
FlowWELL
Doing well, better.

“Water is a key foundation, whose importance can hardly be overestimated ”

-Irina Bokova

UNESCO Director General

ABOUT THIS SLIDE DECK

This slide deck was created as part of a project completed by Kristen Davis at Flatiron School. This deck is written from the hypothetical perspective of a startup company looking to gain seed money from a funding group such as The Unreasonable Group.

This slide deck is in conjunction with a github repo found here

Skills Demonstrated within this project include:

- Proficiency in the Pandas, Plotly, Seaborn, Matplotlib, Numpy and sklearn libraries
- Advanced understanding of EDA & feature engineering techniques
- Machine Learning Techniques such as Decision Trees, Random Forest, GridSearchCV, Cost Function, RSME/ RME, ROC curves, Feature Importance and Confusion Matrices
- Ability to present non technical data insights & data analysis

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01.
THE NEED

The crisis for water in Tanzania

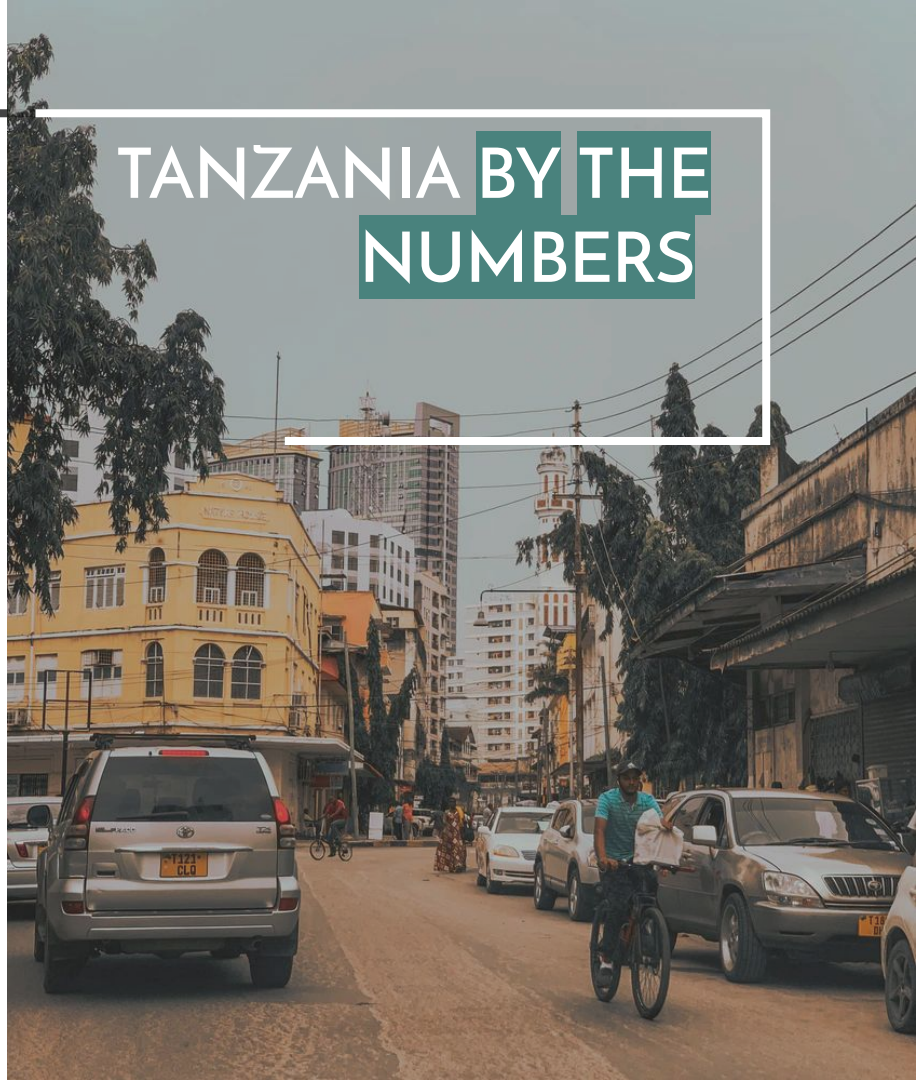
TANZANIA BY THE NUMBERS

57 Million people

85 Percent live on less than $3.20 per day

4.67 Million reside in the capital: Dar es Salaam

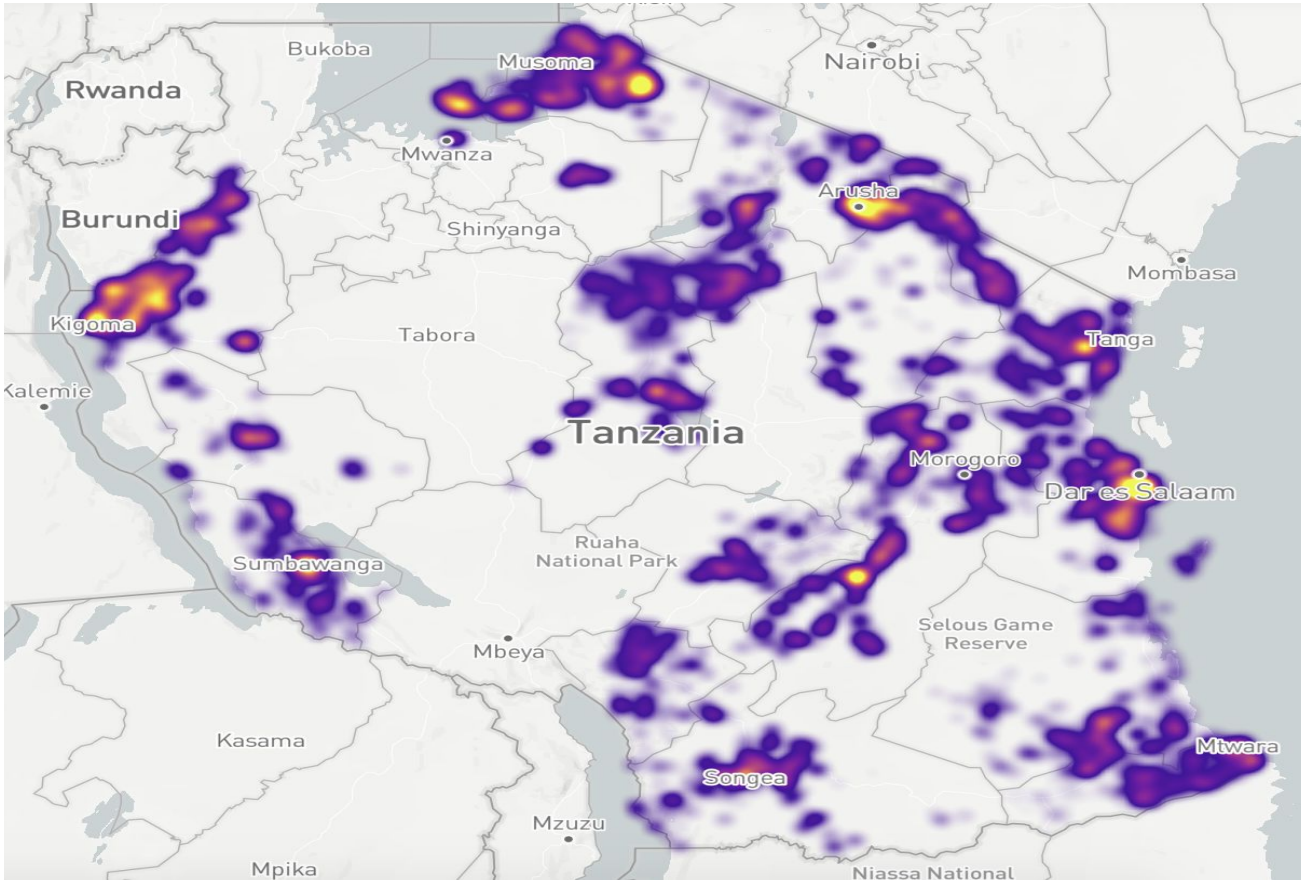
37 Percent of the population lives in urban areas



