WaterAid in Tanzania

"Let's Get These People Water"

WaterAid

Table of contents

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Business Problem

16 million [1]

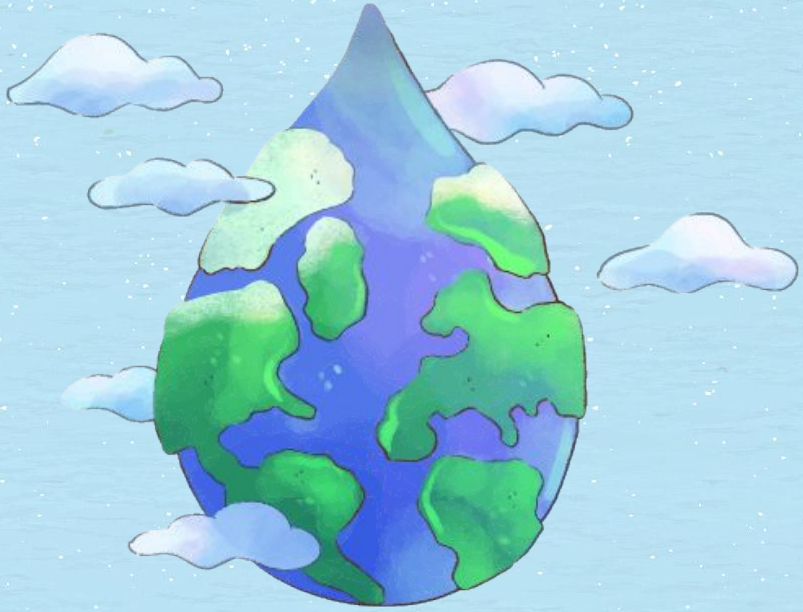
People without clean water

4 thousand [2]

Children under 5 die each year from preventable water-borne illness

70% [3]

Health budget spent on WASH-related diseases



1. Water.org (https://water.org/our-impact/where-we-work/tanzania/), 2. WaterAid (https://www.wateraid.org/us/where-we-work/tanzania)
3. Unicef (https://www.unicef.org/tanzania/what-we-do/wash)

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Approach

Data

59k+ Wells

Status

1. Working
2. Not Working
3. Working but Needs Repair

Features

40 features like:

- Location
- Management
- Year Built

Predict?

Using Machine Learning

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Modeling

	Training Accuracy	Testing Accuracy	Testing Log Loss	"Functional" Recall	"Non-Functional" Recall	"Needs Repair" Recall
Dummy	54.2%	54.5%	15.70	100%	0%	0%
Simple LogReg	76.7%	75.9%	0.58	88.1%	69.5%	17.1%
Polynomial	76.4%	75.5%	0.58	87.9%	69.2%	15.1%
SMOTE	67.8%	66.3%	0.74	**64.4%**	68.2%	**70.4%**
Grid Search LogReg	76.7%	76.0%	0.58	**88.5%**	69.5%	**15.8%**

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Evaluation – Logistic Regression

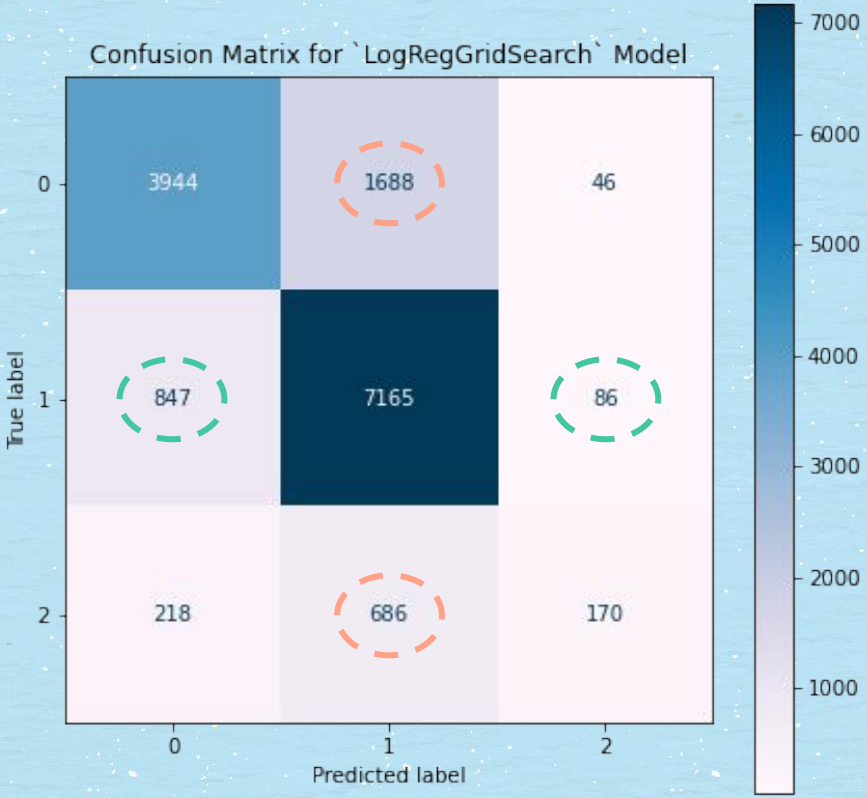
0: *Non-Functioning*
1: *Functioning*
2: *Needs Repair*

