

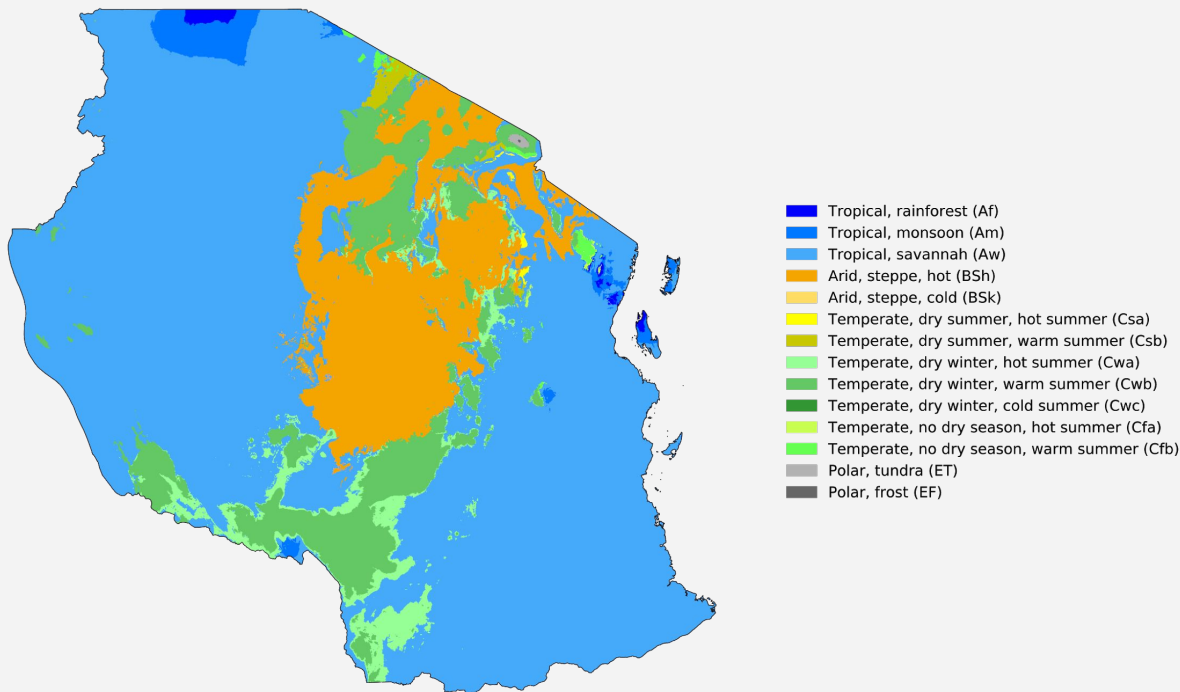
Development of a predictive model for targeting Tanzanian water wells for replacement with our water pump