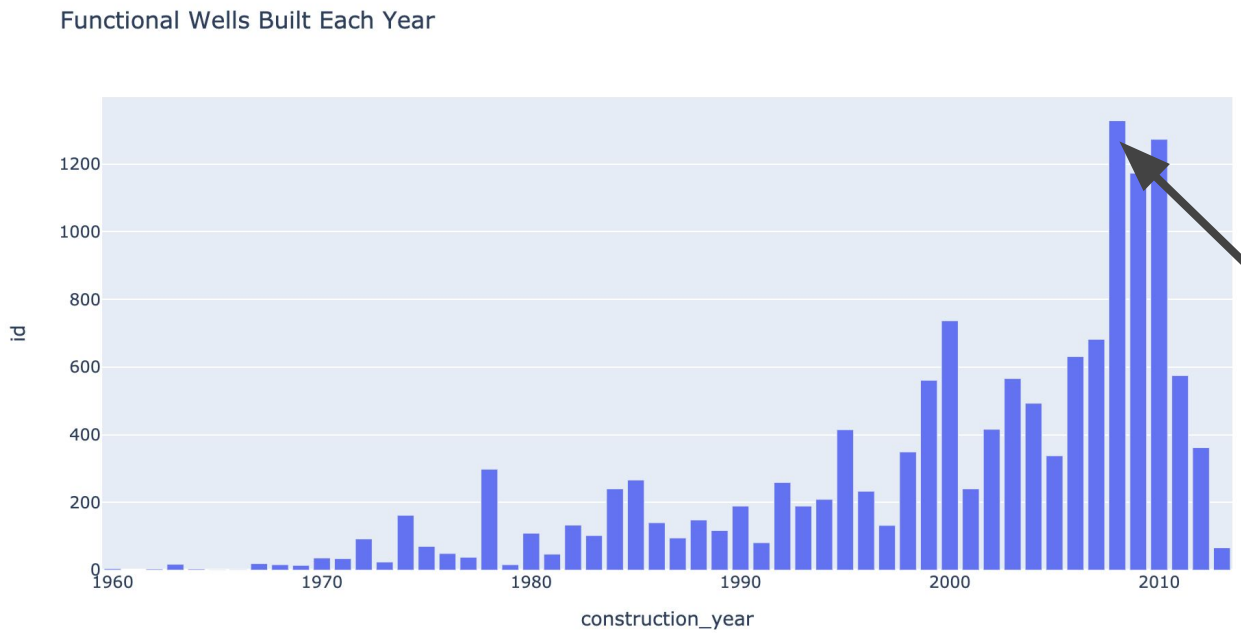
4 million people

In Tanzania lack access to an improved source of safe water -- People living under these circumstances, particularly women and girls, spend a significant amount of time traveling long distances to collect water.

