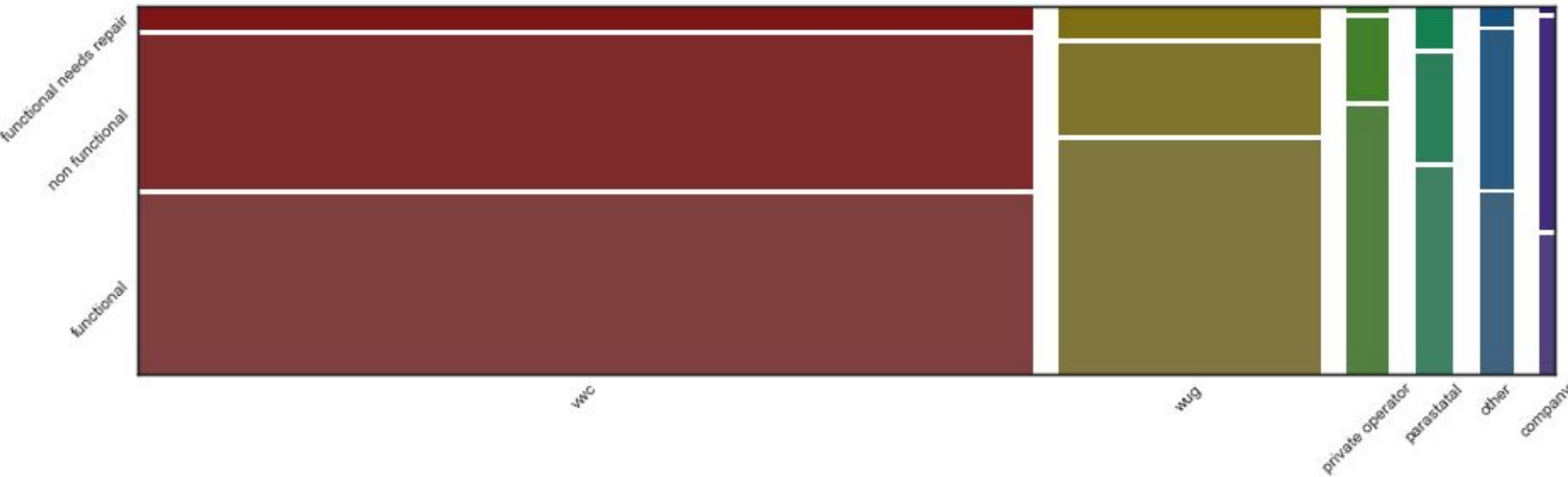


Operation: Payment vs Functionality





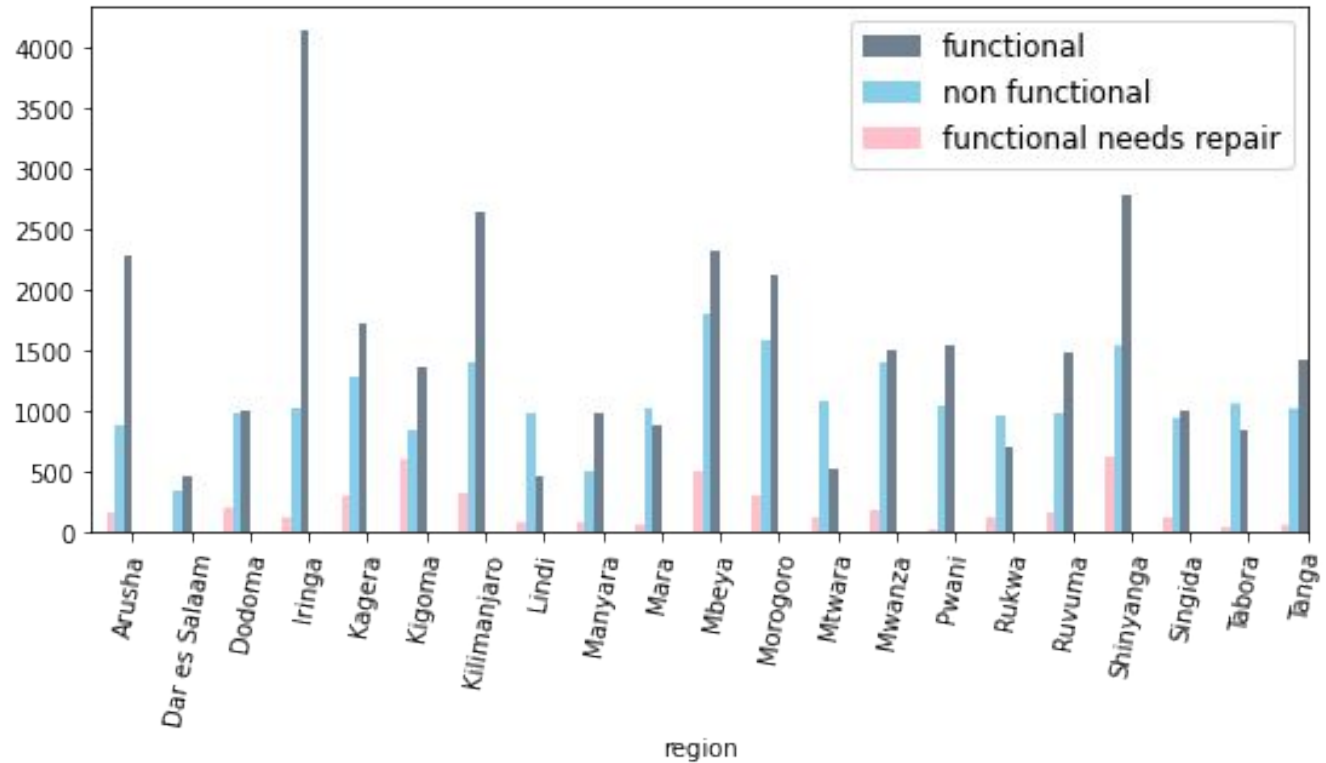
Operation: Management vs Functionality





Geospatial

Three map plots showing geographical distribution of functional groups.

