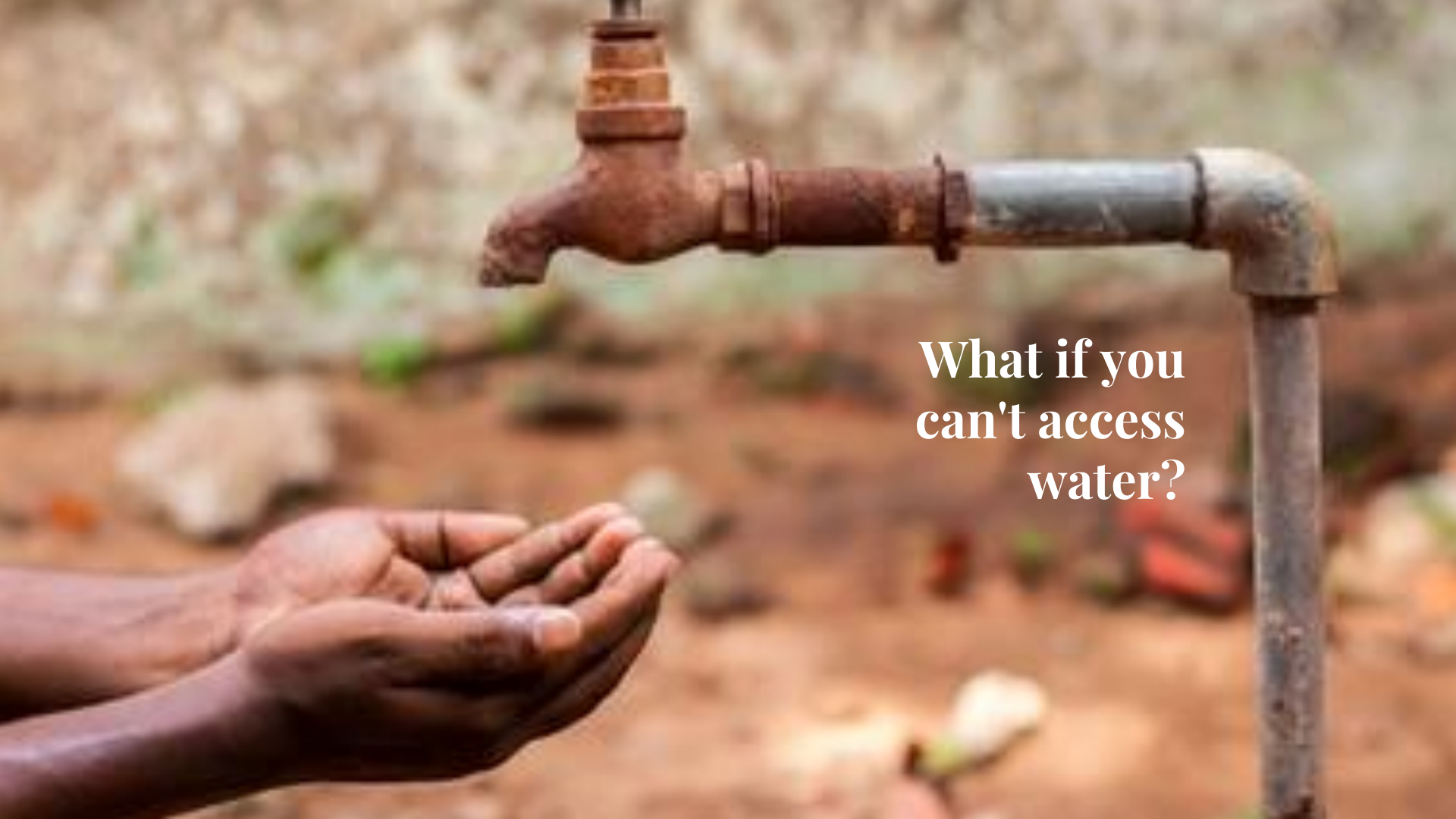
THE WATER PROJECT

PREDICTING WATER PUMP FUNCIONALITY IN TANZANIA

A project by Elena Salgueiro


What if you
can't access
water?

The world water crisis

#5th global risk in terms of impact to society.

