TANZANIAN WATER WELLS

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OVERVIEW

- Tanzania has experienced significant economic growth over the years, however a significant proportion of its population remains without proper access to improved drinking water
- The country now faces a difficult task of meeting the Sustainable Development Goals (SDGs) to provide universal coverage of safe water by 2030.
- Estimates shows up to 44% failure of their water points which is the failure rate in Africa.

PROBLEM STATEMENT

- We have been tasked by World Bank Group together with the Government of Tanzania to seek a better understanding as to why water point failure is significantly higher in Tanzania as opposed to the rest of Africa
- Provide a way to reliably predict when water points shall fail as they tackle the difficult task of meeting their 2030 MDG goals in Environmental Sustainability .

OBJECTIVES

1. **Analyze the Impact of Age, Technology, and Investment on Water Point Failure**
2. **Assess the Impact of Socioeconomic and Geographical Factors**
3. **Develop a Predictive Model for Water Point Failure**

DATA UNDERSTANDING

- The data to be used within this exploratory analysis comes from a competition held by DRIVEN DATA
- The results that we sort are categorized into two:

I. **functional**: The water point is operational and there are no repairs needed

II. **non functional**: The water point is not operational

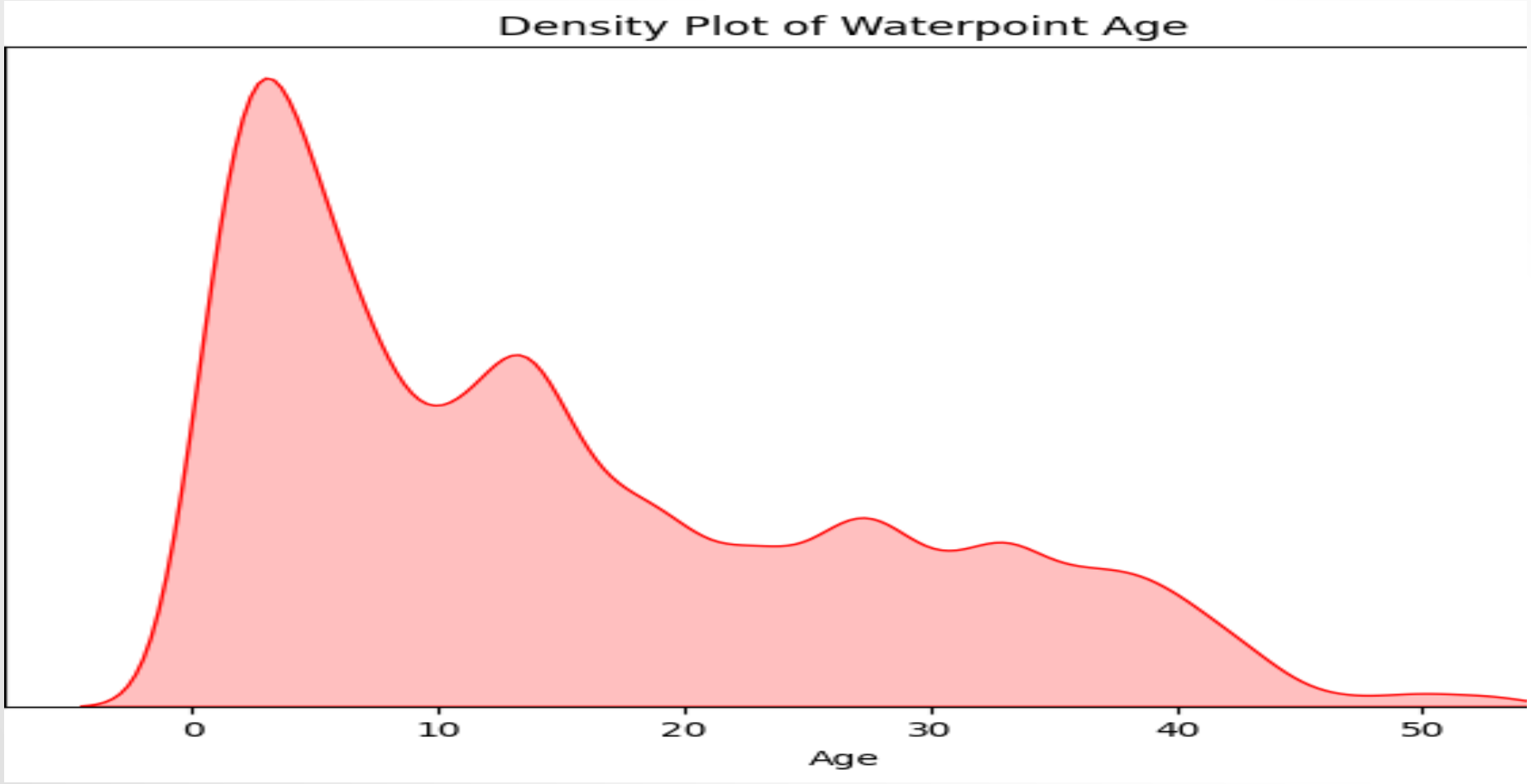
DATA ANALYSIS APPROACH

- Data Mining
- Data Cleaning
- Data Analysis and Visualization
- Modeling and Parameter Tuning
- Insights
- Recommendations