Lucas Blasdel and Wyatt Sharber

Motivation

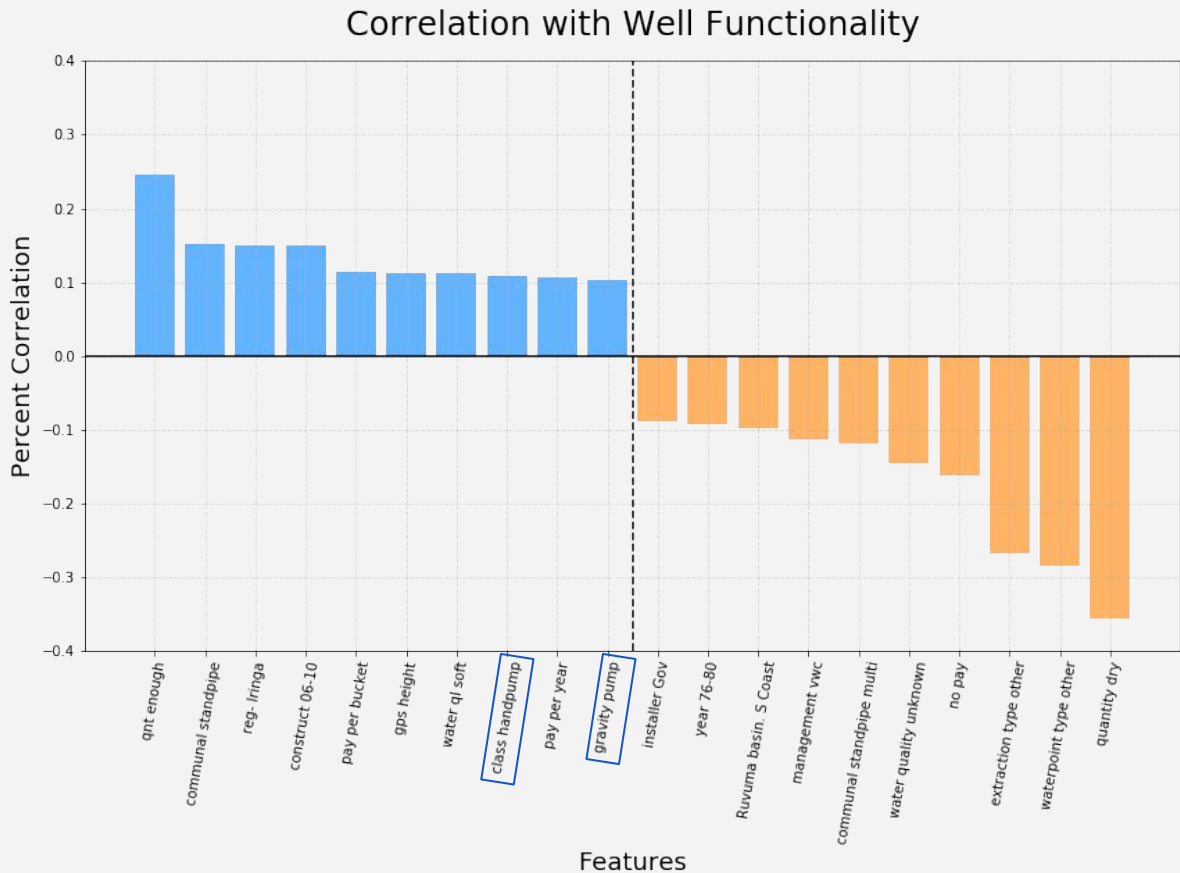
- Easy access to a water source improves quality of life by allowing more time to be allotted to education, employment, and other activities
- Country has a large amount of available water, the only question is how to access it?

Köppen-Geiger climate classification map for Tanzania (1980–2016)



