

# Status of Tanzania Waterpoint Pumps

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## Project Goal

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Provide Tanzanian Government with the ability to predict the status of waterpoint infrastructure.

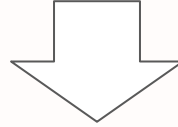
## Reasoning

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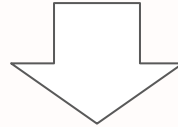
The Tanzanian government is struggling to provide water to its growing population. Providing insights into the future status of their water infrastructure will enable them to prepare for future water demands.



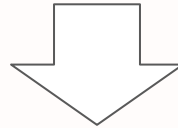
Data from Taarifa and Tanzanian  
Ministry of Water



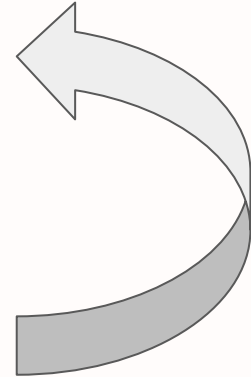
Exploratory Data Analysis



Modelling



Communicate findings, explore next steps

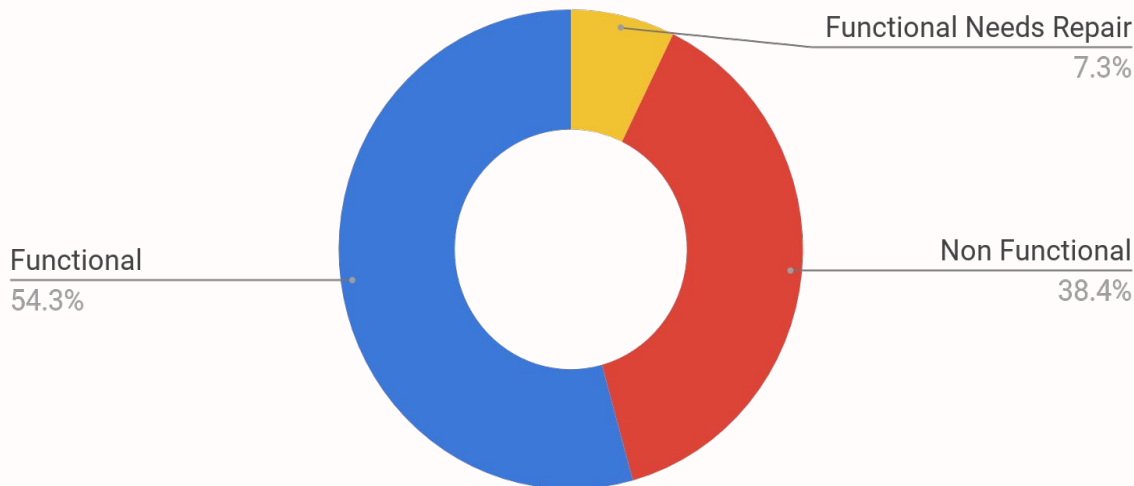


# Data Overview

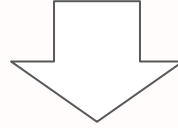
59,400 entries    41 features

- Describes wellpoints in Tanzania
- Dataset from [Driven Data competition](#)
- Significant amount of categorical data
- Background data but not usage data

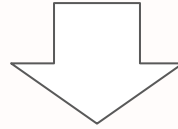
Class Balance



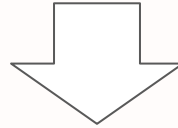
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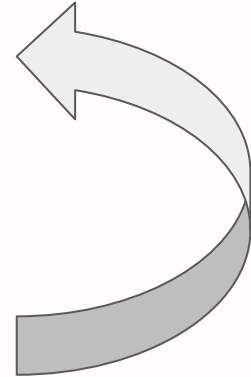
Exploratory Data Analysis