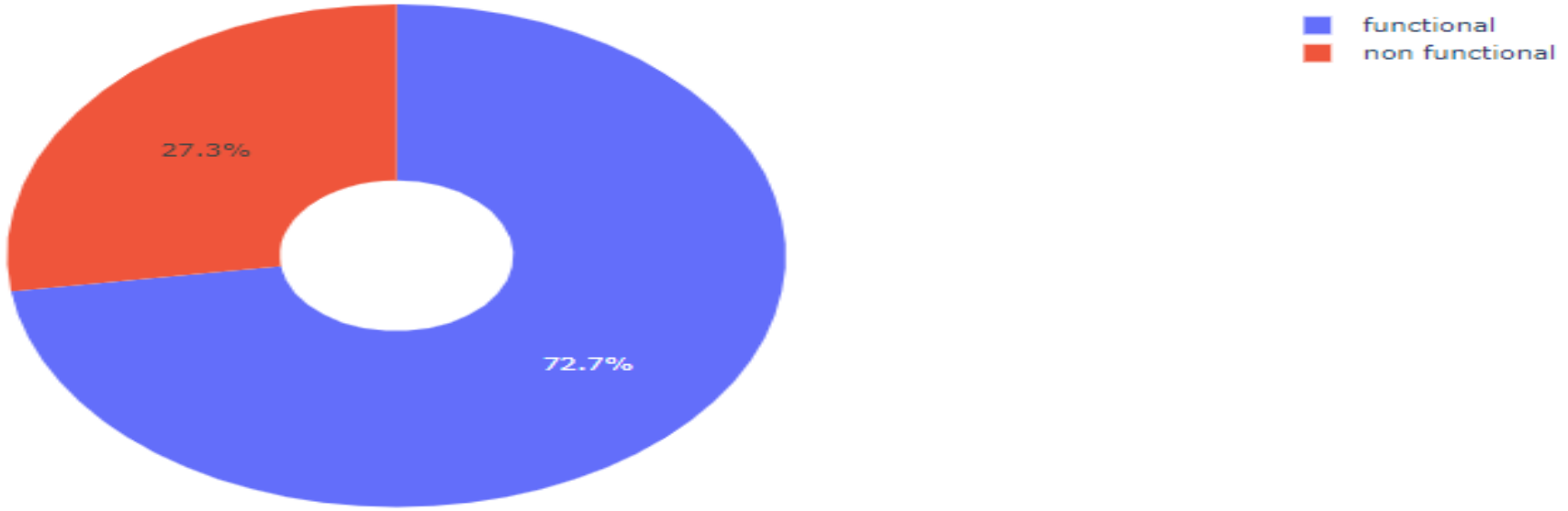
OBSERVATIONS AND RESULTS

AGE FACTORS

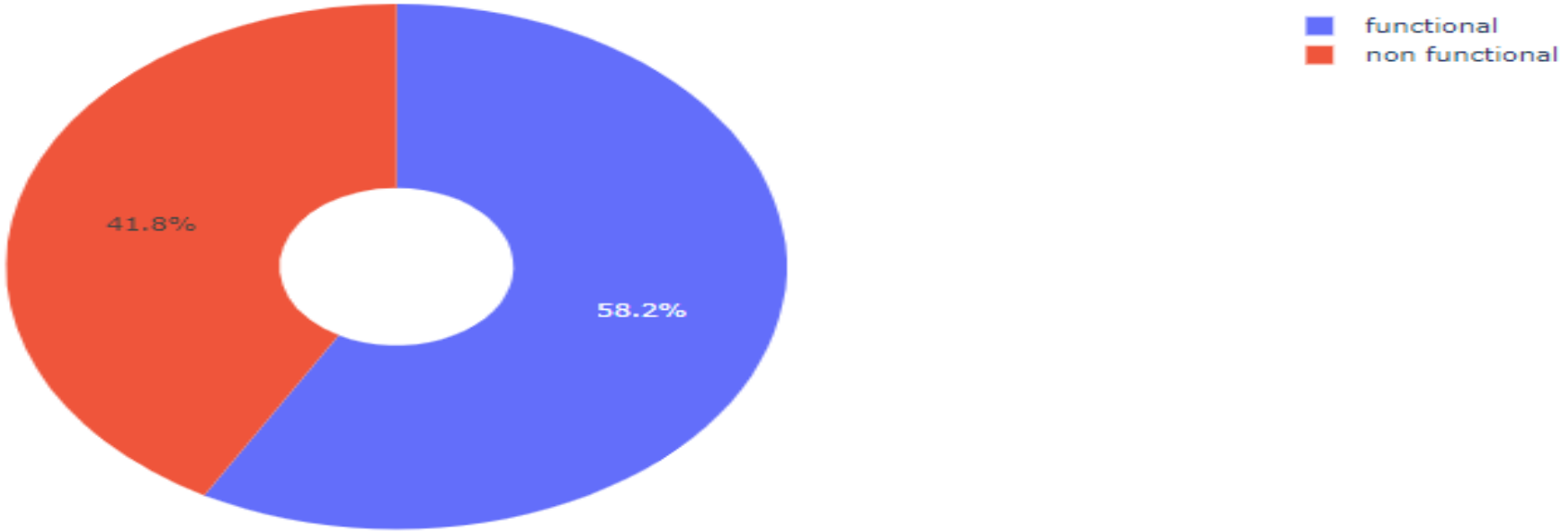
- Most Water Points