Positive: *Needs Attention (0 or 2)*

Negative: *No Attention Needed (1)*

False Positives ➪
Waste resources

False Negatives ➪
People in need



More Efficient

False Positives: 933

Less Safe

False Negatives: 2,374

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Evaluation – LogReg with SMOTE

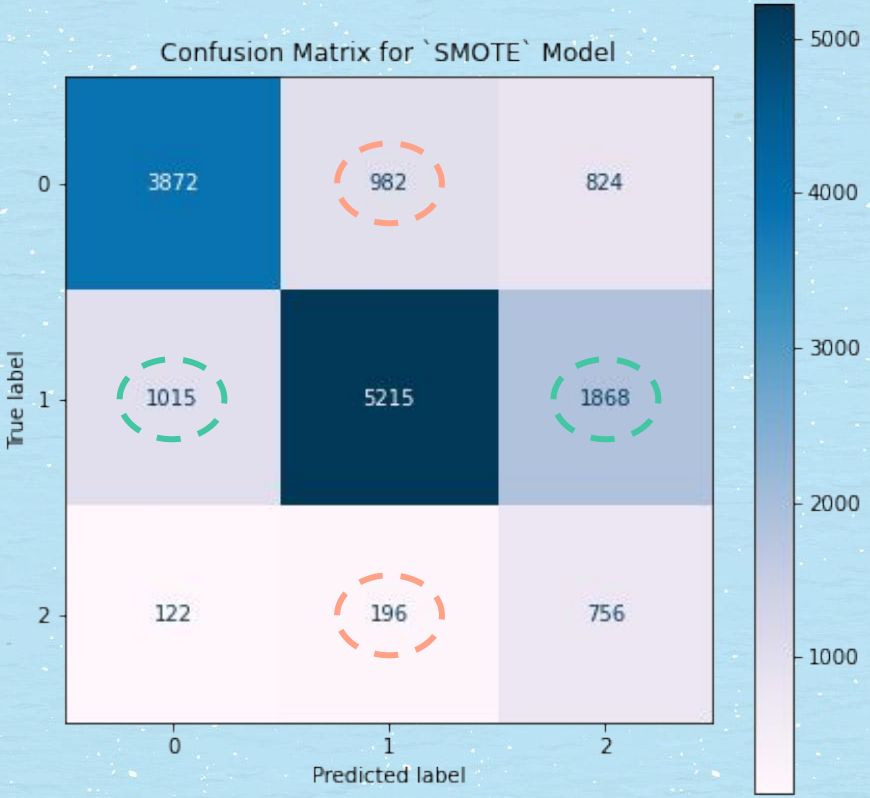
0: *Non-Functioning*
1: *Functioning*
2: *Needs Repair*

Positive: *Needs Attention (0 or 2)*

Negative: *No Attention Needed (1)*

False Positives ➪
Waste resources

False Negatives ➪
People in need



Less Efficient

False Positives: 2,883

Safer

False Negatives: 1,178

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Conclusion

What's our priority?

Efficiency

Simple Logistic Regression

Safety

Logistic Regression with SMOTE

What can we afford?

Next Steps

Decision Tree?

K-Nearest Neighbors?

Random Forest?

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Thanks!

Do you have any questions?

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