

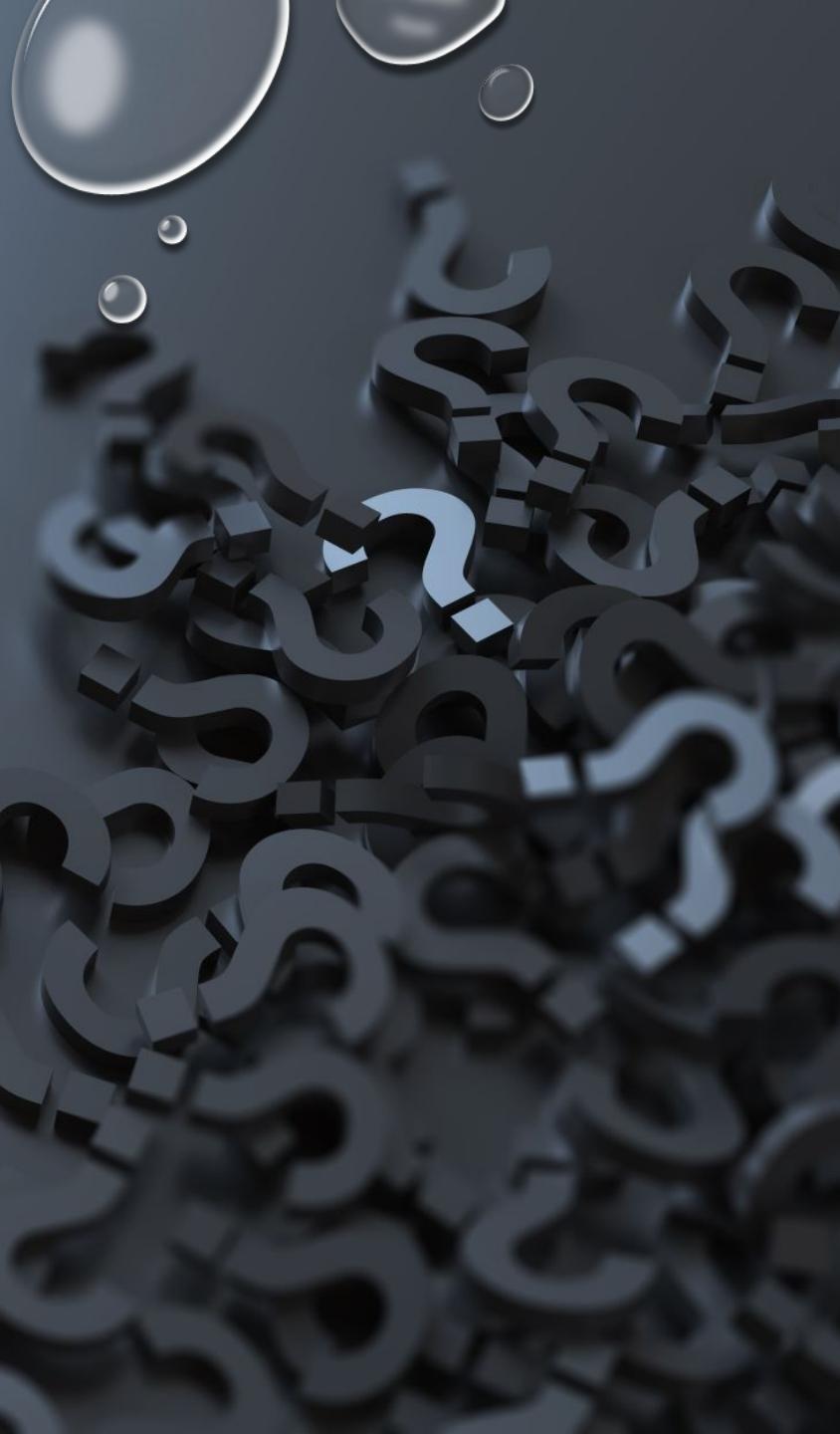


# TANZANIA WATER WELL

OUR CHILDREN DEPEND ON  
CLEAN RELIABLE WATER WELLS

# PROBLEM STATEMENT

- AMONGST MANY OTHER HARDSHIPS, DEVELOPING NATIONS TEND TO SUFFER FROM POVERTY, MALNOURISHMENT, AND LACK OF EDUCATION
- THE PURPOSE OF THIS MODEL IS TO ACCURATELY PREDICT FUNCTIONAL WATER WELLS, TO SUPPORT THE ABILITY OF LOCALS TO OBTAIN CLEAN RUNNING WATER.



