Tanzania Water Supply

Background

- 50% of Tanzanians don’t have access to clean drinking water
- Groundwater is generally cleaner than surface water which is polluted from sewers and toxic waste
- Sometimes people have to walk miles to closest pump and villages only have one pump

Our Approach

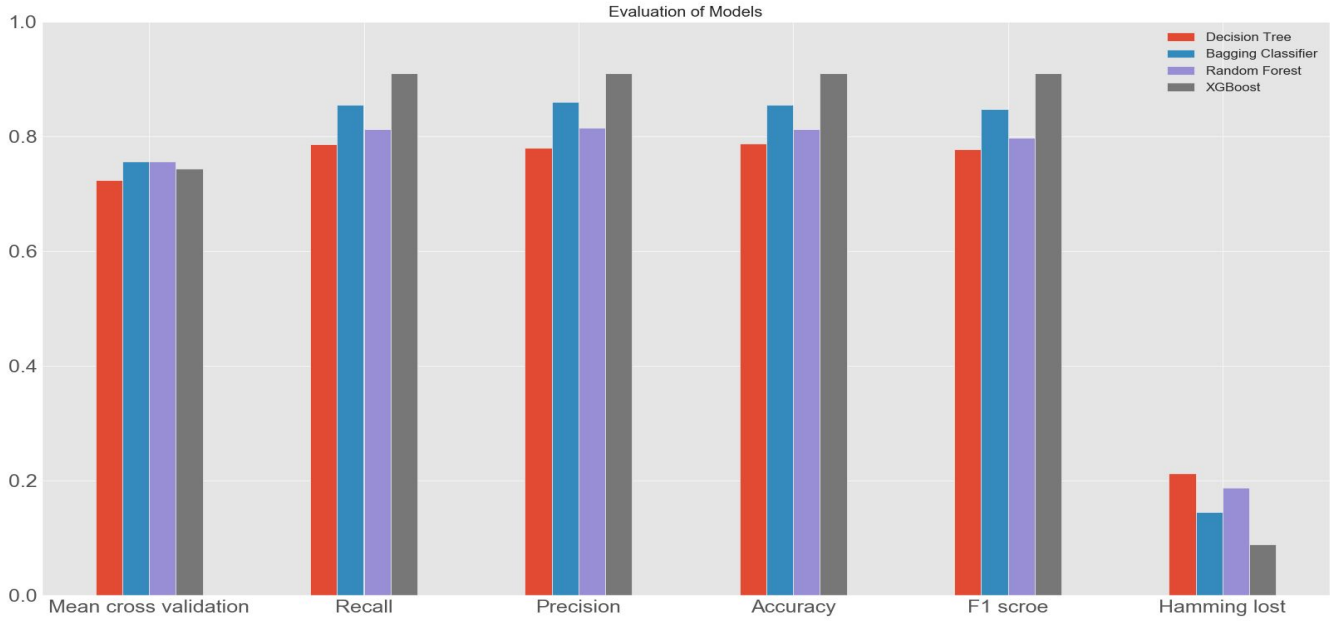
Data Cleaning

- Train data : 59400 records
  Test data : 14850 records
- Predict the condition of waterpoint: functional, non functional, and functional needs repair

- Choose features to use
  - Drop meaningless features: id, recorded_by (All by GeoData Consultants Ltd)
  - Use wider range features: larger geographic meaning features, extraction type, The quality of the water
- Adjust unreasonable values:
  - Change NaN to 'others'
  - Altitude of the well is minus
  - The year the waterpoint was constructed is zero
- Avoid overfitting: Only use top 50 values in each features, we set others as 'others'

Models

Choose bagging because it had a better cross-validation score and wasn't computationally expensive.