Built in approximately the last 15 years



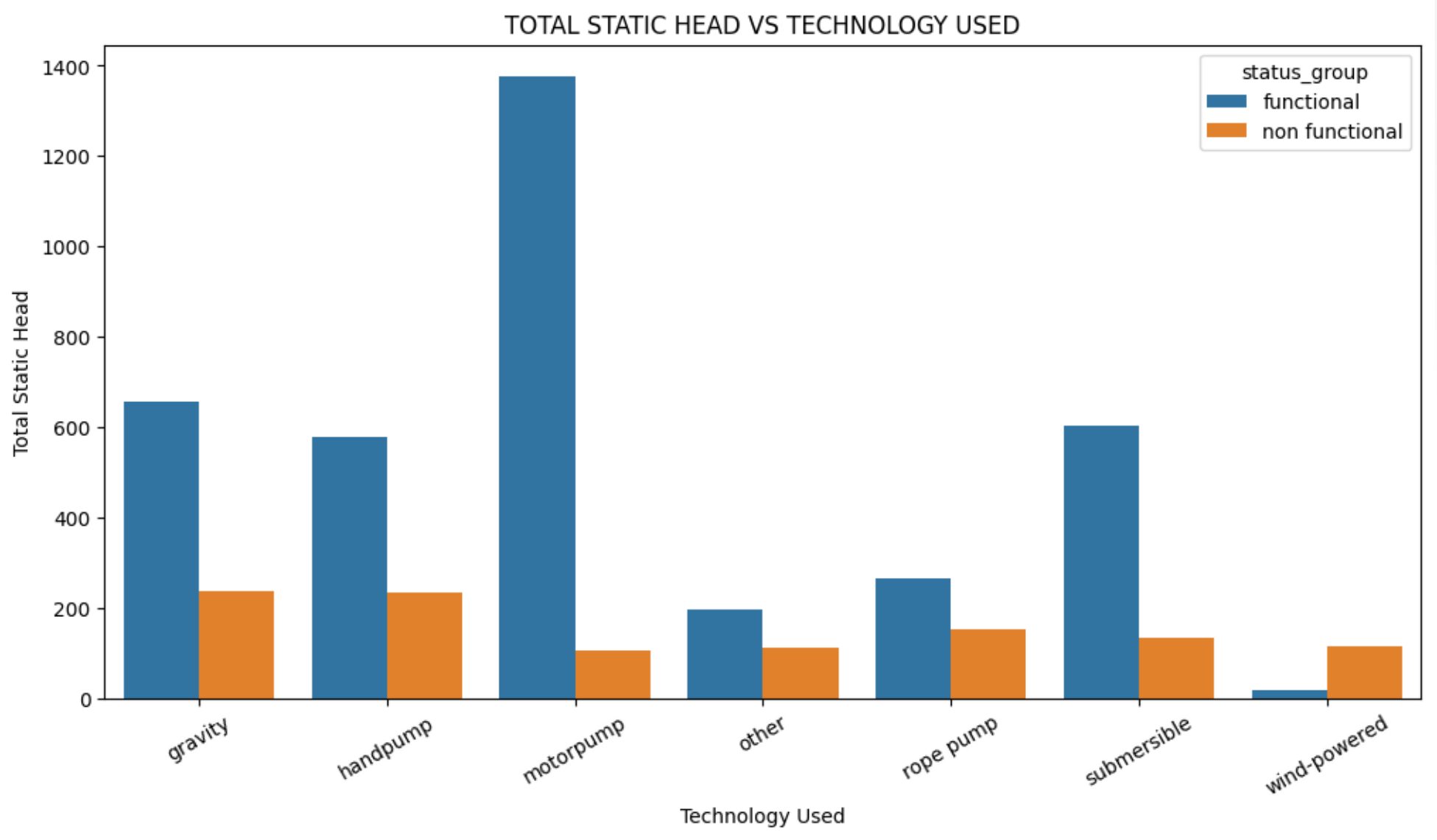
Proportion of Water Points Functional In The Last 15 Years