Water connects
every aspect of life

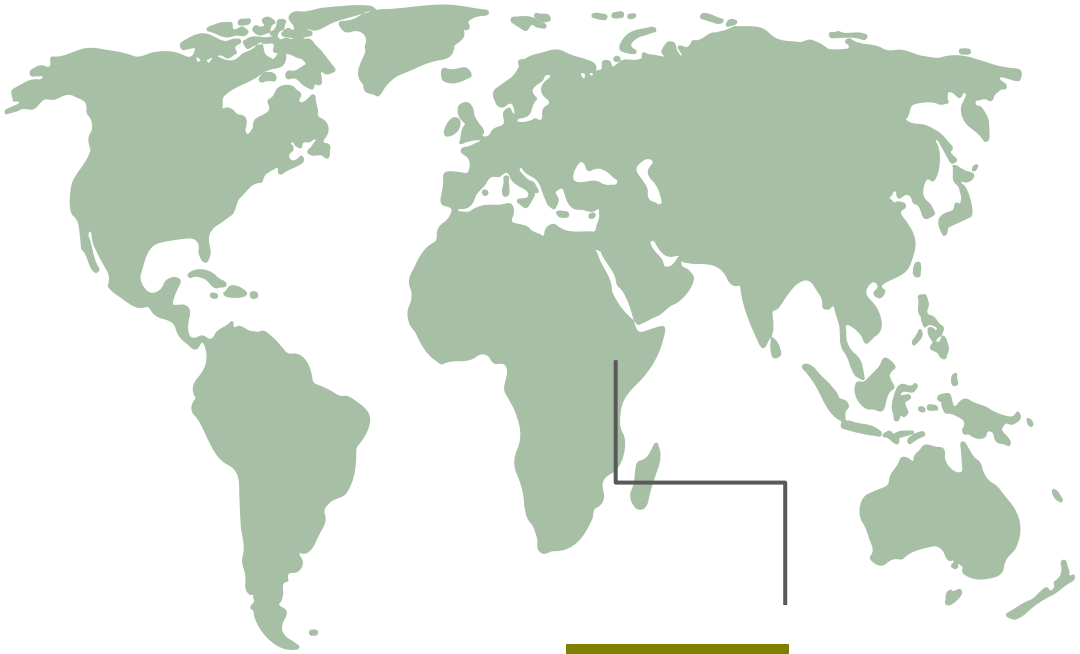
Health

Education

Economic

Equity

785 Million people living
without access to safe water



4 Million in **Tanzania**

Tanzania water point campaing

Hand pumps

Damns

Comunar standpipe

How can we help to solve the problem?

#We need
DATA

The **Tanzanian Ministry of Water** have kept detailed data of 59.400 water pumps that have been installed in the country.
40 variables describing the characteristics and situation of each water pump

*The data for this project obtained through Driven Data website.

#The SOLUTION

KEY INSIGHTS

Potential causes for water pumps malfunctioning in order to achieve future improvements