CURRENT WELL DISTRIBUTION



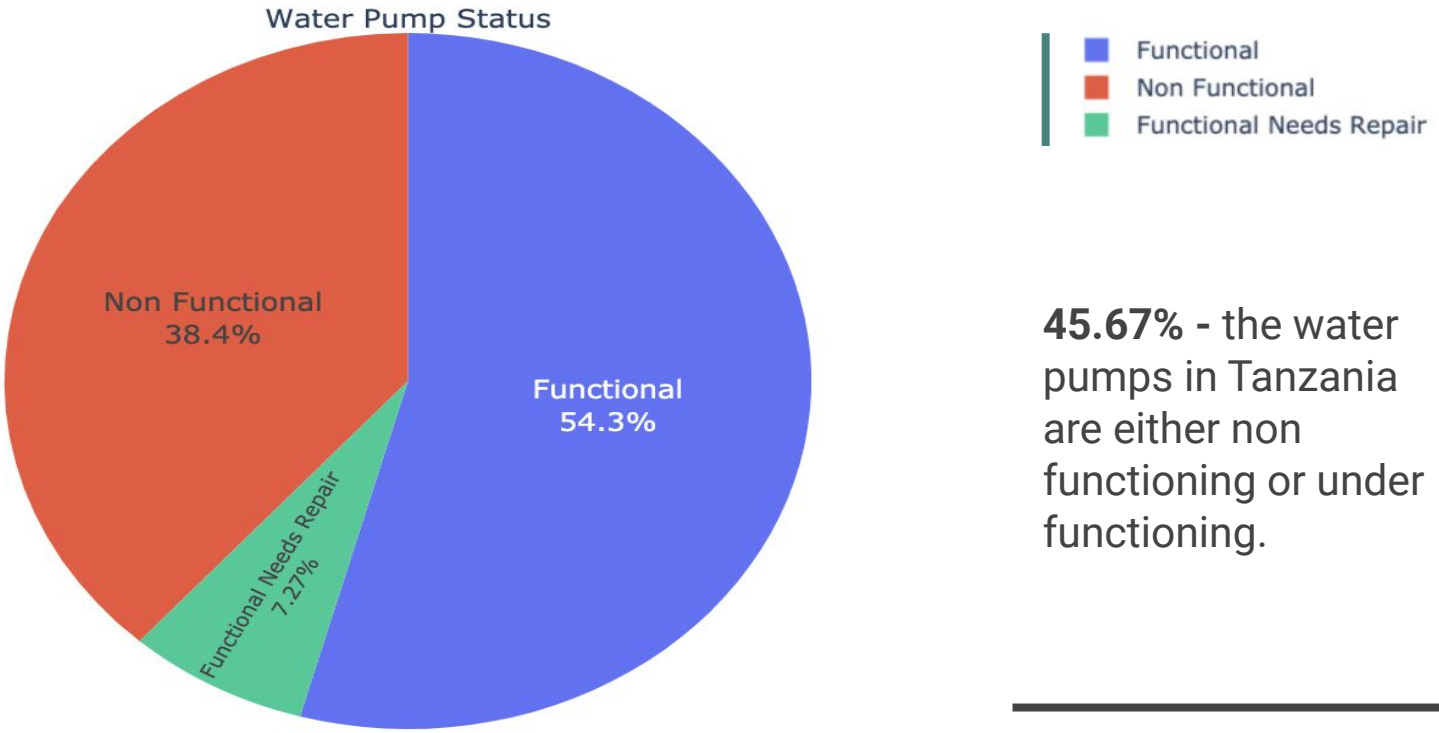
FUNCTIONAL WELL BUILT EACH YEAR



1328 still functioning wells were built in 2008


4,832 of the wells
constructed after 2000
have become non functional

CURRENT WATER PUMP STATUS

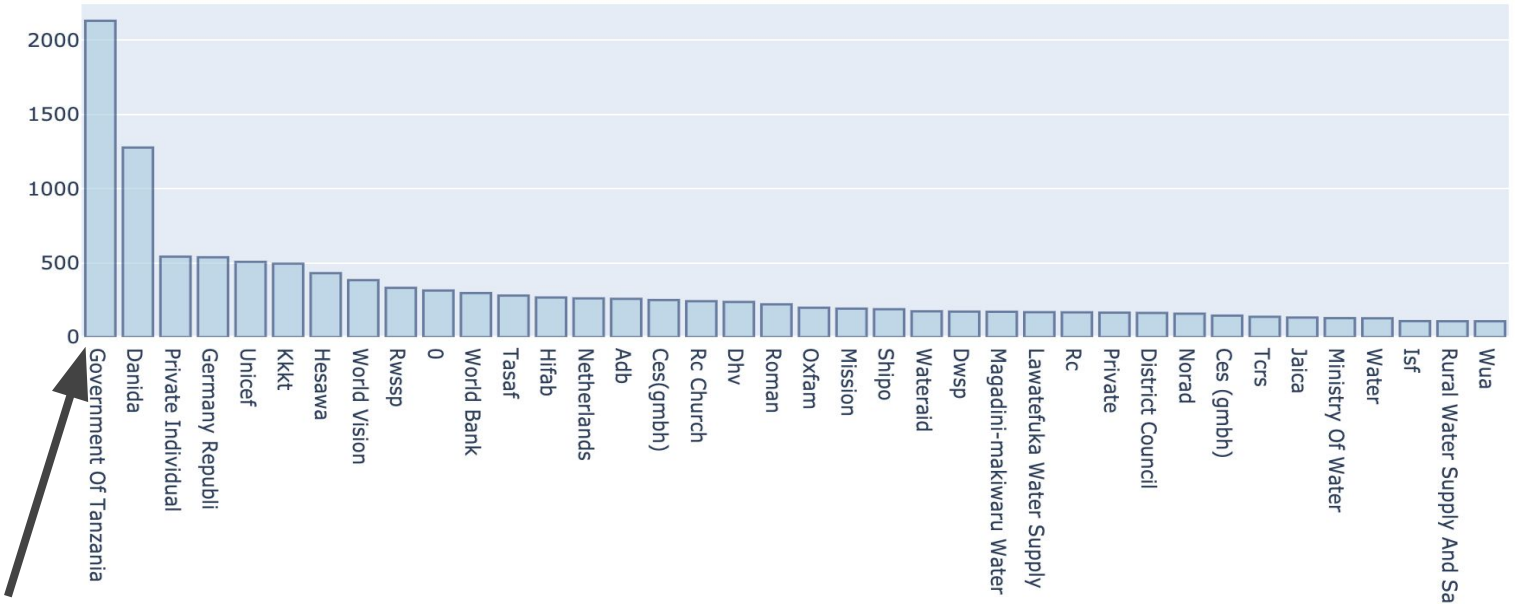


45.67% - the water pumps in Tanzania are either non functioning or under functioning.