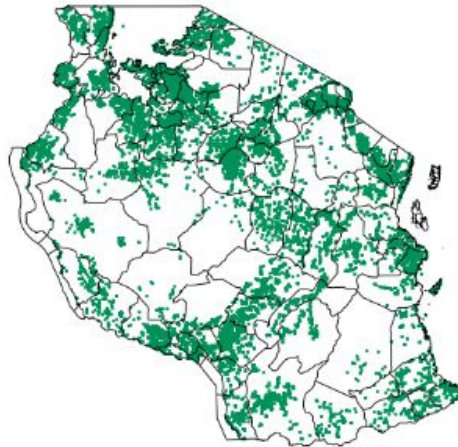




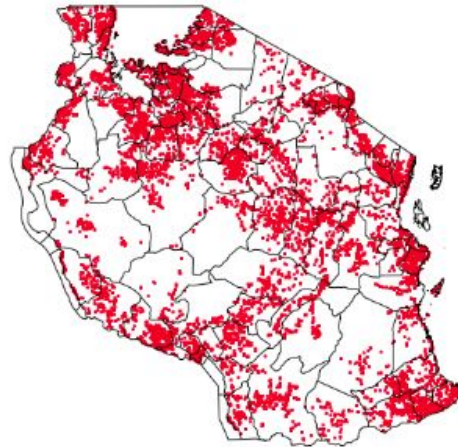
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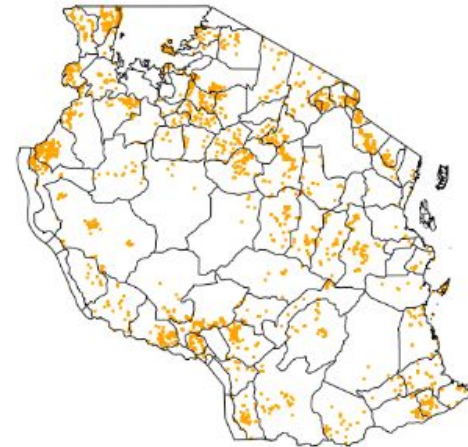
Functional Pumps



Non Functional Pumps



Functional Pumps Need Repairs





Odd Regions Out!