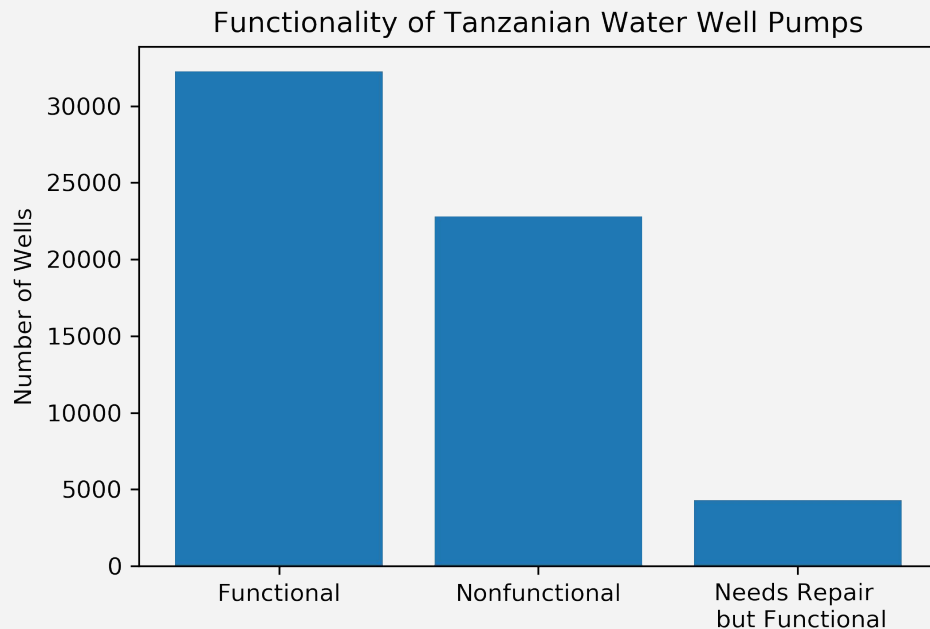
Motivation

- NGOs looking to impact life in Tanzanian communities should focus their efforts on repairing, upgrading, or installing high quality, low-maintenance local water wells