02.
THE SOLUTION

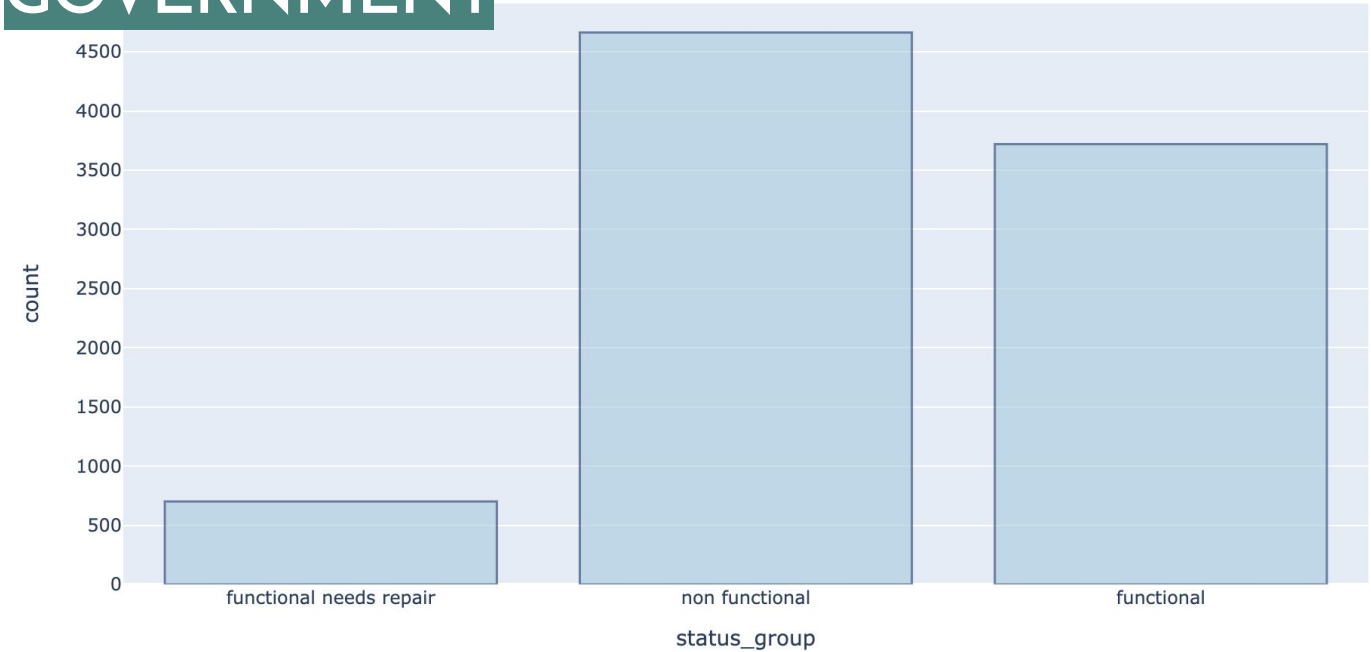
Existing structure repair & refurbishment

SUFFICIENTLY FUNCTION WELL FUNDERS



The Government of Tanzania is the primary funder for well functioning wells

STATUS OF ALL WELLS FUNDED BY THE GOVERNMENT



GOVERNMENT WELLS BY THE NUMBERS?