## BUSINESS VALUE

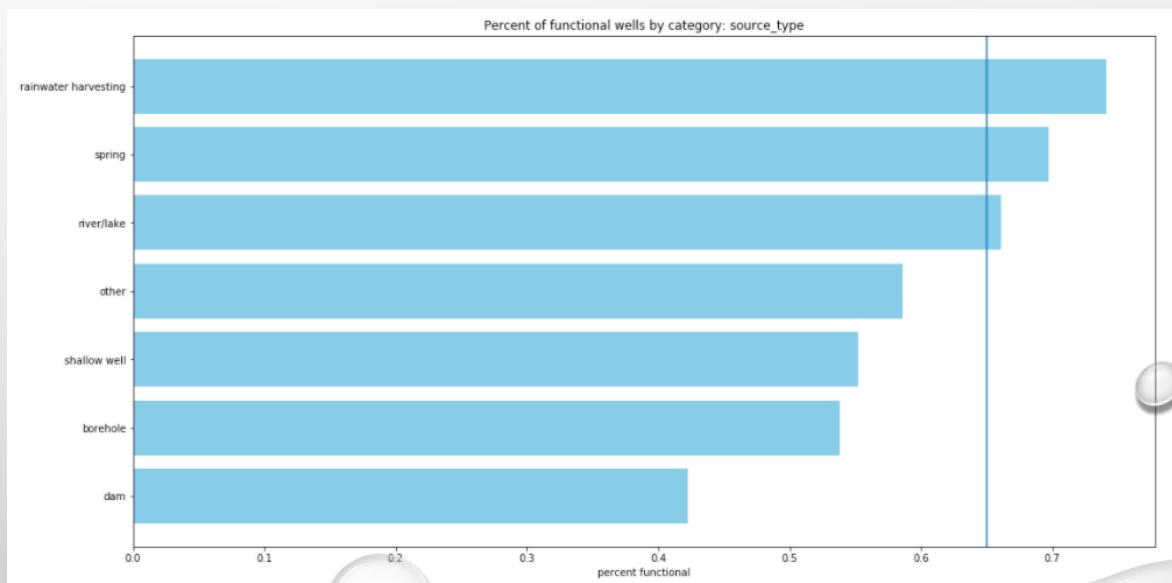
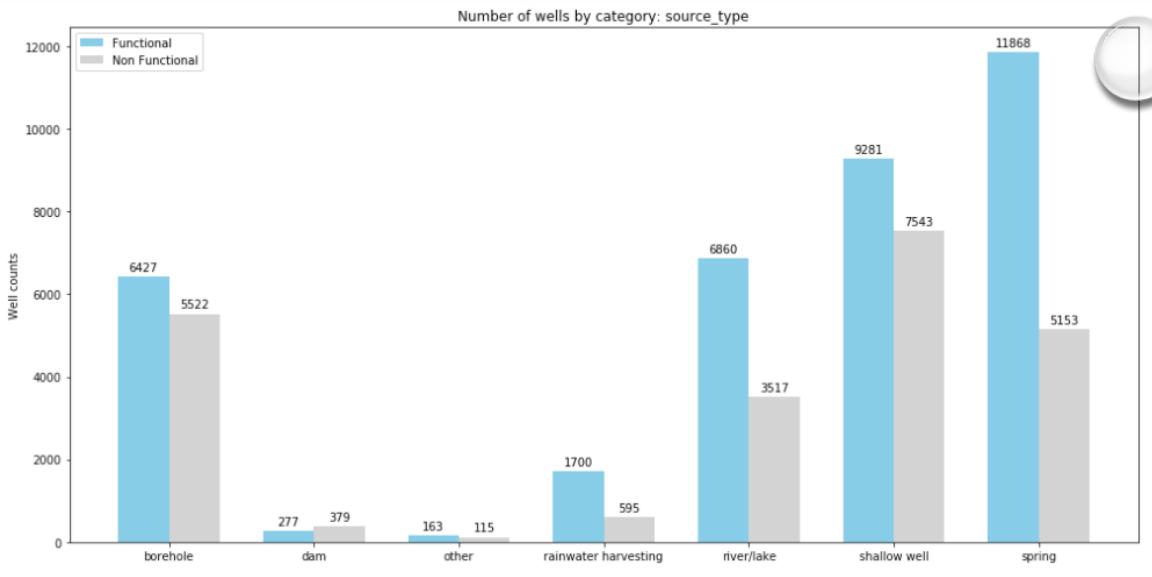
- HUMANITARIAN
- IDENTIFY WATER WELL FEATURES THAT HAVE HIGHER PROBABILITY OF FUNCTIONALITY FOR FUTURE PROJECTS
  - TO INCREASE WATER AVAILABILITY IN AREAS OF NEED
  - INCREASE LONGEVITY AND RELIABILITY OF WATER WELLS