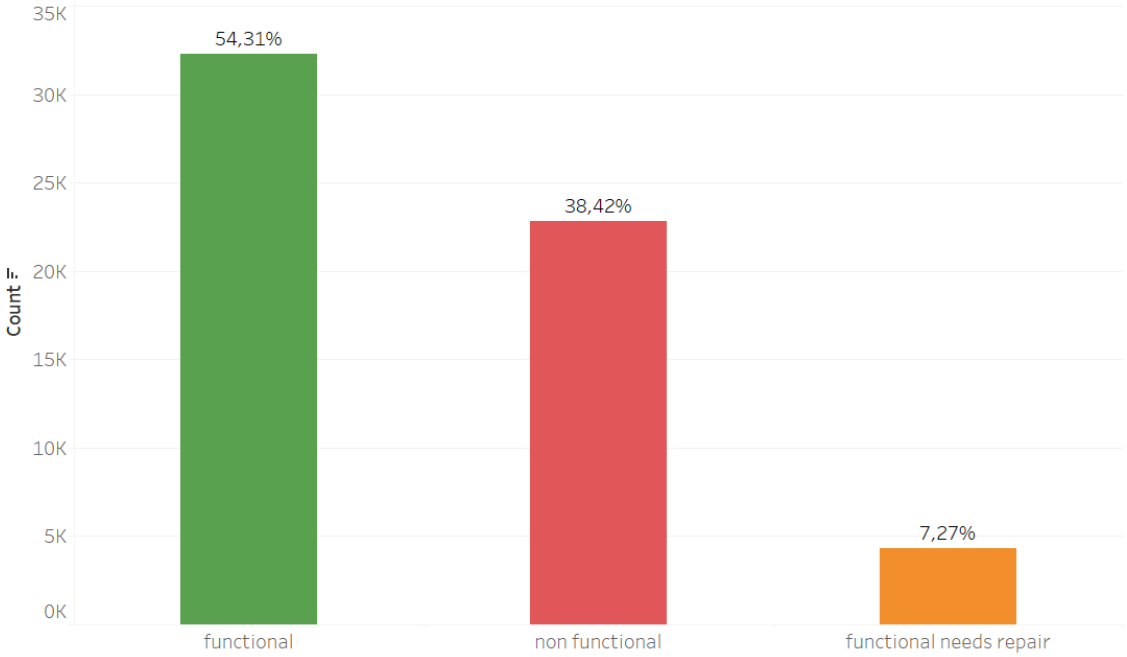
PREDICTION MODEL

Predict the maintenance requirements of the water pumps for guarantee functionality and improve the cost-effectiveness of these maintenance operations

What does the data tell us?