Of all wells funded and installed by the government

11%

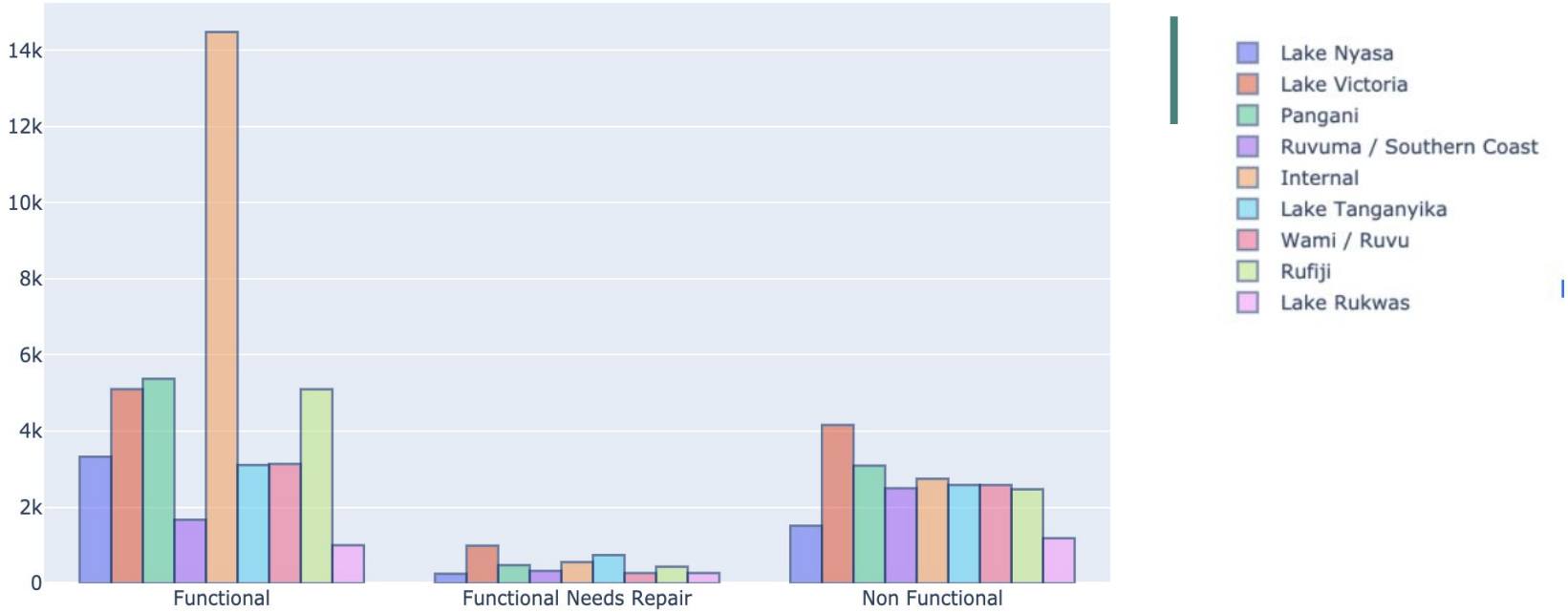
Use gravity as the extraction type

55%

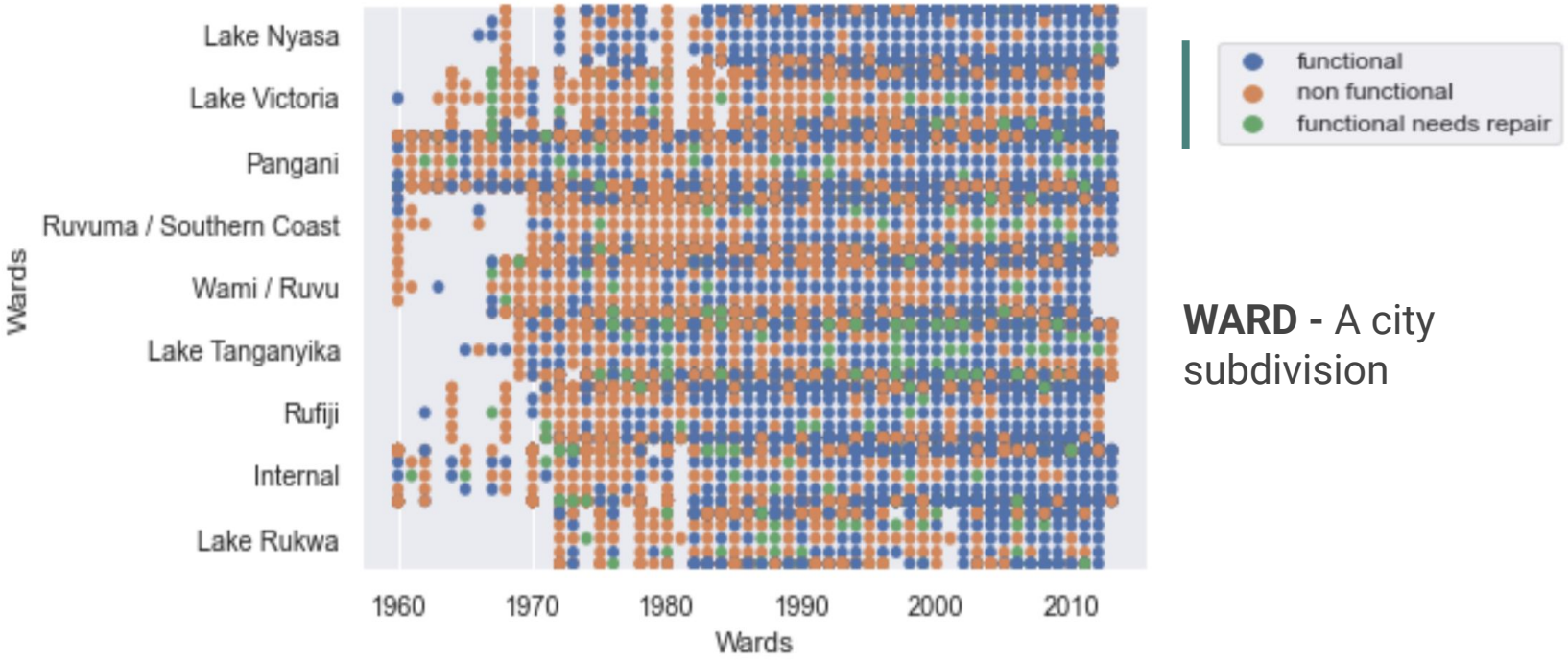
Use groundwater as a source

77%

WELL STATUS BY BASIN



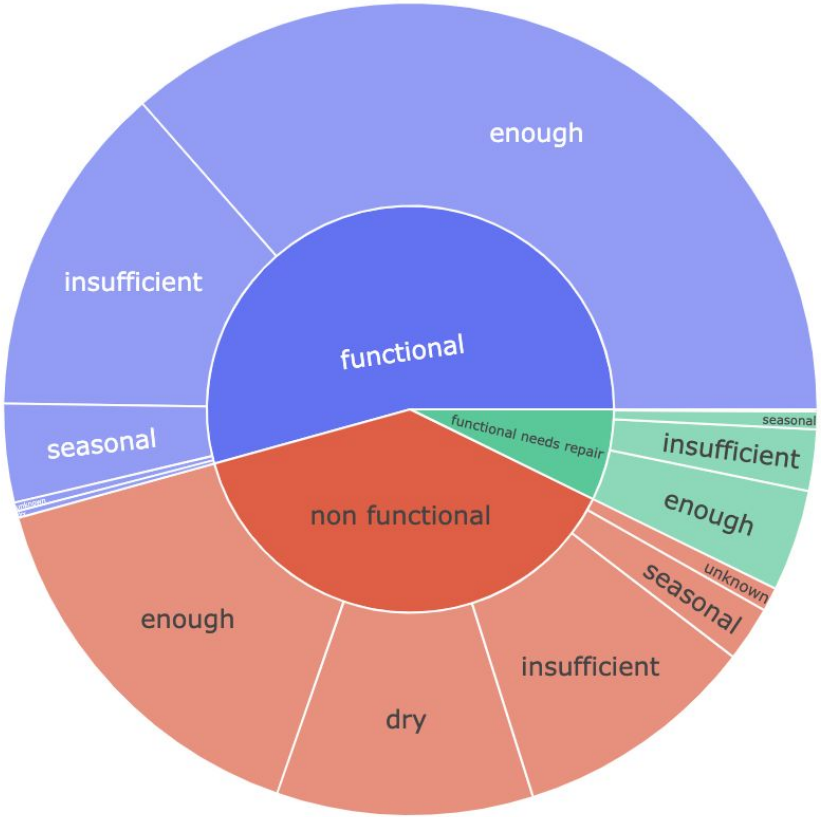
STATUS GROUP BY WARD



WARD - A city subdivision

03.
WHY FLOWWELL

Data driven predictive power



MAPPING WATER WELLS

INNER CIRCLE:
Well Status

OUTER CIRCLE:
Water Quantity

DATA DRIVE NON PROFIT APPROACH

At FLOWell data mining and machine learning lead to:

- Targeted Repairs
- Ability to classify new wells status
- Deep domain knowledge

In combination this allows FLOWell to do the most good with the smallest necessary capital.

04. CONCLUSION

Summary analysis and future work

MACHINE LEARNING MODEL

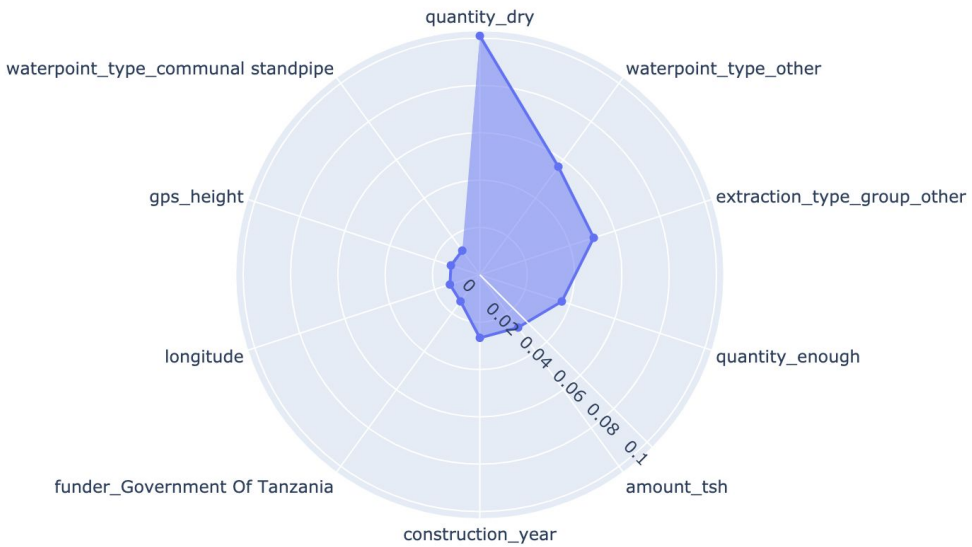
84%
Accuracy when predicting non functioning wells