# METHODOLOGY

- ANALYSIS OF CURRENT WATER WELL DATA TO UNDERSTAND KEY FEATURES OF FUNCTIONING WELLS
- SOME OF THE KEY FEATURES EXPLORED INCLUDE:
  - SOURCE OF WATER
  - PAYMENT OF WATER WELL
  - AGE OF WATER WELL
  - REGION

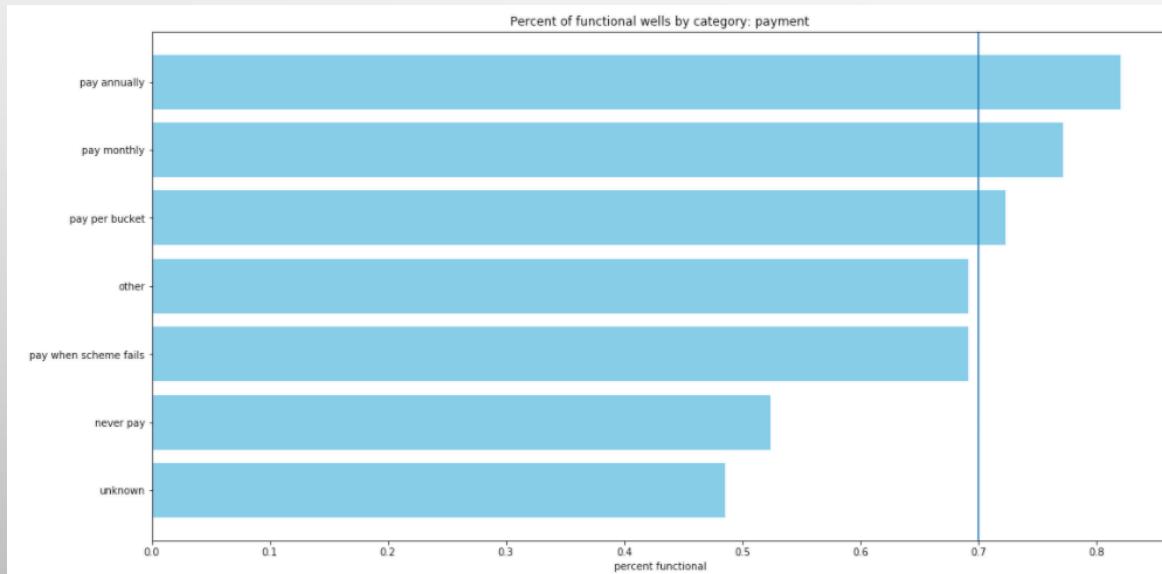
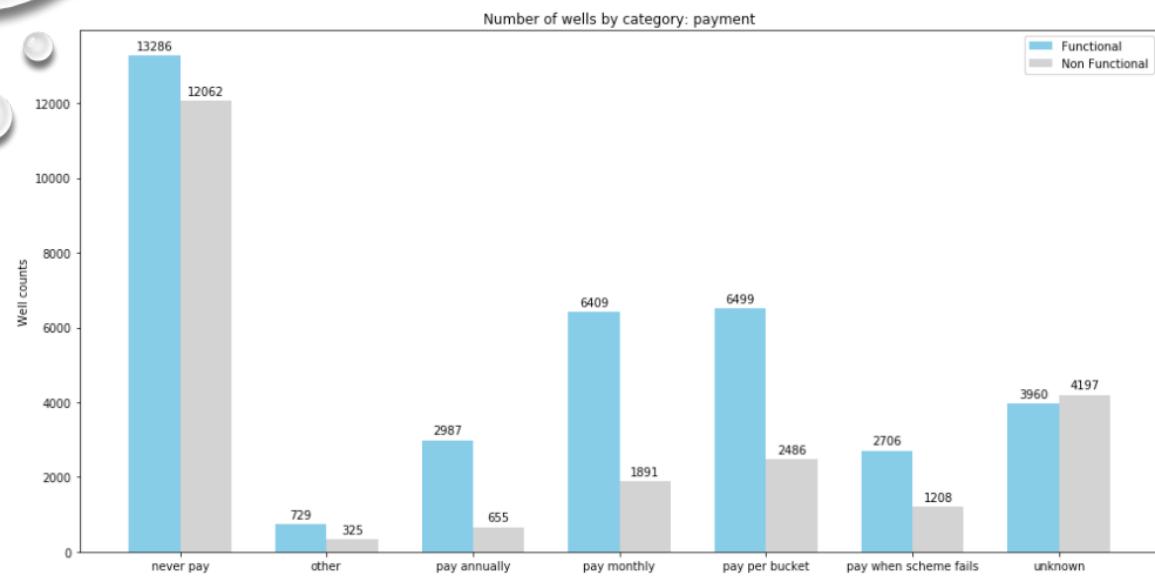
# WATER SOURCE