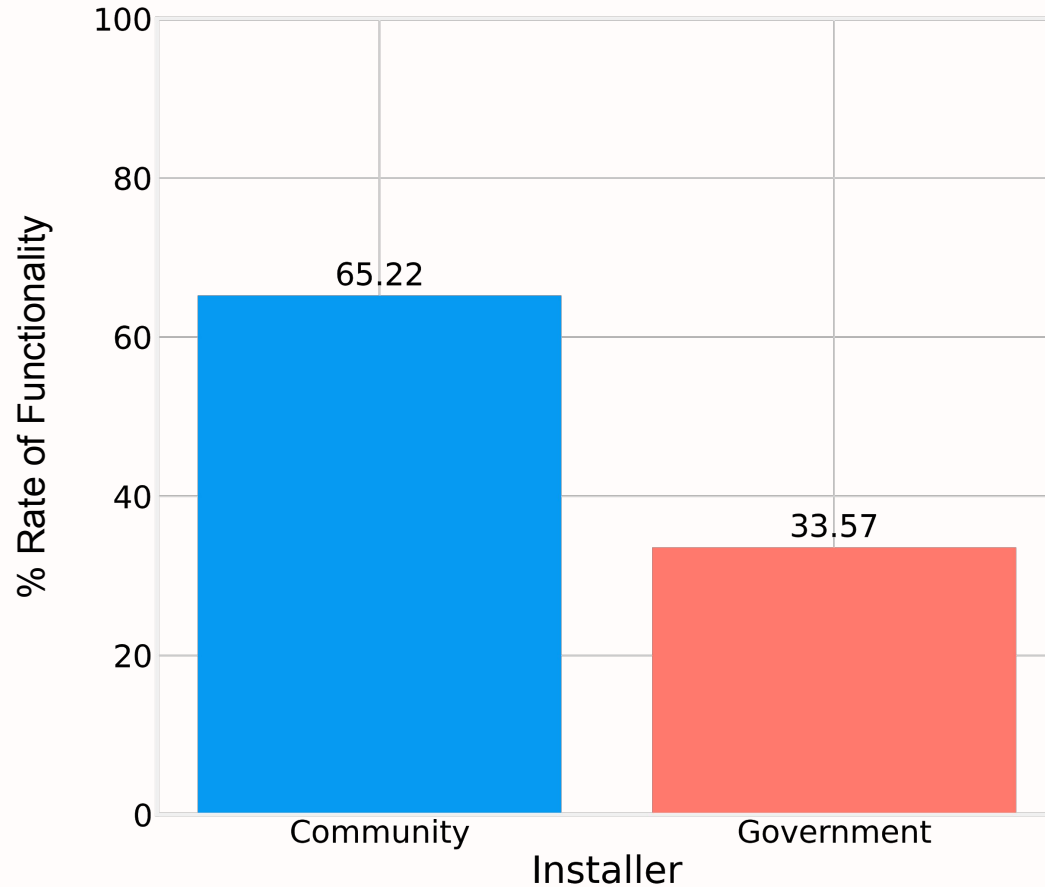
Modelling



