

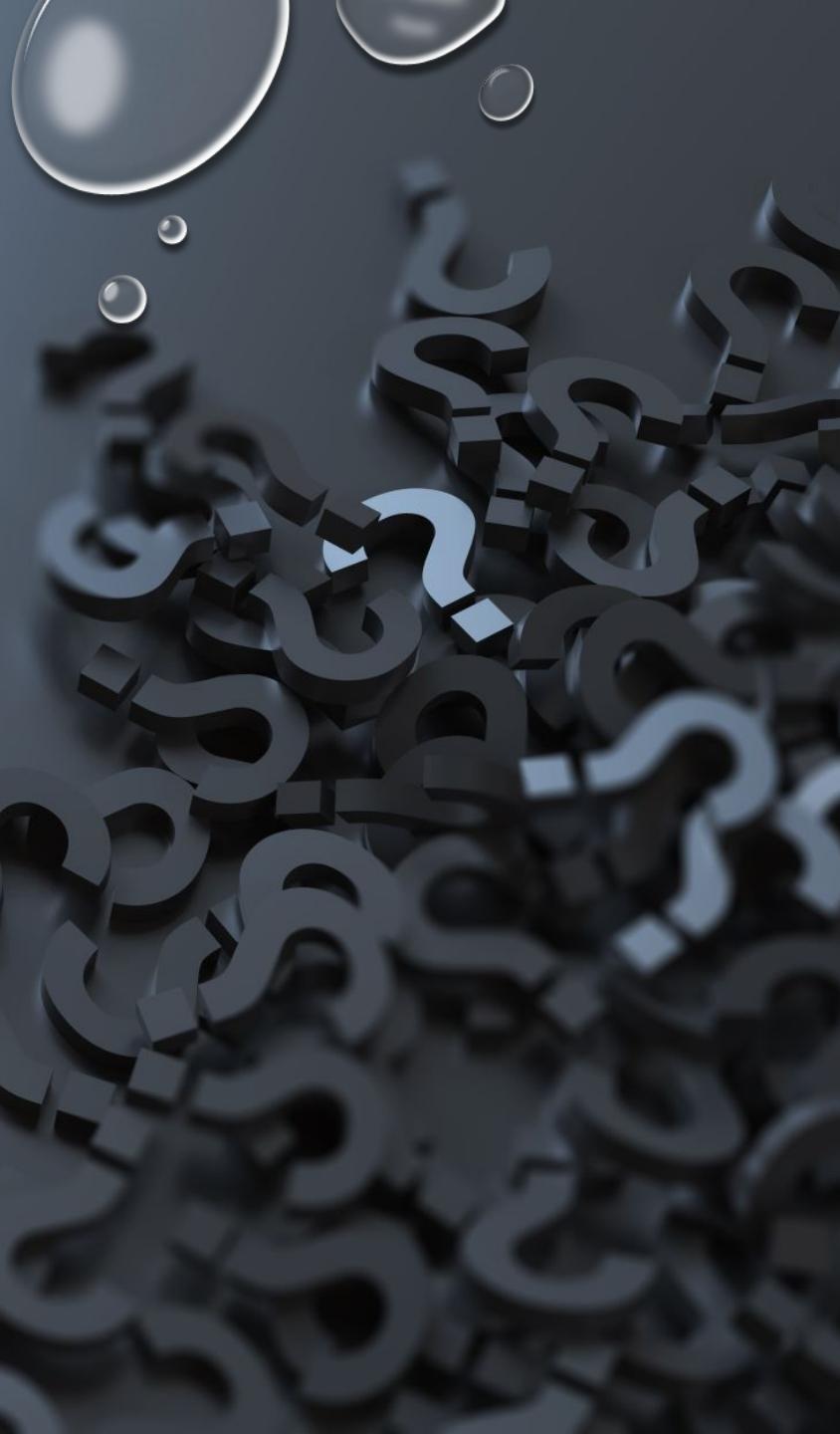


TANZANIA WATER WELL

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

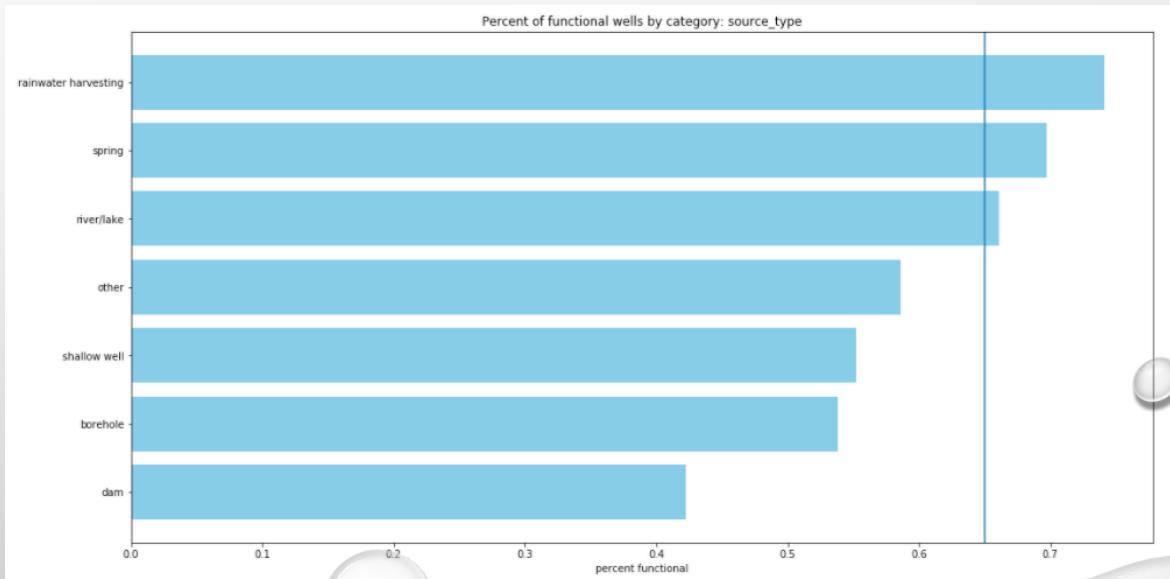
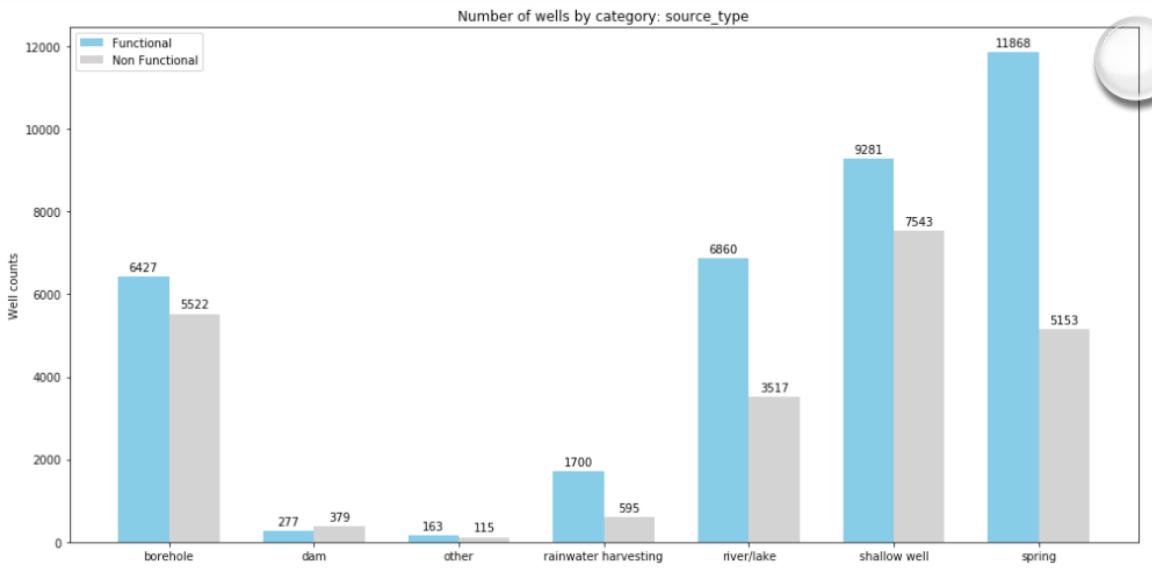
- HUMANITARIAN
- IDENTIFY WATER WELL FEATURES THAT HAVE HIGHER PROBABILITY OF FUNCTIONALITY FOR FUTURE PROJECTS
 - TO INCREASE WATER AVAILABILITY IN AREAS OF NEED
 - INCREASE LONGEVITY AND RELIABILITY OF WATER WELLS

