

The background image shows a dry, arid landscape under a blue sky with scattered white clouds. In the foreground, there is a broken water well with a concrete and stone rim. A red rope is attached to a pulley system above the well. The ground is dry and dusty with sparse, low-lying vegetation. In the distance, there are rolling hills and mountains.

D/C Design and Analytics Investigates

A Broken System:

THE TANZANIAN WATER WELL CRISIS



OUR MISSION

To flag wells that requiring urgent maintenance without having to send a team to inspect the well. In doing so, we have the ability to reallocate resources to areas in need which, in turn, saves us critical financial aid to an already impoverished region. We will be able to minimize the downtime of wells which means more people have more reliable water.

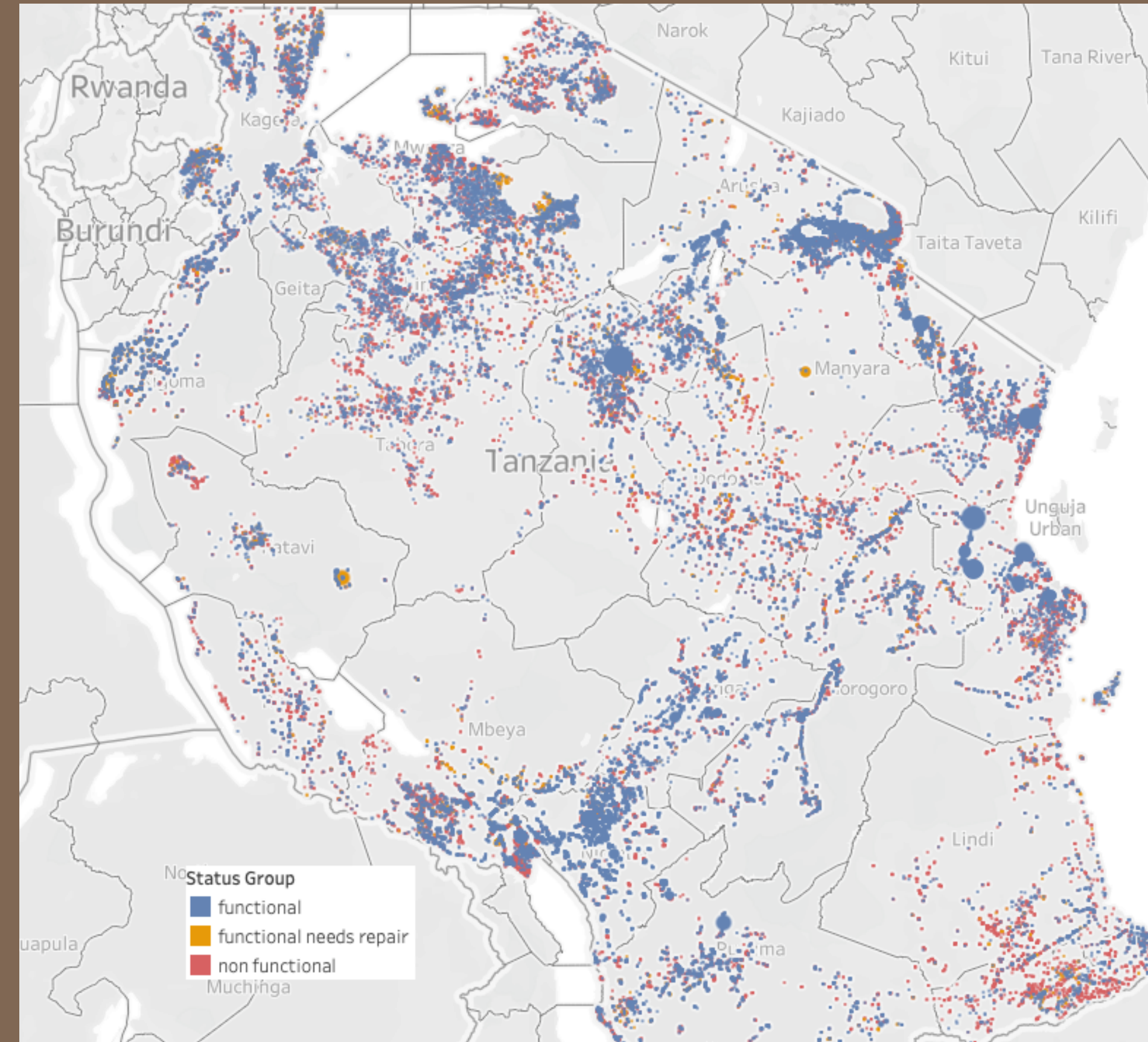
Minimization of false positives leading to a village or ward that is underserved.