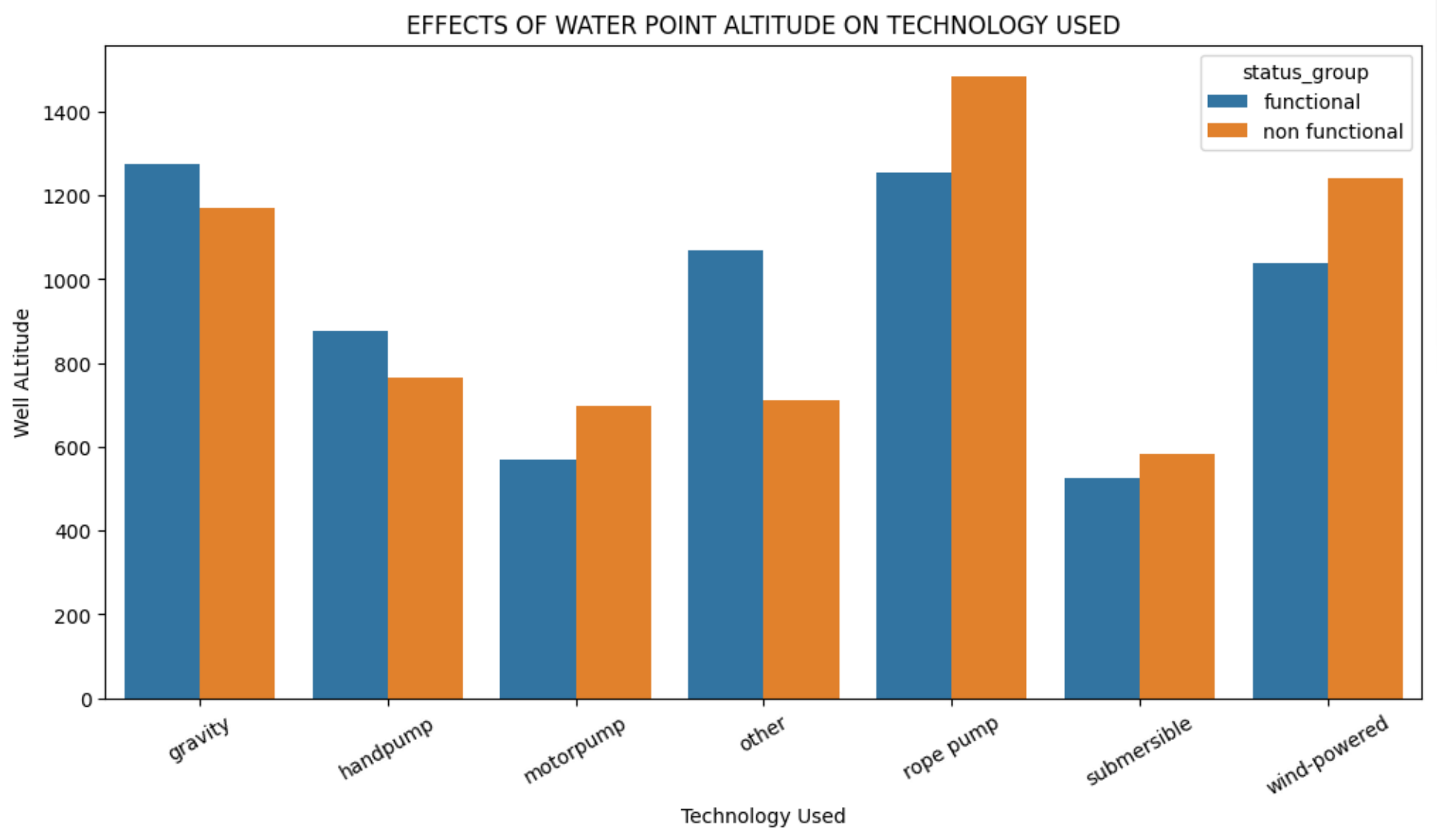
Proportion of Water Points Functional In Between 15-25 years