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

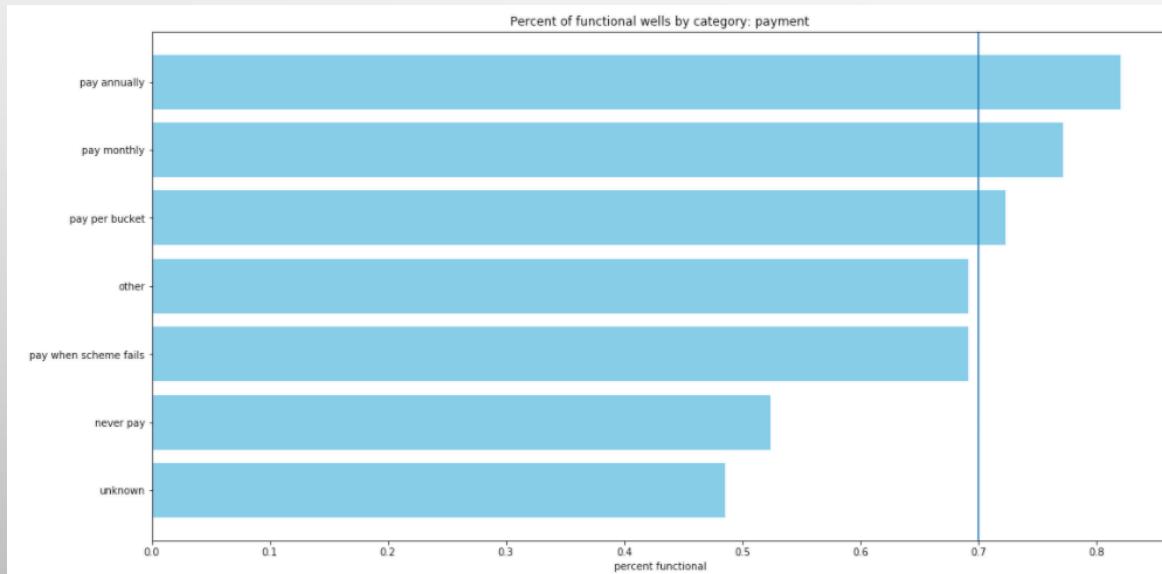
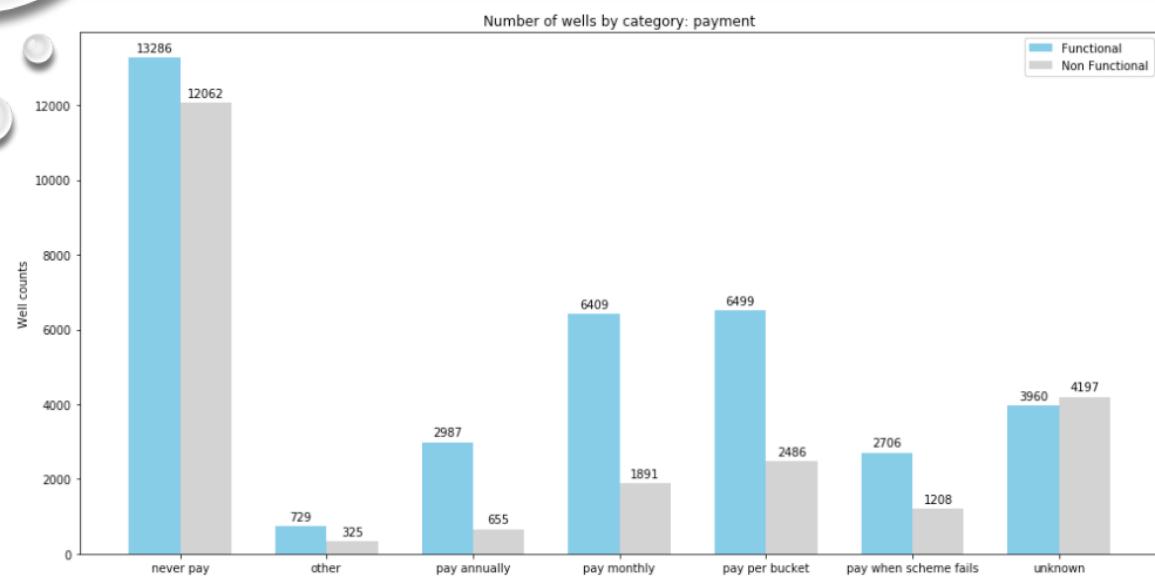
WATER SOURCE