Tanzania's Water Problems Go Beyond Provincial Borders

Poor drainage systems and insufficient capacity for water storage - only 50% of the Tanzanian population have access to safe water (and is **decreasing**)

Across the country, many areas are arid or semi-arid

People living in these communities have to walk long distances to collect water, *a job which generally falls to women and girls and puts them at risk of rape, assault and attack*



Tanzanian Earning Potential and Wages

- Average Worker Earns ~\$105 -108 per month
- Basic nutritional needs are barely covered
- We have identified waterpoints that are pay-per-container
- To Drill: 60,000 TS (\$26.04 USD)
- Annual Maintenance and Fees 100,000 TS (\$43.39 USD)

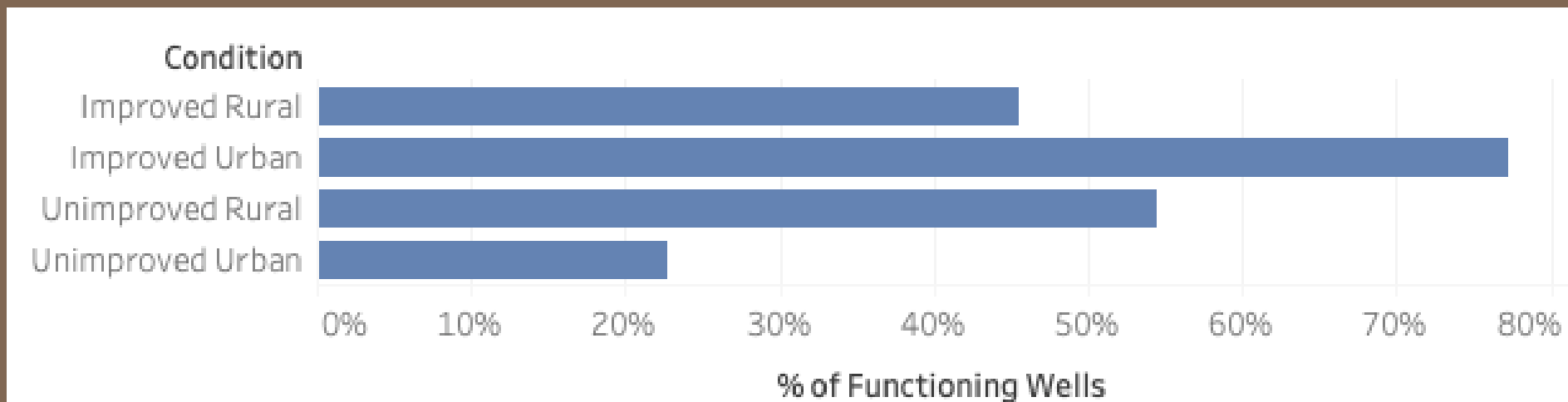
**10,000 Tanzanian Shillings (TS)
is roughly \$4.34USD**

Source: Living Wage Series
AllAfrica.com





Tanzania's Water Distribution Crisis



Source: CIA World Factbook

Waterborne Illnesses are a Dangerous Threat to Tanzanians

DEGREE OF RISK: **VERY HIGH**

- **Food or *waterborne* diseases:** *bacterial diarrhea, hepatitis A, and typhoid fever*
- Vectorborne diseases: ***malaria***, dengue fever, and Rift Valley fever
- ***Water contact* diseases:** *schistosomiasis and leptospirosis*
- Animal contact diseases: rabies