What makes them different?

- **Source:** Machine DBH & Shallow Well on the top
- **Extraction:** Handpump & Other taking ahead
- **Population:** Higher average than overall (by 32%)
- **Amount water available:** Average is lower than overall average (by 28%)



Models



**Random Forest
Classifier**

**K-Nearest
Neighbour**



XGBoost



Model's Accuracy



KNN: 68%



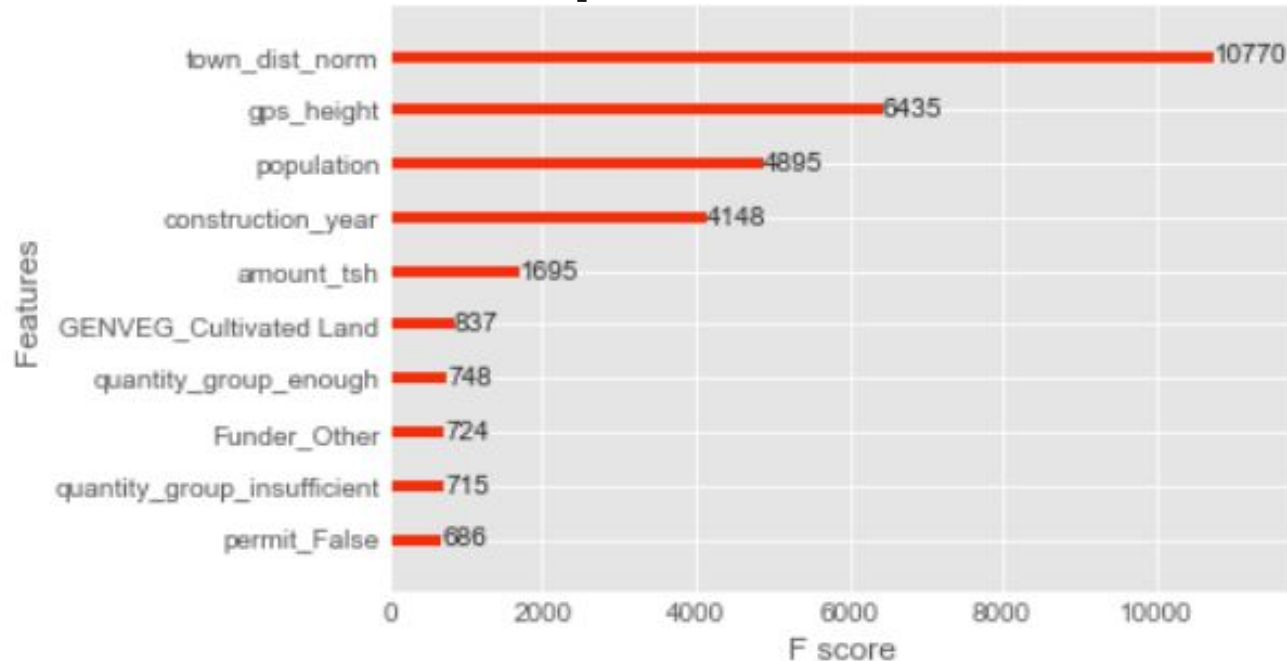
RFC: 73%



XGBoost: 79%



What variables are important?





Further Improvement Area

1

Deeper dive into the management, funding, and installing agencies

3

Predict the unknown value in quality and quantity.

2

Other economic factors to add into the study

4

User group for the pumps:
Education level & Water end use



Thank you.

Q&A?