- RAINWATER HARVESTING
- SPRING
- RIVER / LAKE



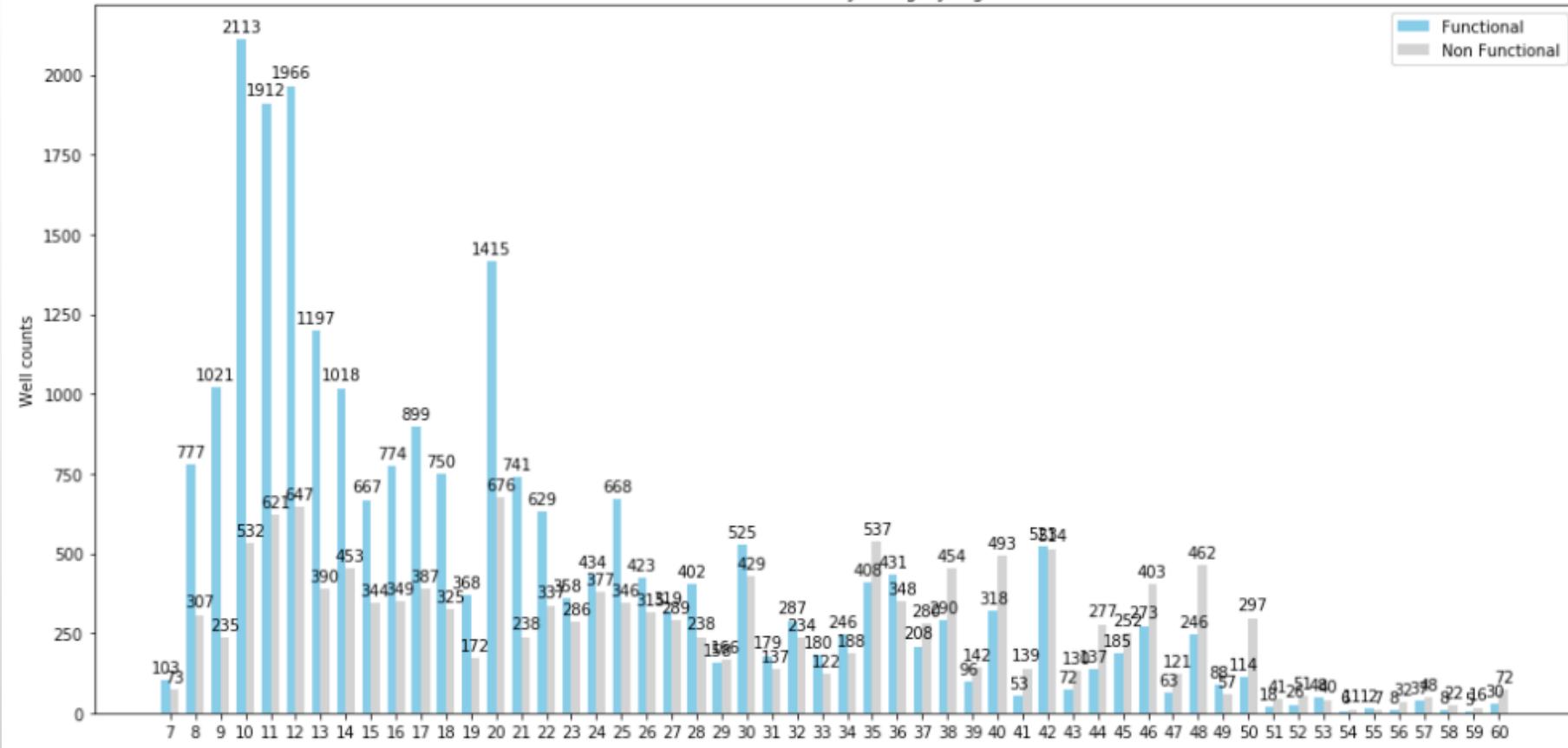
PAYMENT

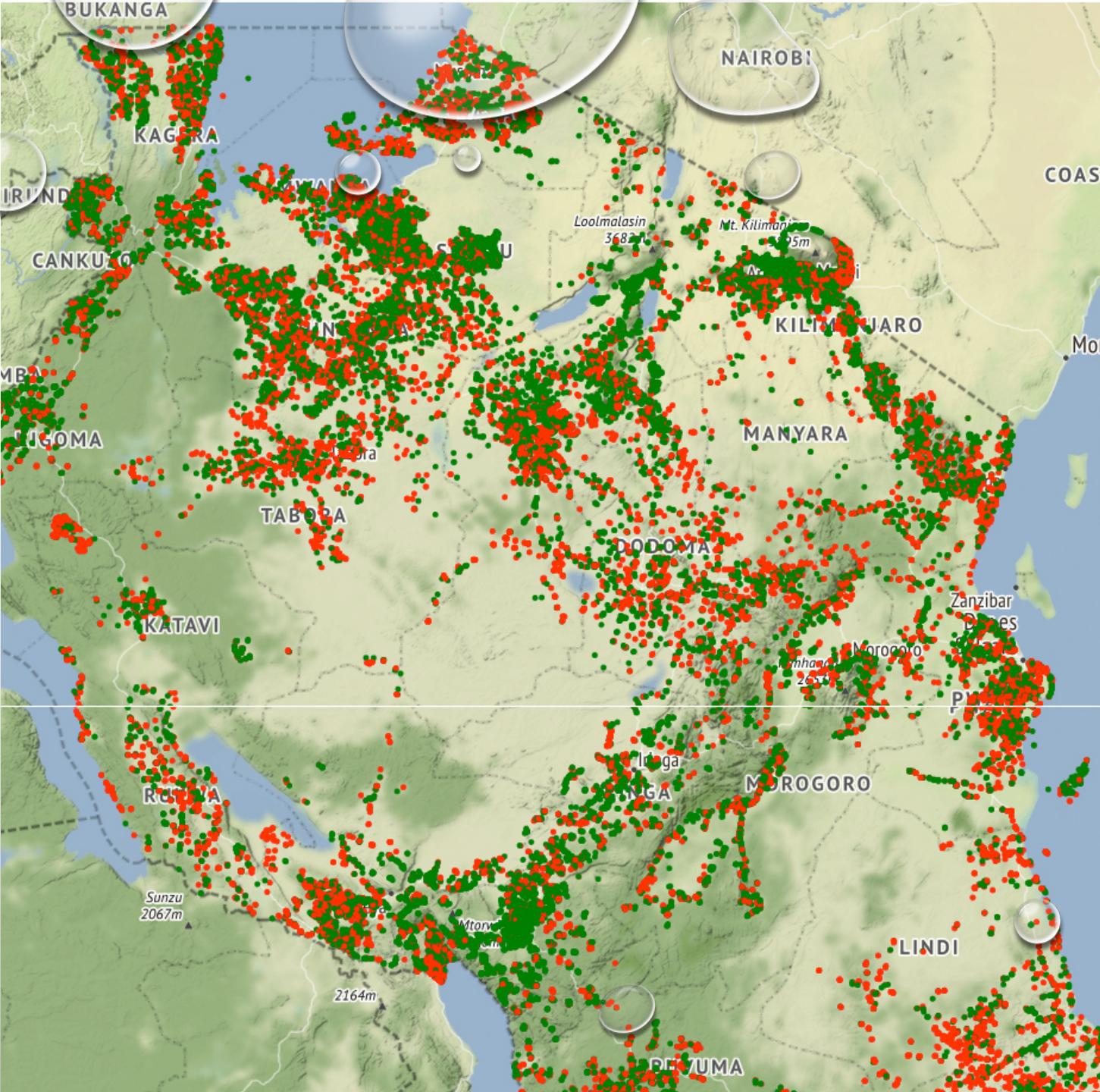
- ANNUALLY
- MONTHLY