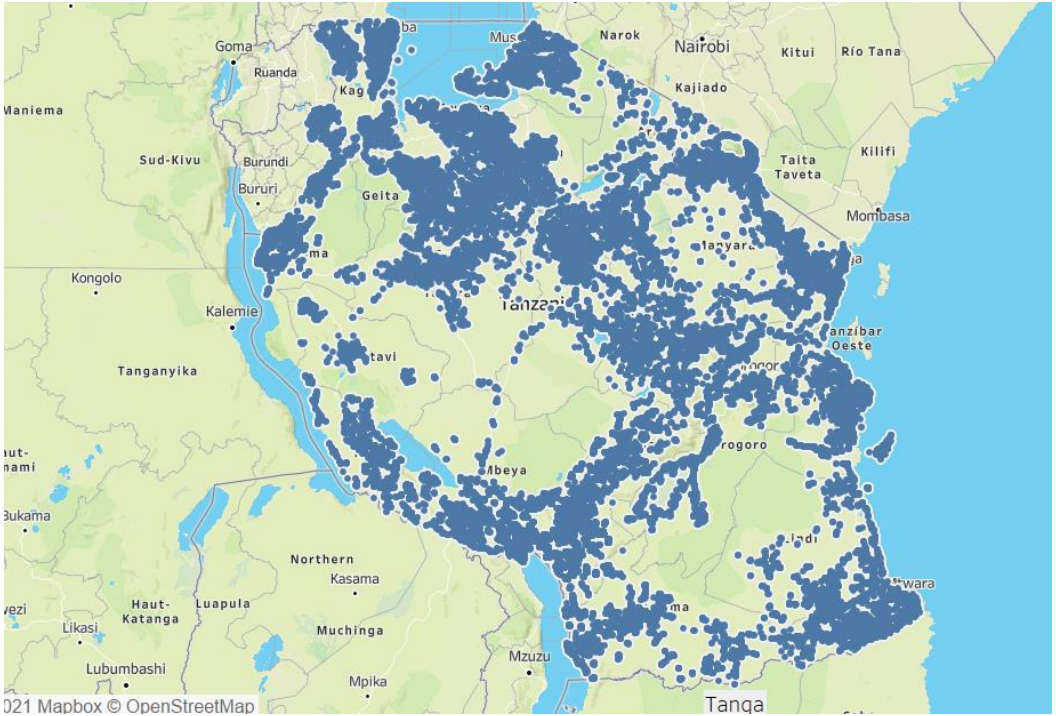
#Water points functionality status

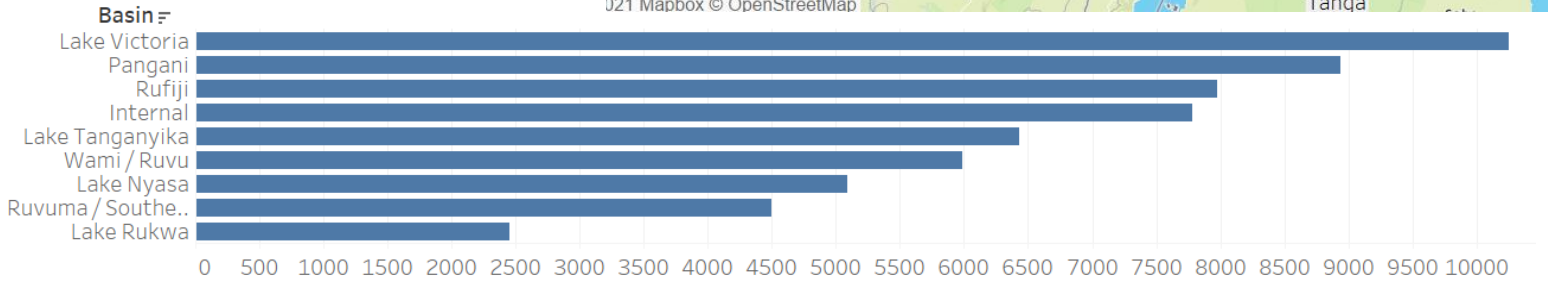
Almost half of the waterpoints installed are not functional or they do not work properly.