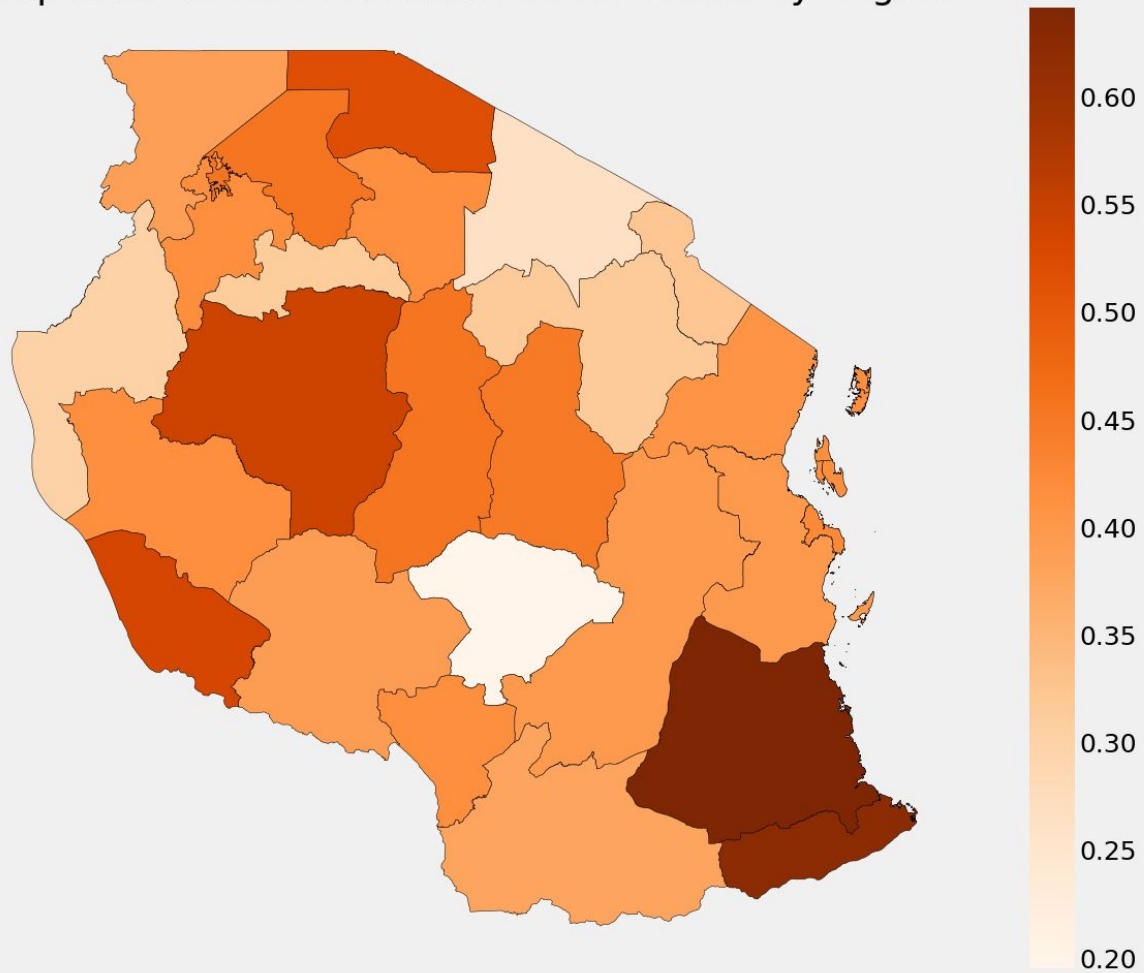
Communicate findings, explore next steps