Source: CIA World Factbook

What We Looked At

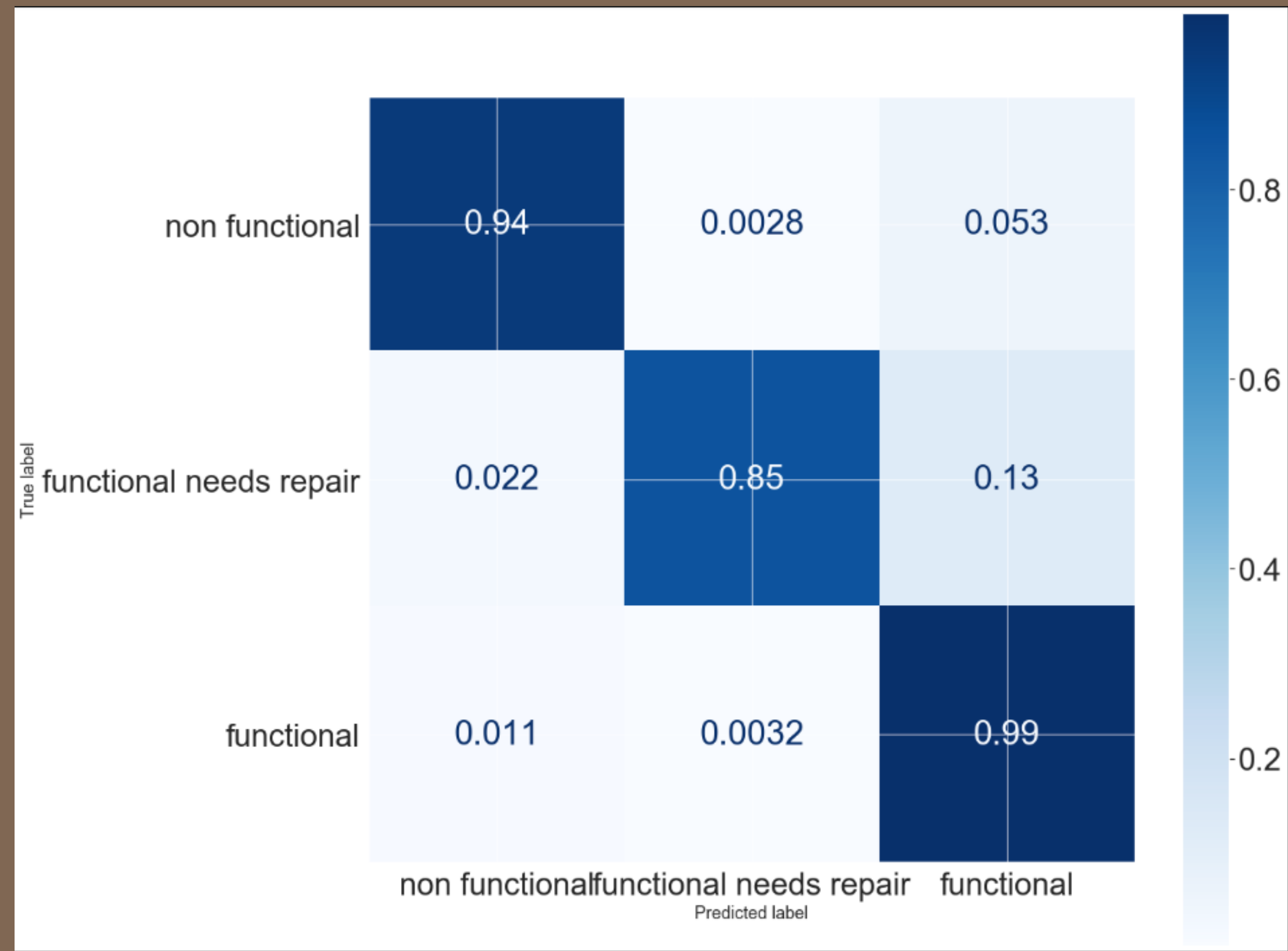
- Existing Well Data
- Whether the well was Functioning, In Need of Repair, or Non-Functioning
- Water Quality of Existing Wells
- Seasonality of Functioning Wells
- Regional Analysis

What We Found

- High correlation between type of well and water quality for wells
- Extraction Type
- Method of Payment for Well
- Regional (Lat/Long, Geographical Region) datapoints show the most important correlations



Minimization of False Positives to Provide Efficient Waterpoint Access



To prevent erroneously sending teams to repair wells, our model minimizes the number of 'false positives' (where wells are labeled by the model as 'Non-Functioning' despite being a 'Functioning' well)

We call this our 'deficiency' rate, which is currently hovering at 1.1%

Conclusions and Questions

BEST	CURRENT RANK	# COMPETITORS
0.8184	658	8281

- Accuracy of 82%/Top 8% of Competition
- Continued Hyperparameter Tuning
- Focus On/Improvement of Deficiency Rate
- Finding Better Feature Interactions
- Continued Quality of Life Improvements for All Tanzanians
- Less 'On-The-Ground' Efforts
- Questions/Comments?