- RAINWATER HARVESTING
- SPRING
- RIVER / LAKE



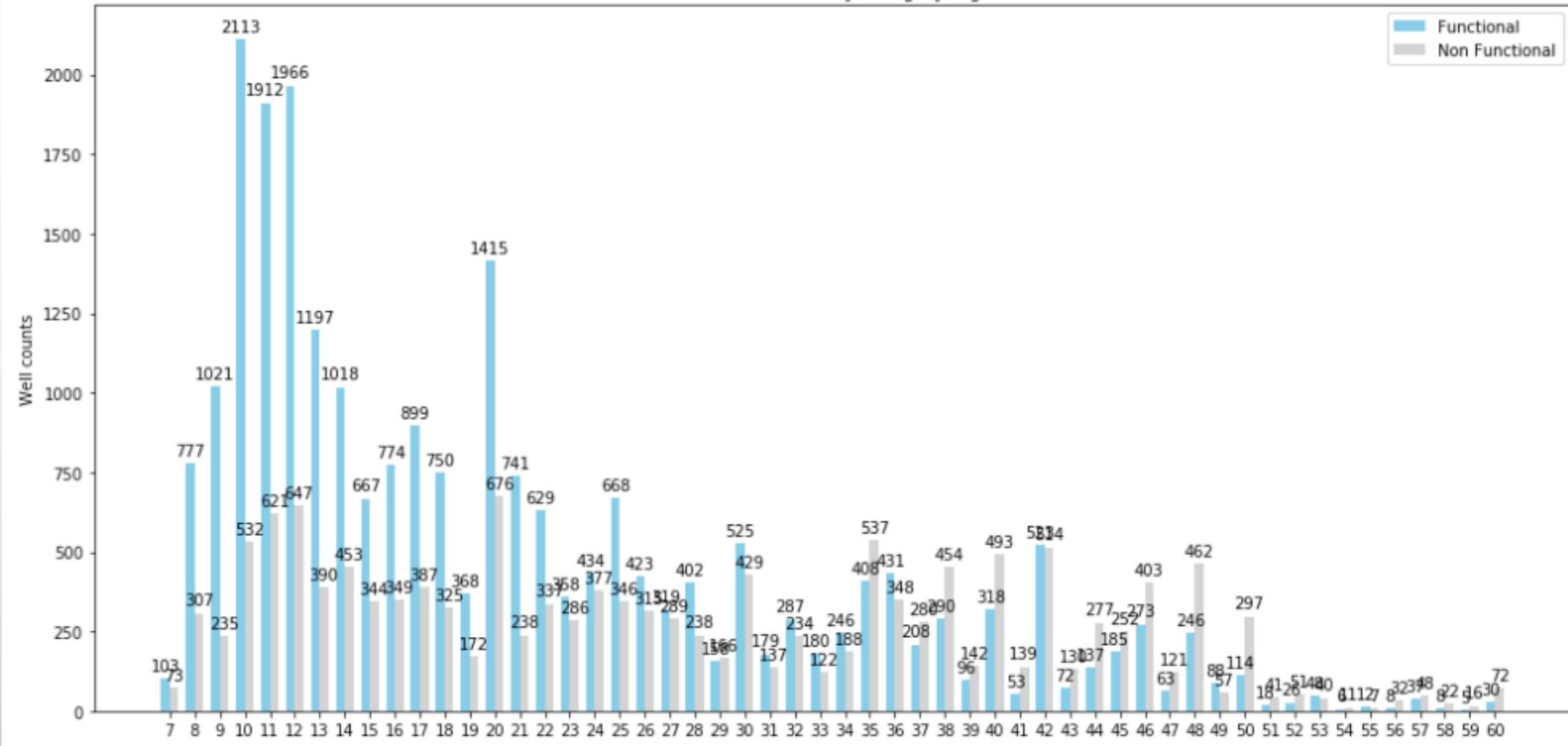
# PAYMENT

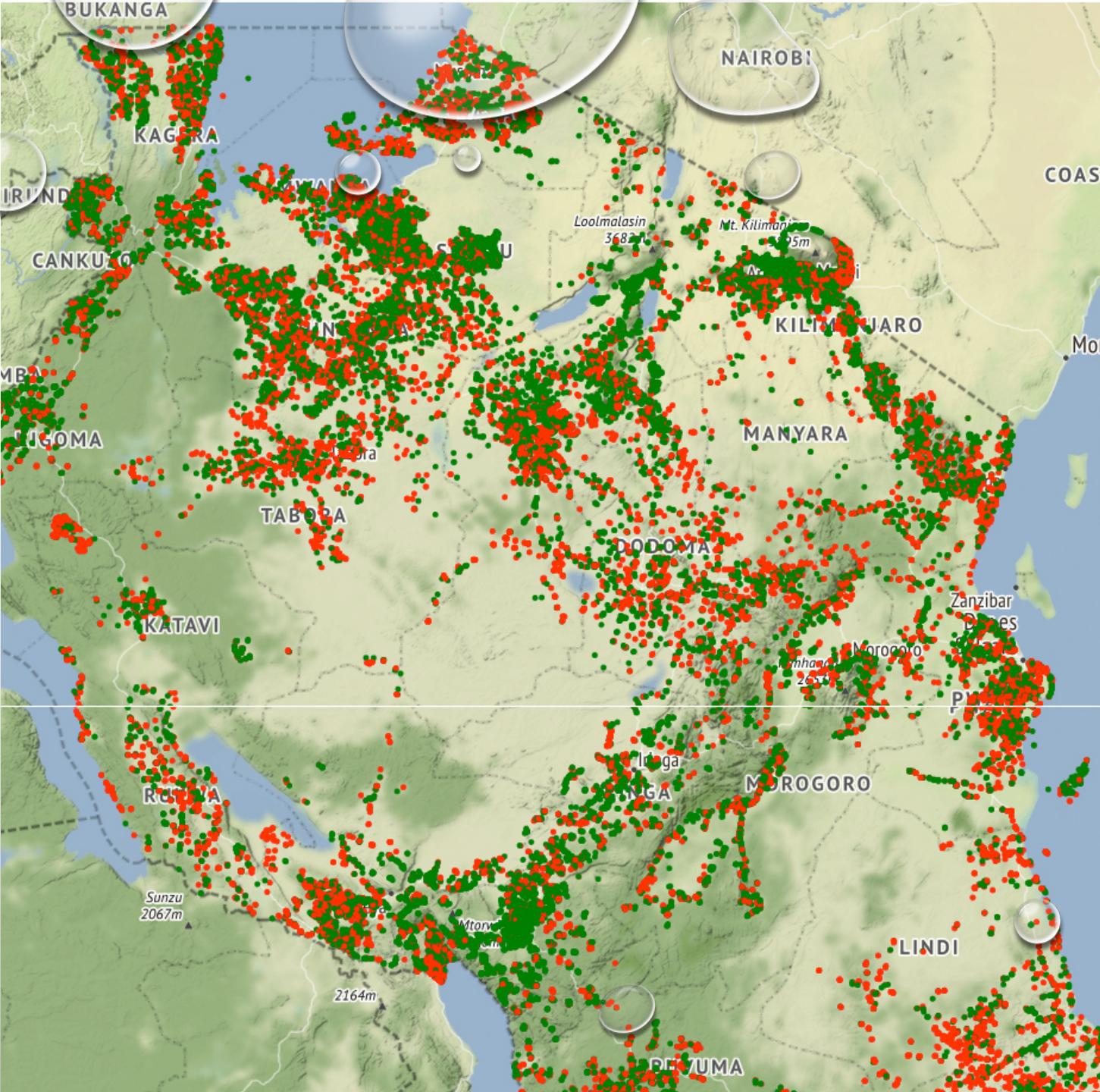
- ANNUALLY
- MONTHLY
- PER BUCKET



# AGE

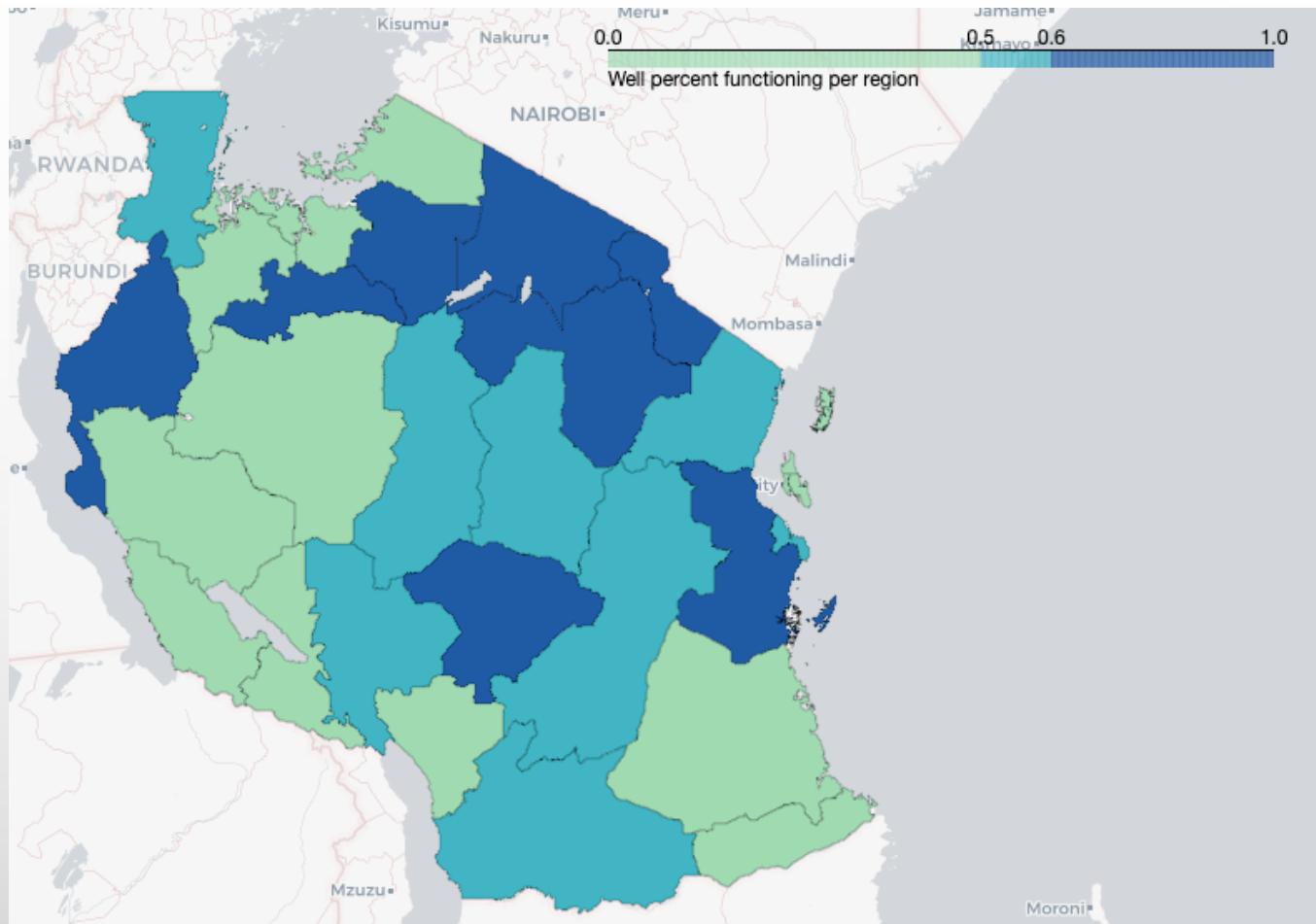
Number of wells by category: age