- PER BUCKET



AGE

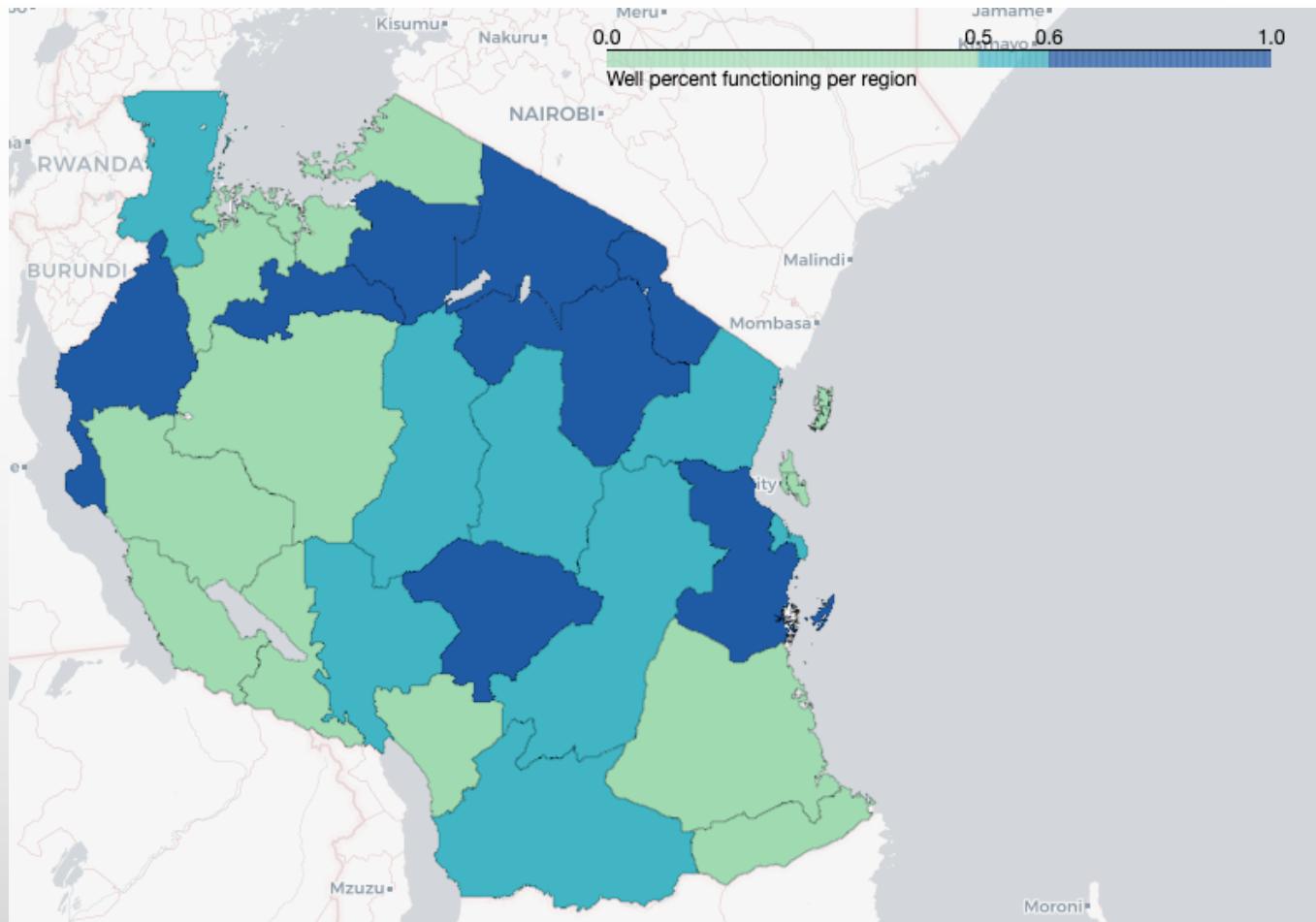
Number of wells by category: age





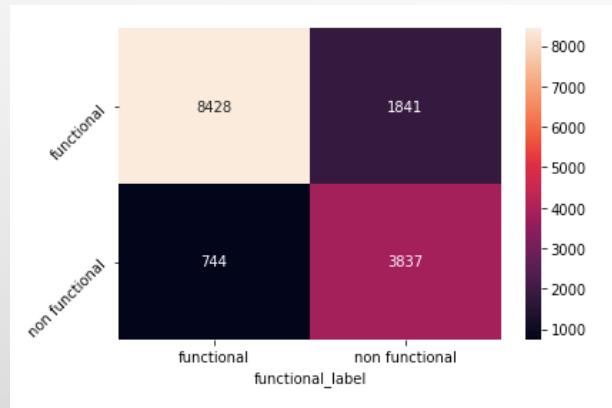
REGION

WATER WELL RELIABILITY PER REGION