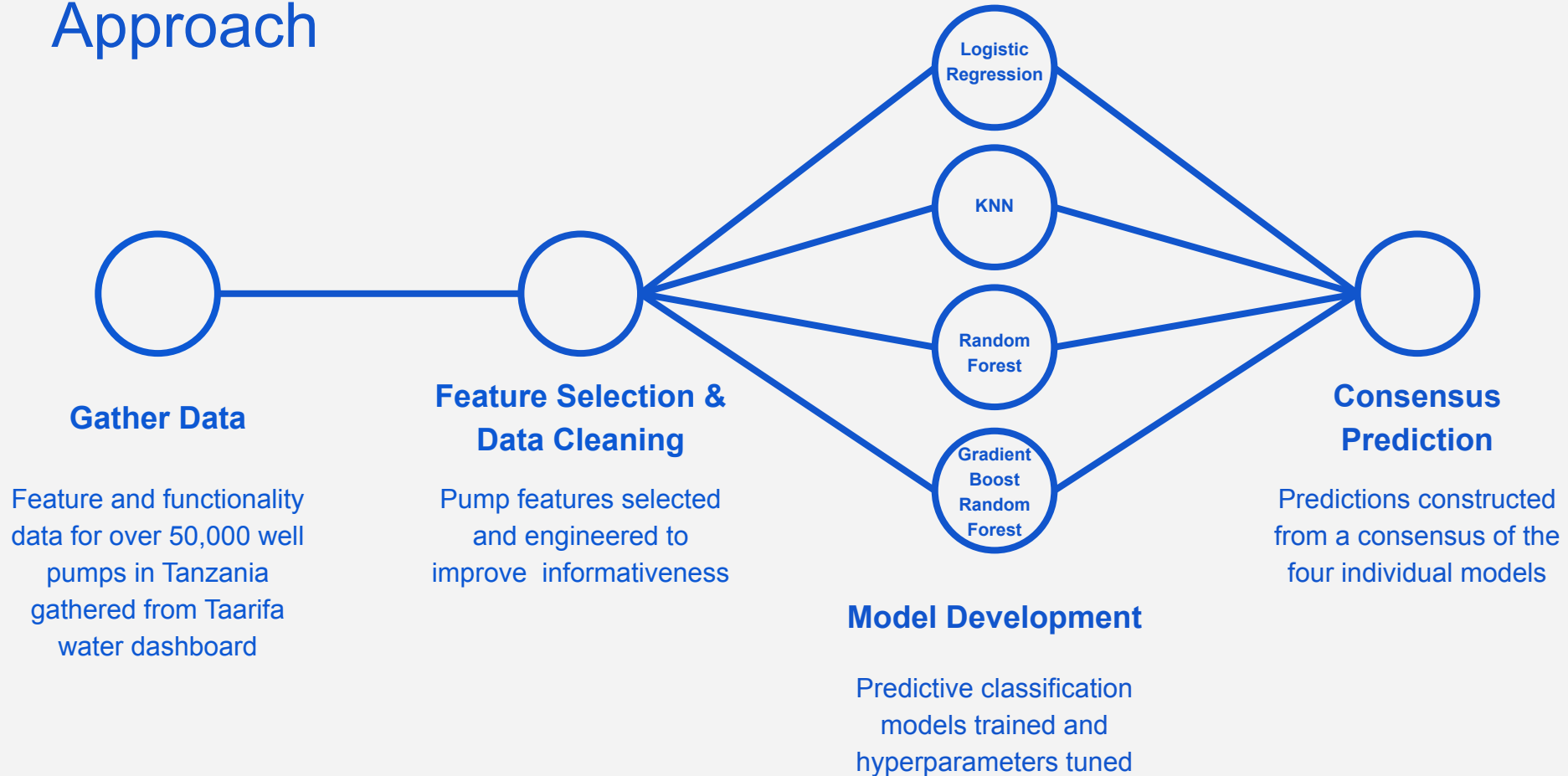


Objective

- We present a predictive model with over 80% accuracy that identifies candidate water pumps for replacement with our simple, reliable pump model

