



Tanzania Water Pump Classification

Using classification models to determine water pump functionality.

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Business Overview

Problem: Predict which Tanzanian water pumps are functional, which need repairs, and which don't work at all.

Business Value: A smart understanding of which waterpoints will fail can improve maintenance operations and ensure that clean, potable water is available to communities across Tanzania. This understanding includes predictability based on location and types of pumps, for faster assessment and follow through.



Method

Tested three different algorithm models:

Ran several models to find best performance of classification.

Looked for most important features of data involved in classification.

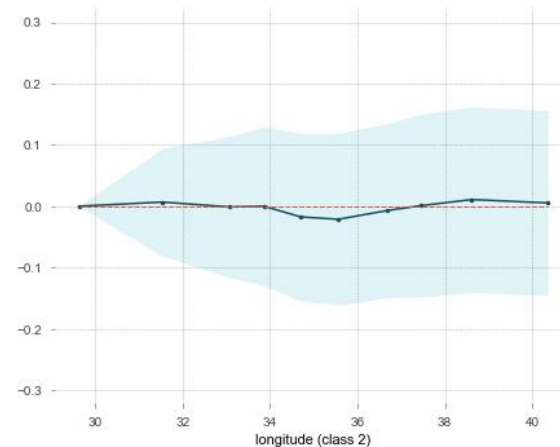
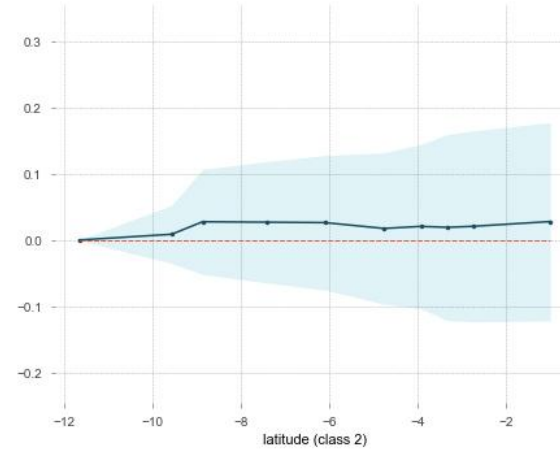
Followed up with visuals to help explain each variables effect on class.

- Focused mainly on location, population and pump technology

Prioritize geolocation for pump repair.

Nonfunctional pumps likely to be located:

- Latitudes between -9 to -1.
- Below 34 degree longitude and above 37 degrees longitude

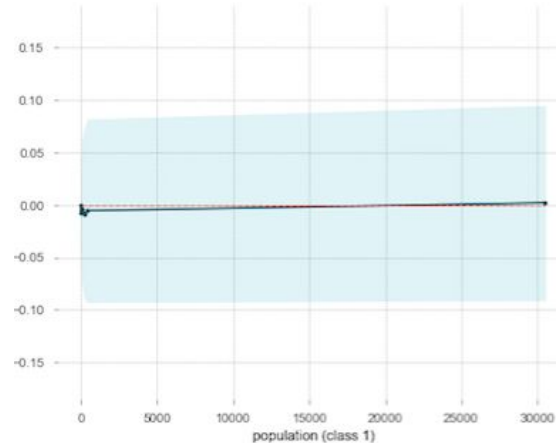
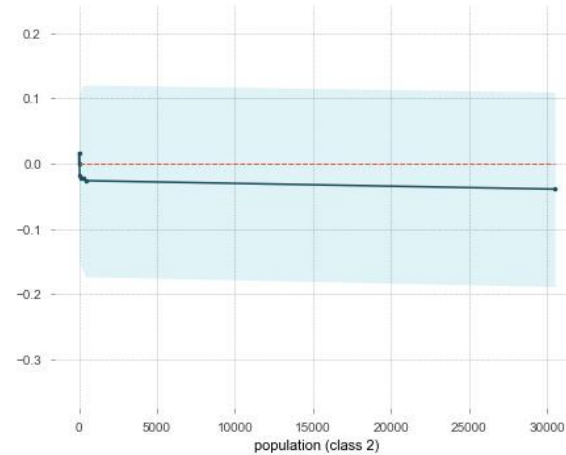


Prioritize remote pumps

Nonfunctional pumps likely to be located near smaller population concentration.

Focus on those pumps first for replacement if not dry.

Repairs: Pumps near 0 population and pumps near high population with high use.





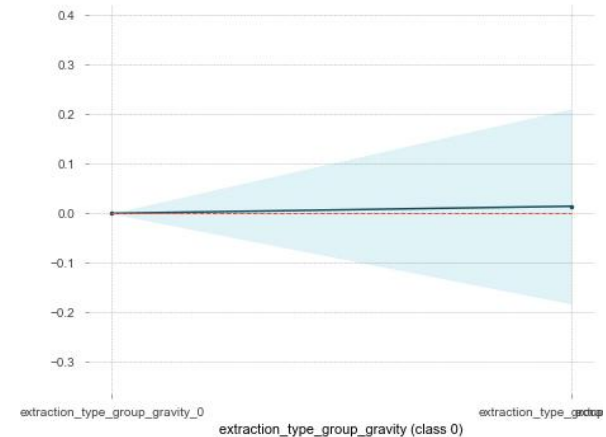
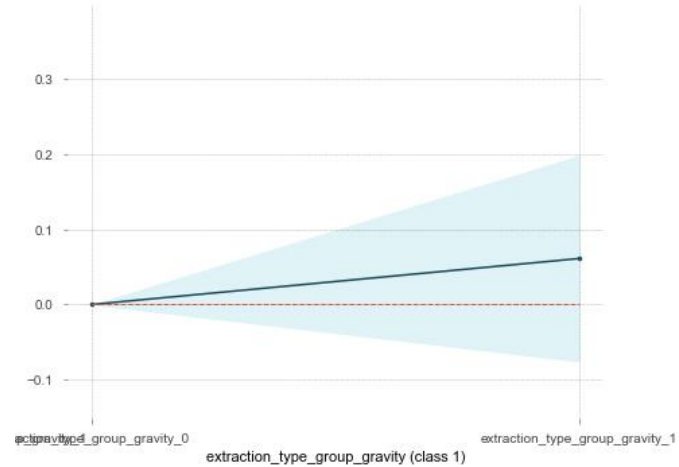
Gravity extraction pumps

High chance of needing repair

Most likely functional.

Check on those as priority.

Build different type, more resilient pumps.





Summary & Recommendations

1

Look for nonfunctional pumps:

- Between latitudes -9 to -1.
- Below 34 degree longitude and above 37 degrees longitude

3

High chance of needing repair but still functional.

Check on gravity type as priority.

Build different type, more resilient.

2

Focus on remote pump replacement if not dry.

Repairs: Pumps near 0 population and pumps near high population with high use.



Future work

- Fix filler data in longitude, latitude for better accuracy of geo coordinates for nonfunctional pumps. (Same for population and amount of total static head.)
- Do the latitude and longitude degrees where most broken water pumps are found have to do with lack of proper authorities and management (business or political)?
- Compare that to data on public meetings held for different districts for better political insight.



Thank you.