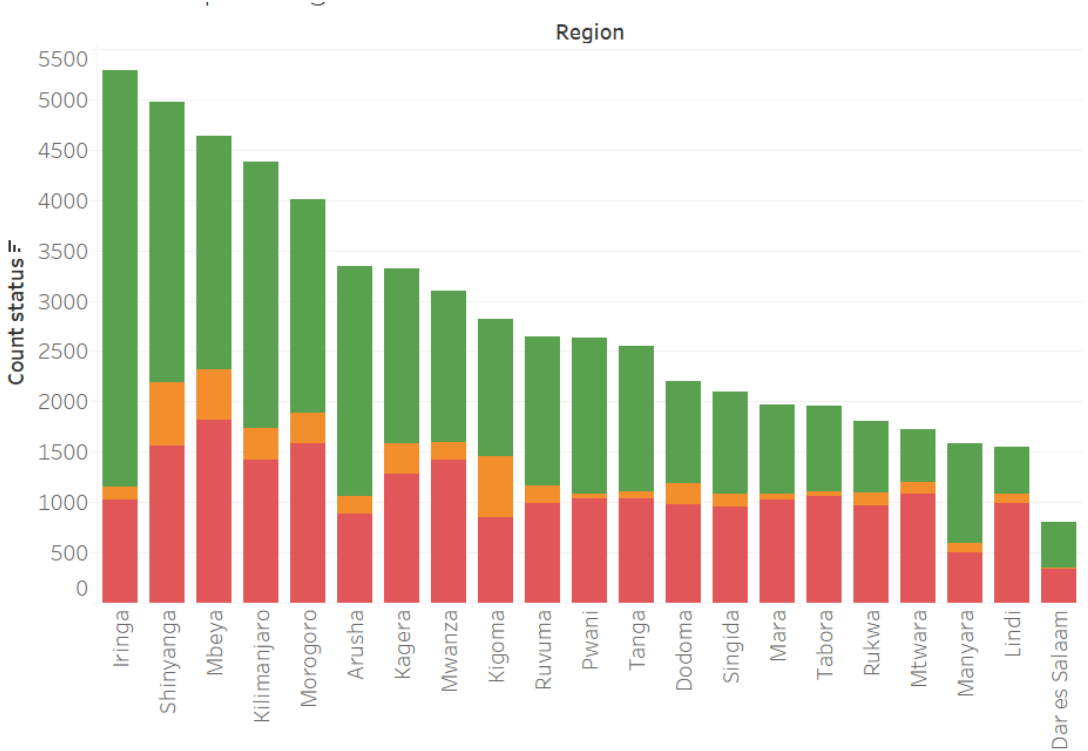


#Geographical distribution

Water points are situated around the main lakes and rivers within Tanzania





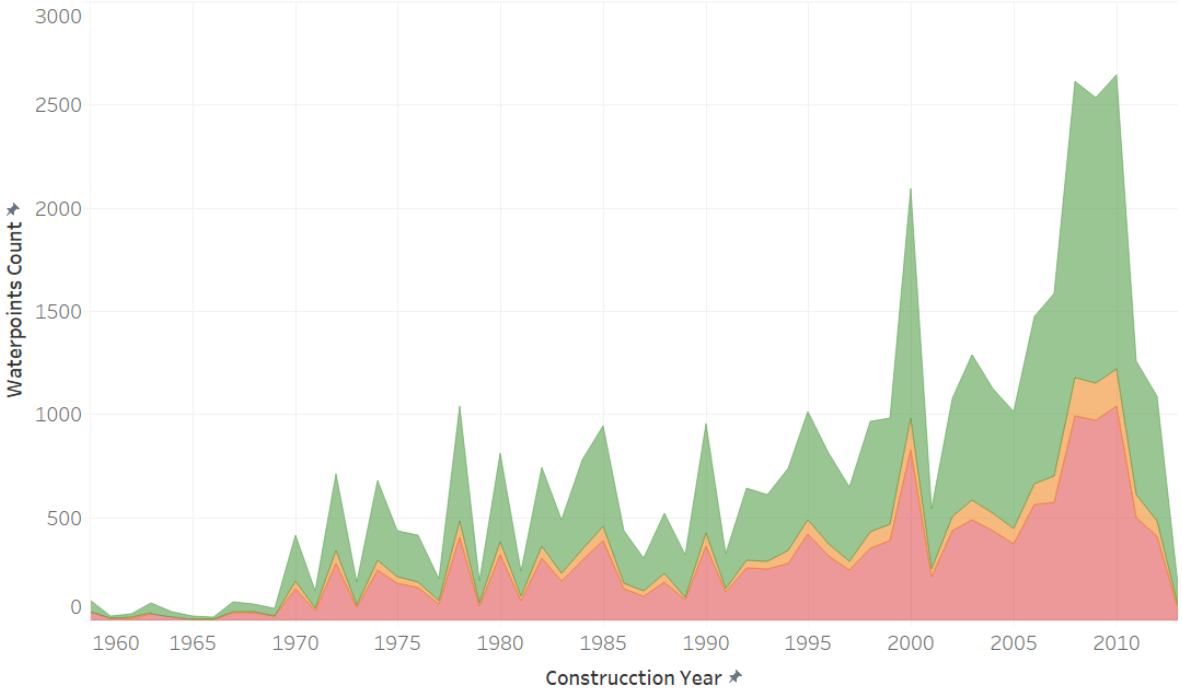


#How does the region of a well relate to its functionality?

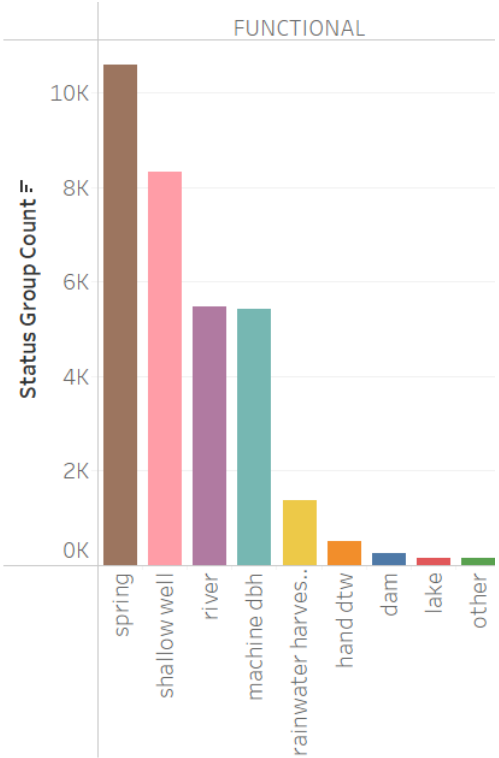
Non functional rate is extremely high in some regions.

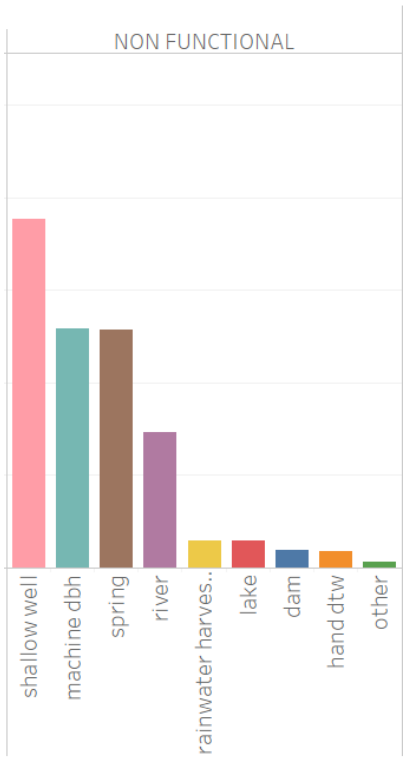
#How does the age of a waterpoint relate to its functionality?