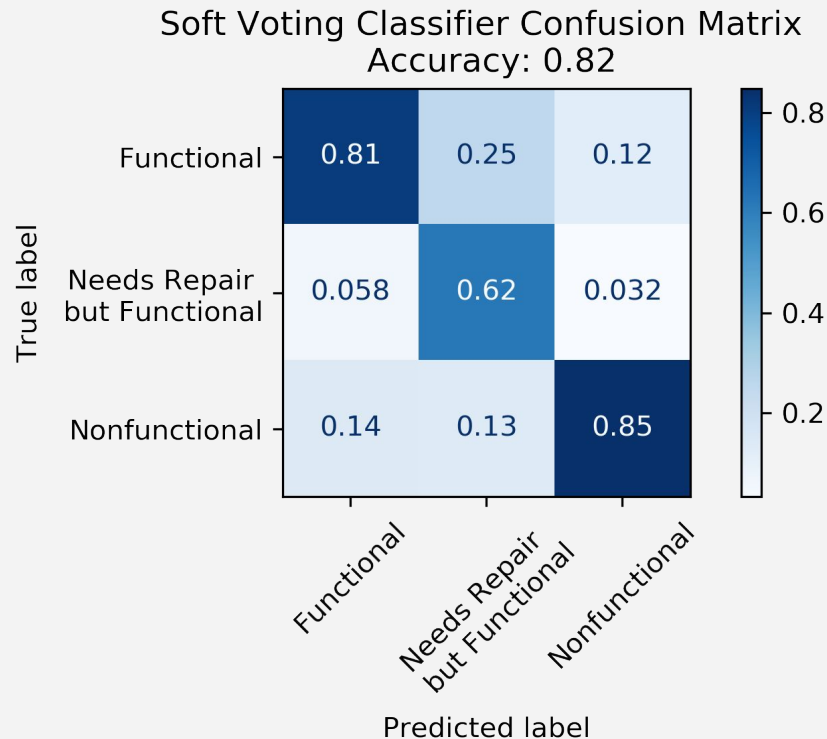


Approach



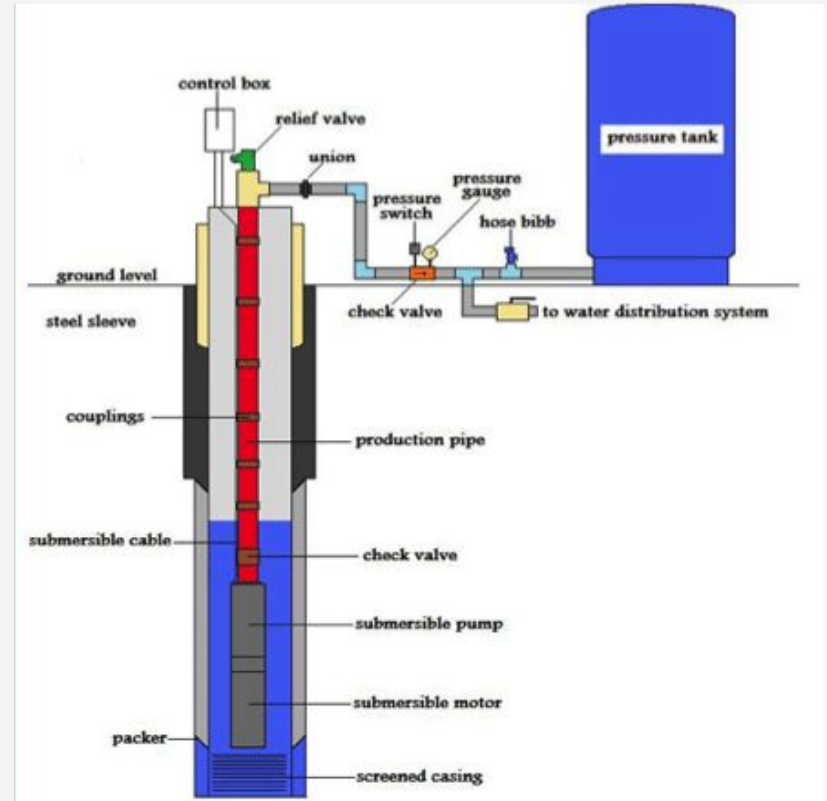
Results

- By implementing a Soft Voting Classifier across our 4 individual models, we are able to get better results than any single model
- Our consensus model has an accuracy of 82%
- Our model is especially good at identifying nonfunctional well pumps, which could be replaced with our pump



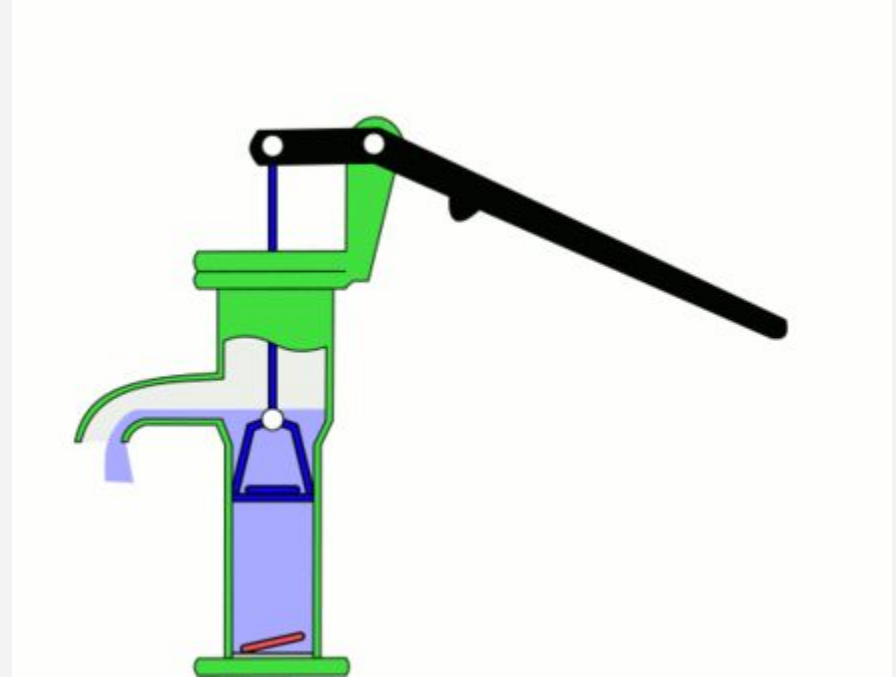
Biggest factors

- The biggest controllable factor is the type of pump being used
- Gravity and hand pumps are positively correlated while mechanical/other pumps are negatively correlated
- Other factors: total static head and elevation of the well.
- Big issue - lack of data



Recommendations

- Buy Our Pump - no complex mechanical parts.
- Help organizations collect data in impoverished areas.
- Focus large mechanical pumps in high density urban areas where regular service is feasible.



Suggested Improvements & Future Directions

- Address class imbalances to better identify wells that need repair but are still functioning
- Add functionality to prioritize wells in more populous areas or areas without other water sources
- Further investigate things that correlate specifically with pump failings and not just well overall functionality. (many wells were non functional because they had no water)