94%
Recall when predicting functional wells

79%
Overall model score predicting functional wells

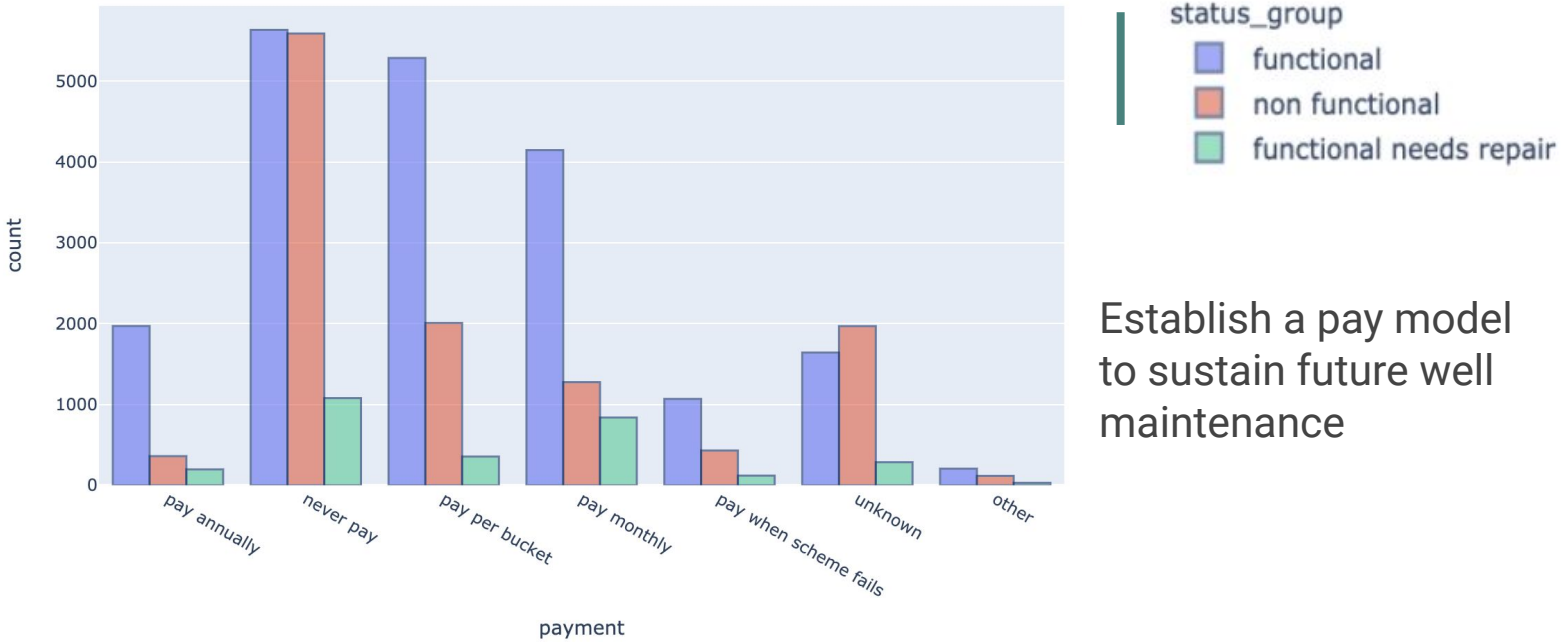
FEATURE ANALYSIS

Top 10 Most Important Features



WEIGHING FEATURE IMPORTANCE

CURRENT WELL PAY STRUCTURE



Establish a pay model to sustain future well maintenance

THANKS!

If you have any suggestions, feedback or questions please reach out!

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PROJECT RESOURCES

PHOTOS

Unsplash.com
Water Quote

SLIDES

Slidesgo.com

RESEARCH

Water.go