The ones that were built recently are as likely to be not functional as older one.
This is very worrying!



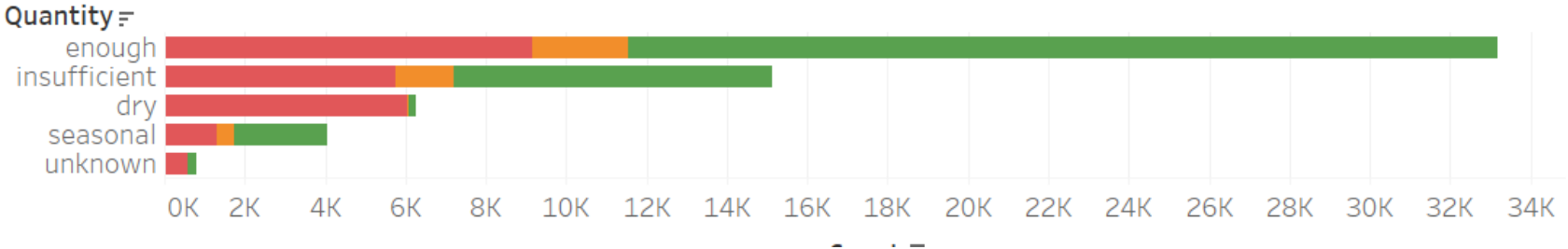
#The source of a waterpoint affects its functionality





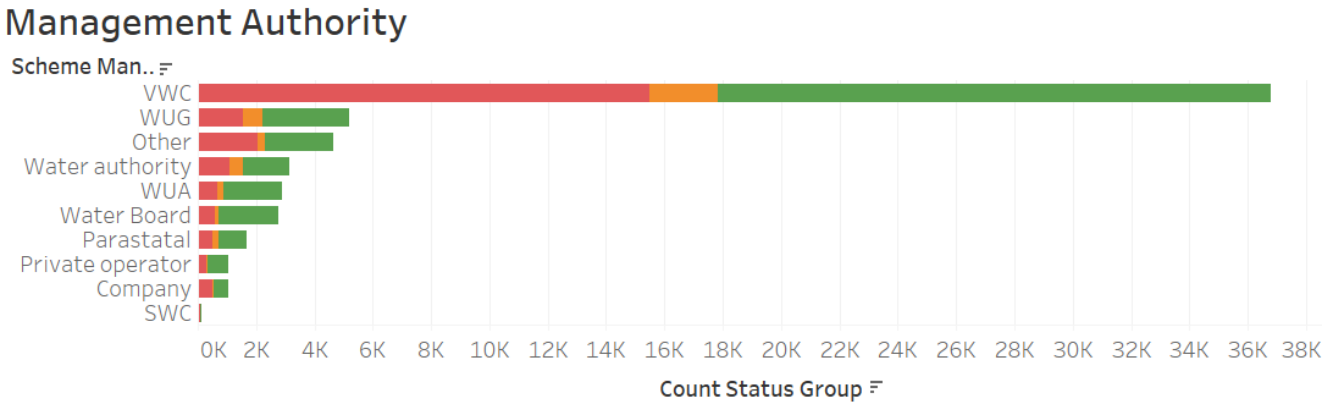
Ground water is the major source of water, but those water points are more likely to be unfunctional

#The quality and quantity of the water matters



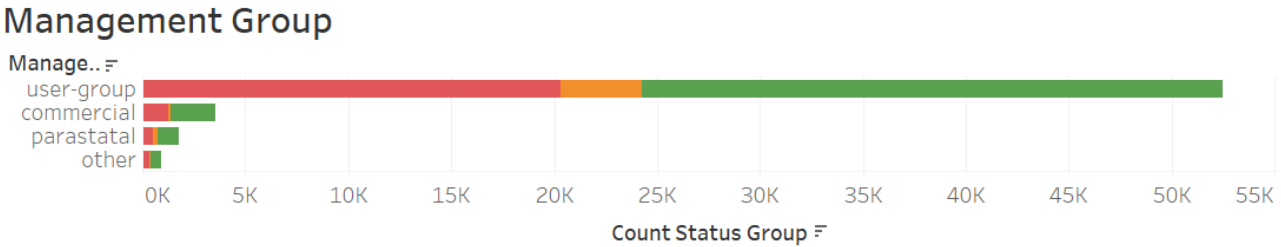
Obviously dry water pumps are the most likely to be non-functional.
But not functional rate in those with enough and good water is also worrying!

