Tanzanian Water Well Classification

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About Tanzania

- Combined Tanganyika mainland with Zanzibar archipelago.
- Coastal East African nation bordered by Uganda, Kenya (N); Mozambique, Malawi (S); Rwanda, Burundi, DR Congo (W).
- Many hominid fossils found in Tanzania.

Background

- Tanzania subject to German and British colonization until 1961 independence.
- Political destabilization, hunger, poverty, resource scarcity.
  - Poor access to water
- Dependency on colonizing powers to maintain infrastructure via capital.

Objective

- Determine which factors predict water well functionality.
- Examine the extent to which Tanzanian vs external funding predicts functionality.

Methods

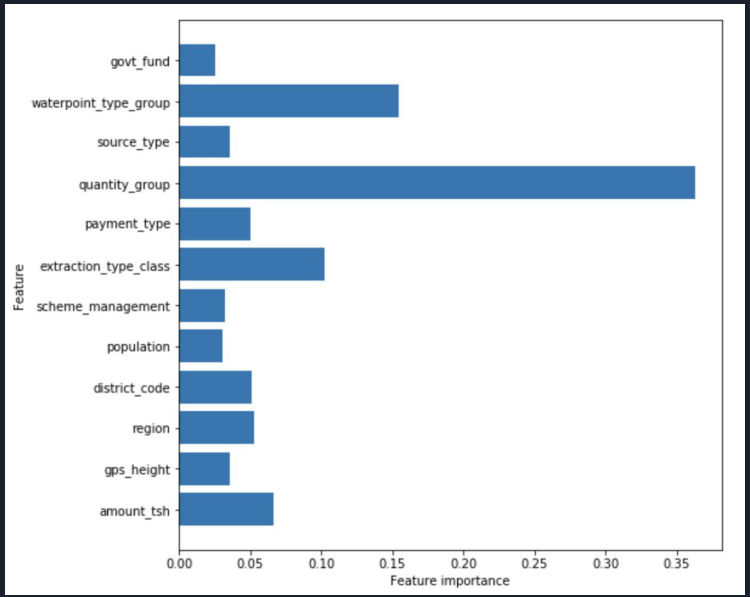
- Out of majority 20, classify as either **government** or **non-government**.
  - Government of Tanzania
  - Ministry of Water
  - District council
  - RWSSP
  - TASAF
- Train, test, and compare 4 different model types for highest accuracy.
- Selected model based on accuracy and consistency of feature importance.
- Tuned model for optimization.

Data

- Data on over 59000 water wells from Taarifa and Tanzanian Ministry of Water provided by Flatiron School and DrivenData.
- Data as recent as 2013.

Results

- **Government / Non-government:** 22.5% / 77.5%
- Selected Random Forest Classifier with **73.4%** accuracy.
- **Main predictors:**
  - Quantity in well
  - The type of well
  - Extraction method
- Type of funding was not a significant predictor in well functionality.



Limitations

- Colonization is multi-dimensional; funding source is one aspect of infrastructure.
- Approach has not thoroughly explored geographic factors.
  - Urban-rural disparities.
- First iteration, model is not yet optimally tuned.

Future Work

- Examine other aspects of infrastructure as result of colonization.
- Utilize more robust geographical data methodology for urban-rural disparities.
- Technical aspects of model tuning and different approaches to the data.

References

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Thank you!