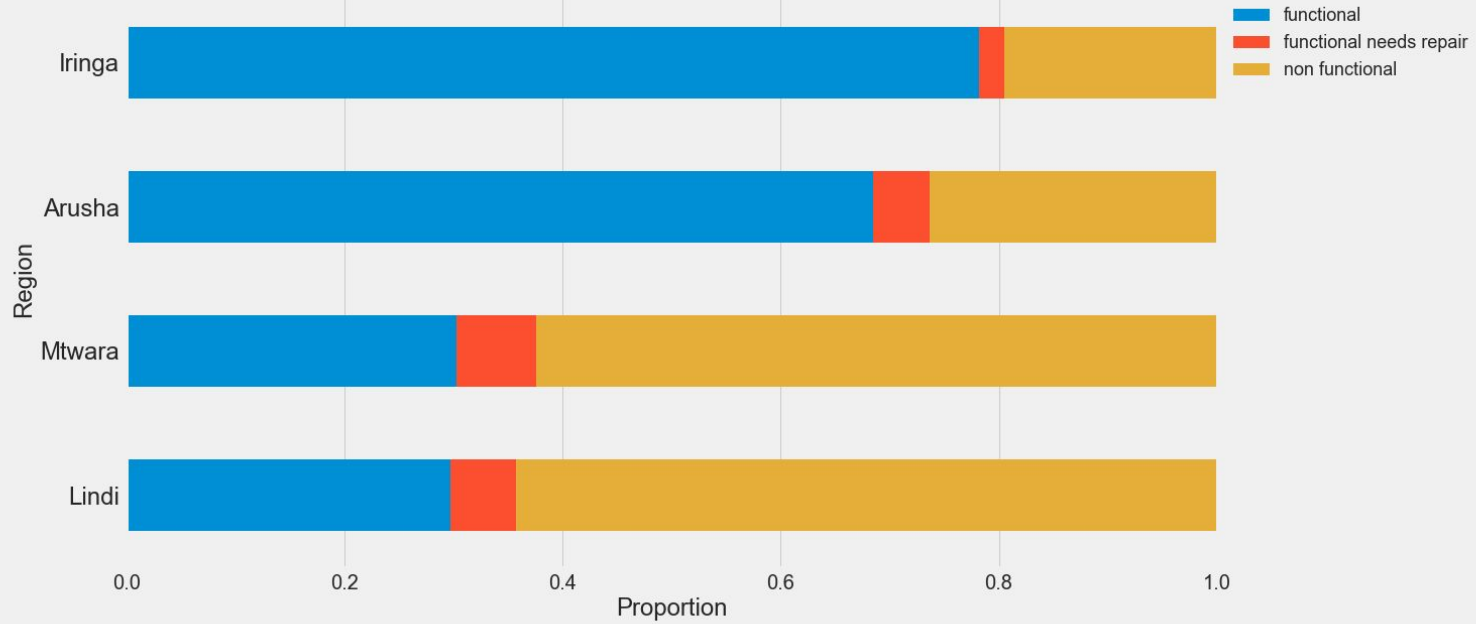
## Community Installed Wells are More Likely to be Functional than Government Wells



Proportion of Non-Functional Water Points By Region

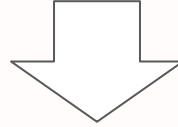


## Water Point Status Disparity in Select Regions

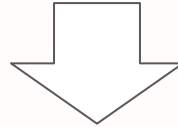




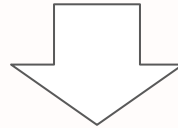
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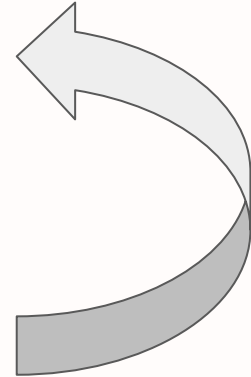
Exploratory Data Analysis



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# Modeling

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## Optimizing for non-functional recall:

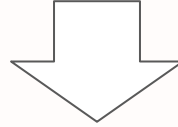
- Our goal is to create a model that is extremely sensitive to broken wells.
- User should be confident that few non-functioning wells will 'slip past the radar'

### Final Model

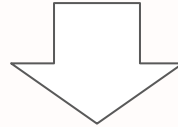
#### XGBoost Classifier

Accuracy	.83
Class 0 Recall:	.78

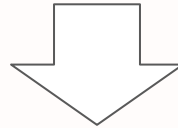
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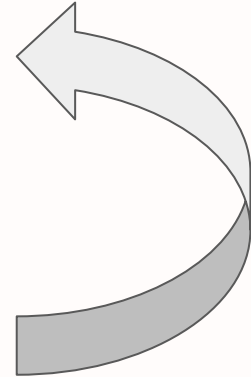
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# Findings/Insights

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## Region

The functionality of wells is regionally specific, with wells built in the Iringa region having much higher rates of functionality.

## Management

Commercially managed water points were found

## Installer

Our model found that installation by a District Water Engineer is a strong indicator for functionality.

# Business-facing Recommendations

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- More data on waterpoints
  - Current waterpoint usage
  - Observe longevity of waterpoint pump
- Funding
  - Increase funding for regions with more non-functional waterpoints
    - Subsidize private or community built wells
- Community Involvement
  - Including the community in the planning and building process of new waterpoints to improve general care

# Thank You

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## Project Repository

<https://github.com/sydroth/tanzaniawellclassification>

## Team Members



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