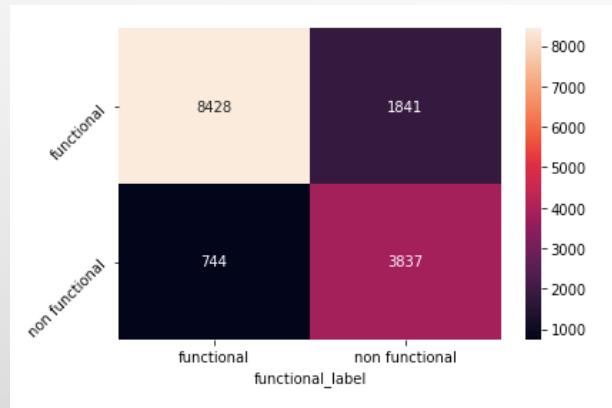
# REGION

# WATER WELL RELIABILITY PER REGION



# RESULTS

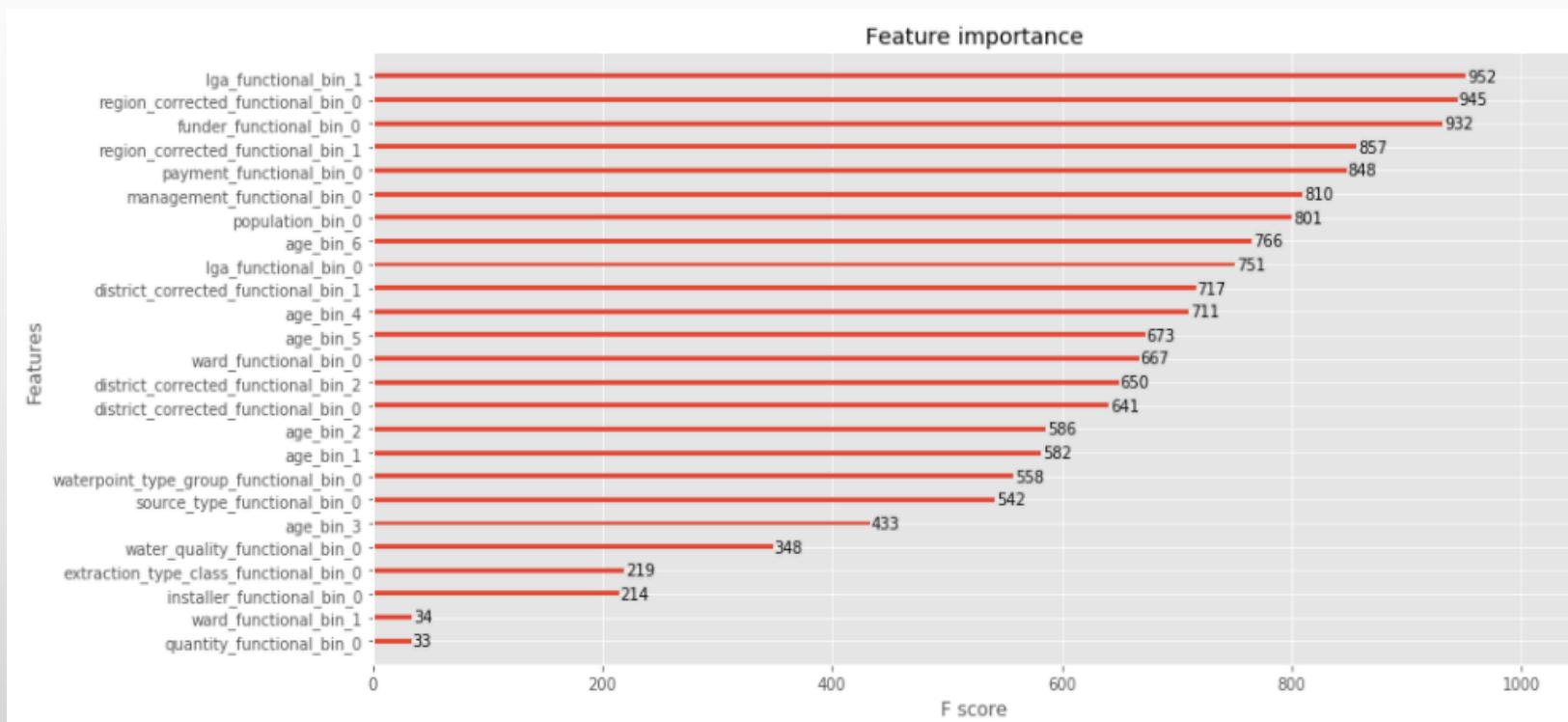
- XGBOOST MODEL USED TO PREDICT FUNCTIONING WATER WELLS
  - TRAINING SET SCORE FOR SVM: 0.838361
  - TESTING SET SCORE FOR SVM: 0.825926
- CONFUSION MATRIX



	precision	recall	f1-score	support
functional	0.82	0.92	0.87	9172
non functional	0.84	0.68	0.75	5678
accuracy			0.83	14850
macro avg	0.83	0.80	0.81	14850
weighted avg	0.83	0.83	0.82	14850

- HIGH FUNCTIONAL RECALL OF 0.92!

# SUMMARY



- TOP KEY FEATURES USED TO DETERMINE IF A WATER WELL IF FUNCTIONAL ARE:
  - LGA
  - REGION
  - PAYMENT
  - MANAGEMENT
  - POPULATION
  - AGE



## FUTURE CONSIDERATIONS

- IMPROVING MODEL ACCURACY:
  - INTRODUCING EXTERNAL DATA TO THE DATASET
    - CITY DATA - LOCATION, POPULATION
    - REGION POVERTY DATA
    - NATURAL DISASTER DATA – EARTHQUAKES, FLOODS, DROUGHTS
- MULTICLASSIFICATION MODEL:
  - TO PROVIDE FUTURE FINANCE ALLOCATION BY PREDICTING TIMEFRAMES A WELL MAY REQUIRE REPAIR



THANK YOU