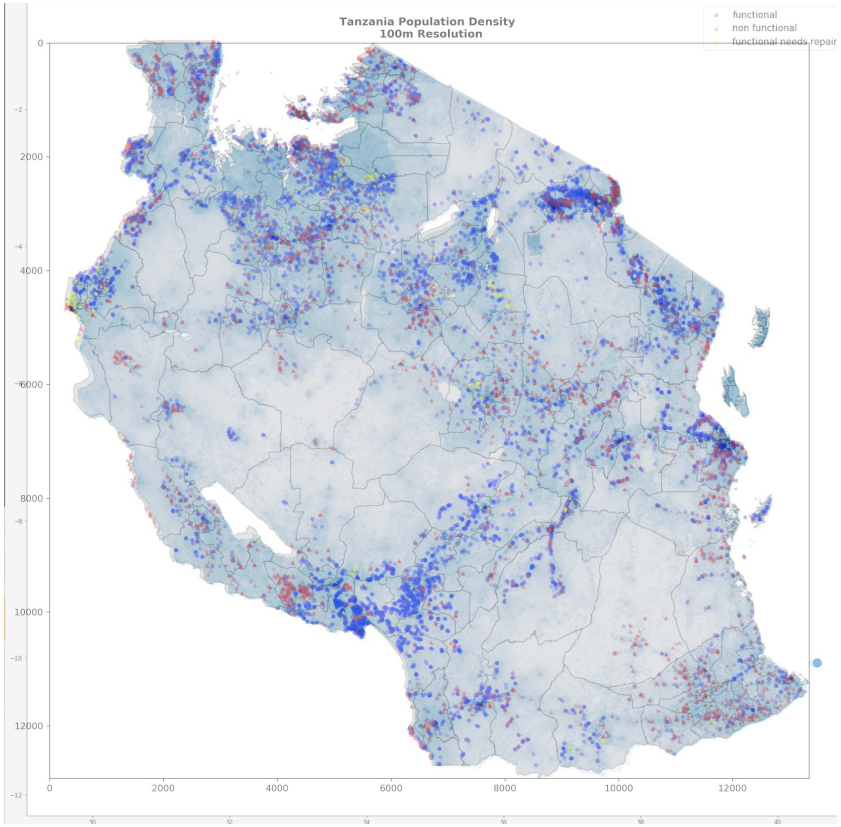


Findings

- The model predicts 64% Functional, 34% Non Functional, 2% Functional Needs Repair in the test data.

- We concluded that population and elevation to be the two main determining factors in pump functionality.
- Most broken pumps in big cities located on the coast with high population density.

Findings

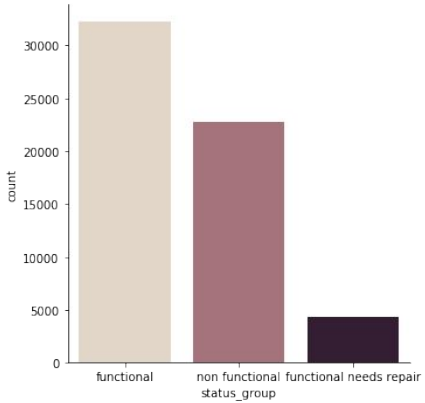

Tanzania Population Density
100m Resolution
functional
non functional
functional needs repair
0
2000
4000
6000
8000
10000
12000

Our recommendation

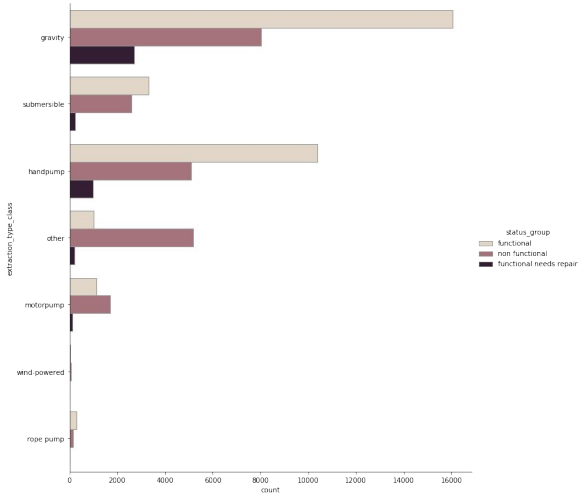
- Concentrate well repair to cities where it is likely surface water is polluted and pump functionality is imperative for clean drinking water

Next Steps:

Address Class imbalance



Better test what types of pumps/wells work better by dropping population and elevation.



Grid Search with XGBoost.