#The management of the water point?



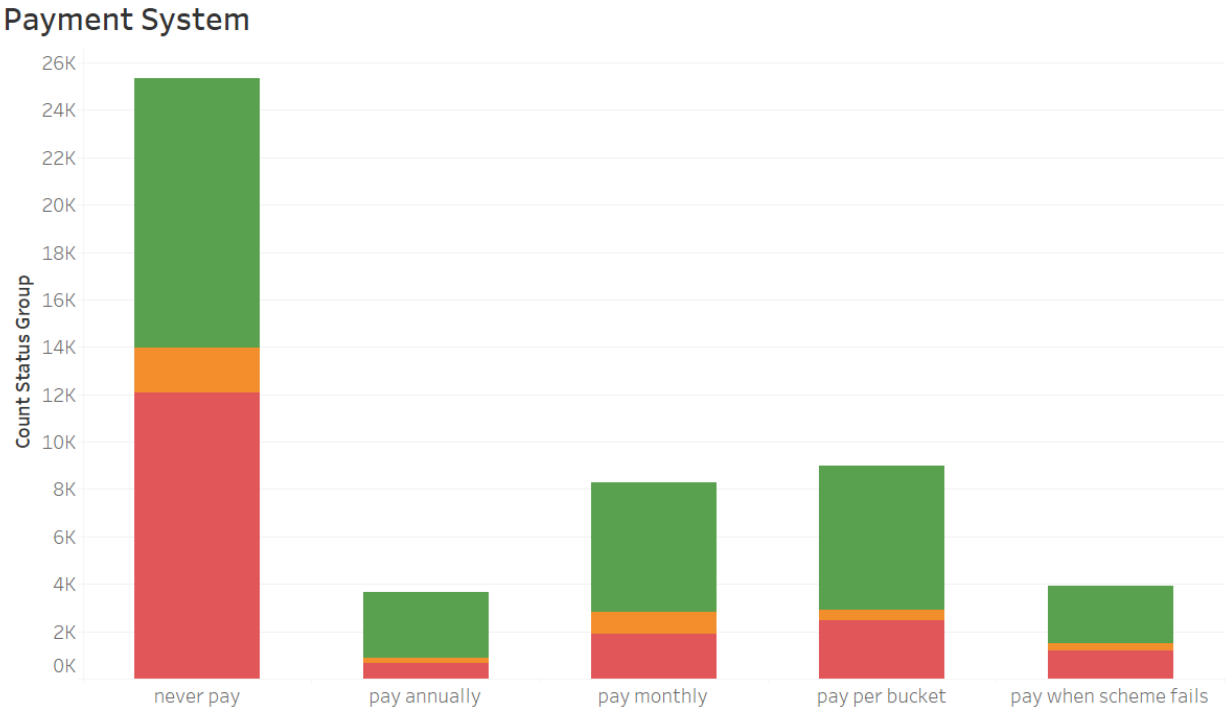
Private operators, minority contributor but the are doing the best job.

User-groups are doing a bigger bulk of work managing water points



#Paid or not paid?

If the water point management charges money, the more likely that it is better maintained and kept functional.



Predicting wich water points need to be repare?

#THE MODEL

Prediction:

Functional |Functional but needs repair |Not Functional Water Points

Multiclass Classification Model: Random Forest

The results

79% prediction accuracy .

64% accuracy of a correct prediction of the **minority class** (Not functional or need Repair)

Important features for the prediction:

Gps height (23%)
Years since construction (16%)
Population (14%)

#FUTURE STEPS
RECOMENDATIONS

Special focus on the **most vulnerable** water points.

Give **power to the people** enabling Local Management.

An effectiveness and efficiency infrastructure relays on **monitoring** Water Points status

Data is here to help!

#Better data for better predictions

THANK YOU!