RESULTS

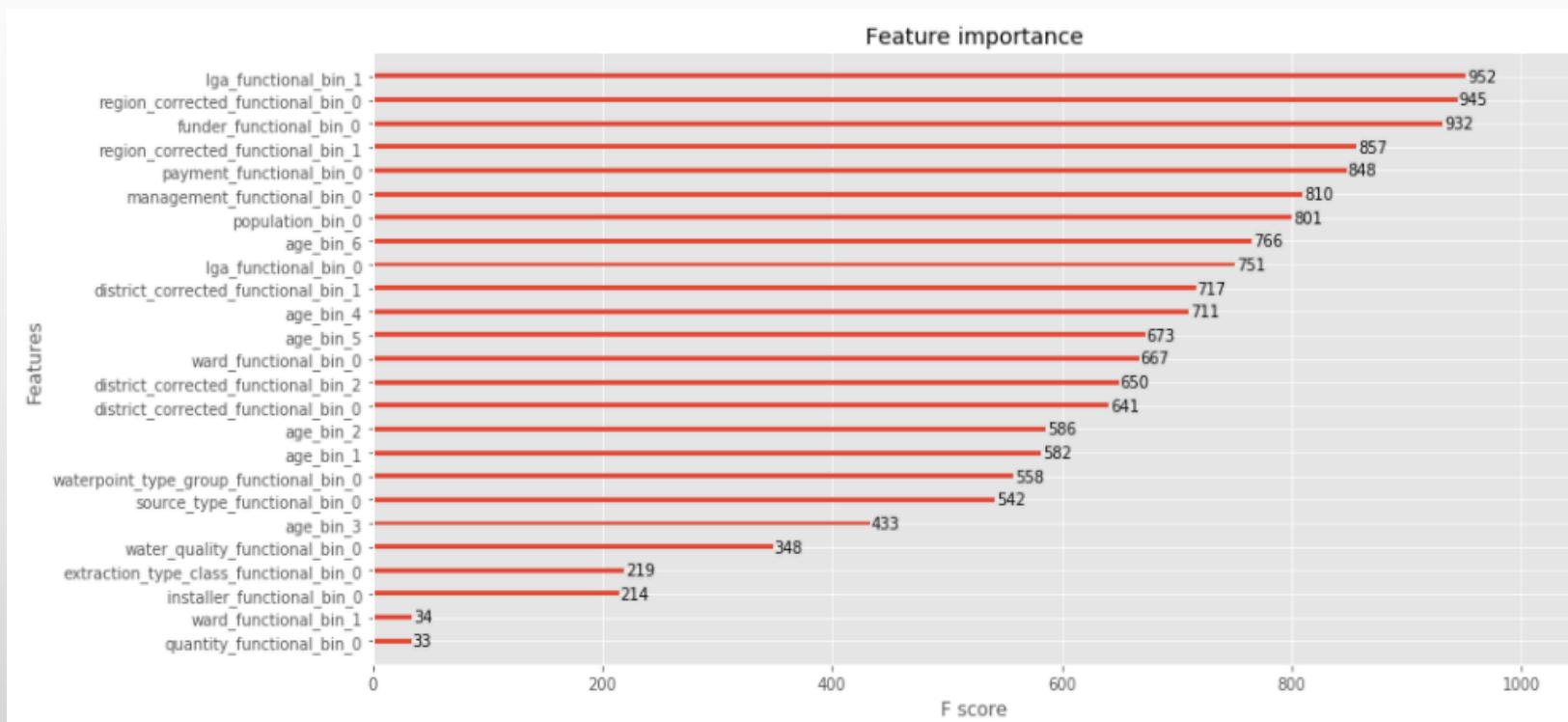
- XGBOOST MODEL USED TO PREDICT FUNCTIONING WATER WELLS
 - TRAINING SET SCORE FOR SVM: 0.838361
 - TESTING SET SCORE FOR SVM: 0.825926
- CONFUSION MATRIX



	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
 - FOR INCREASED SUCCESS OF FUTURE CONSTRUCTION PROJECTS



THANK YOU