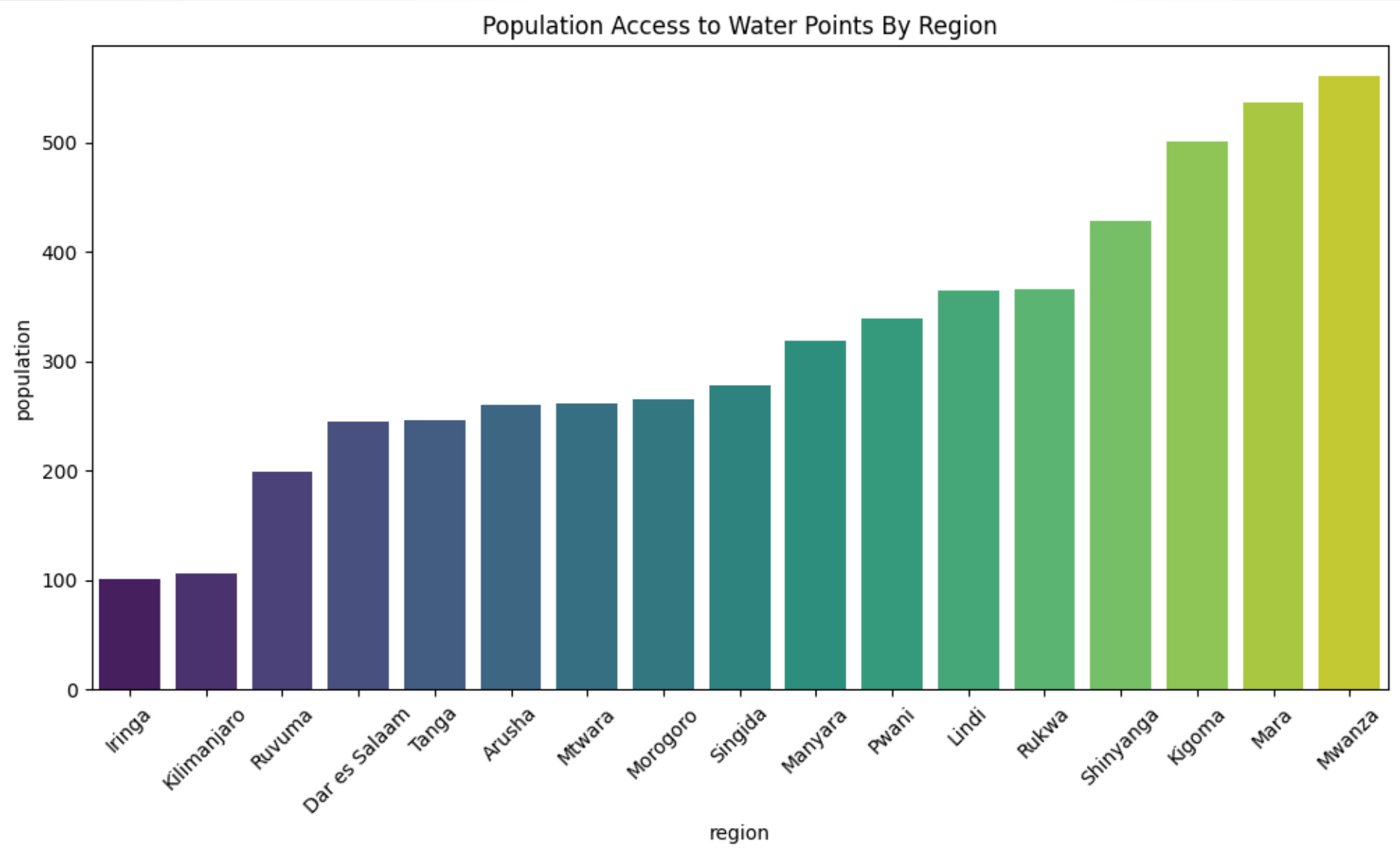


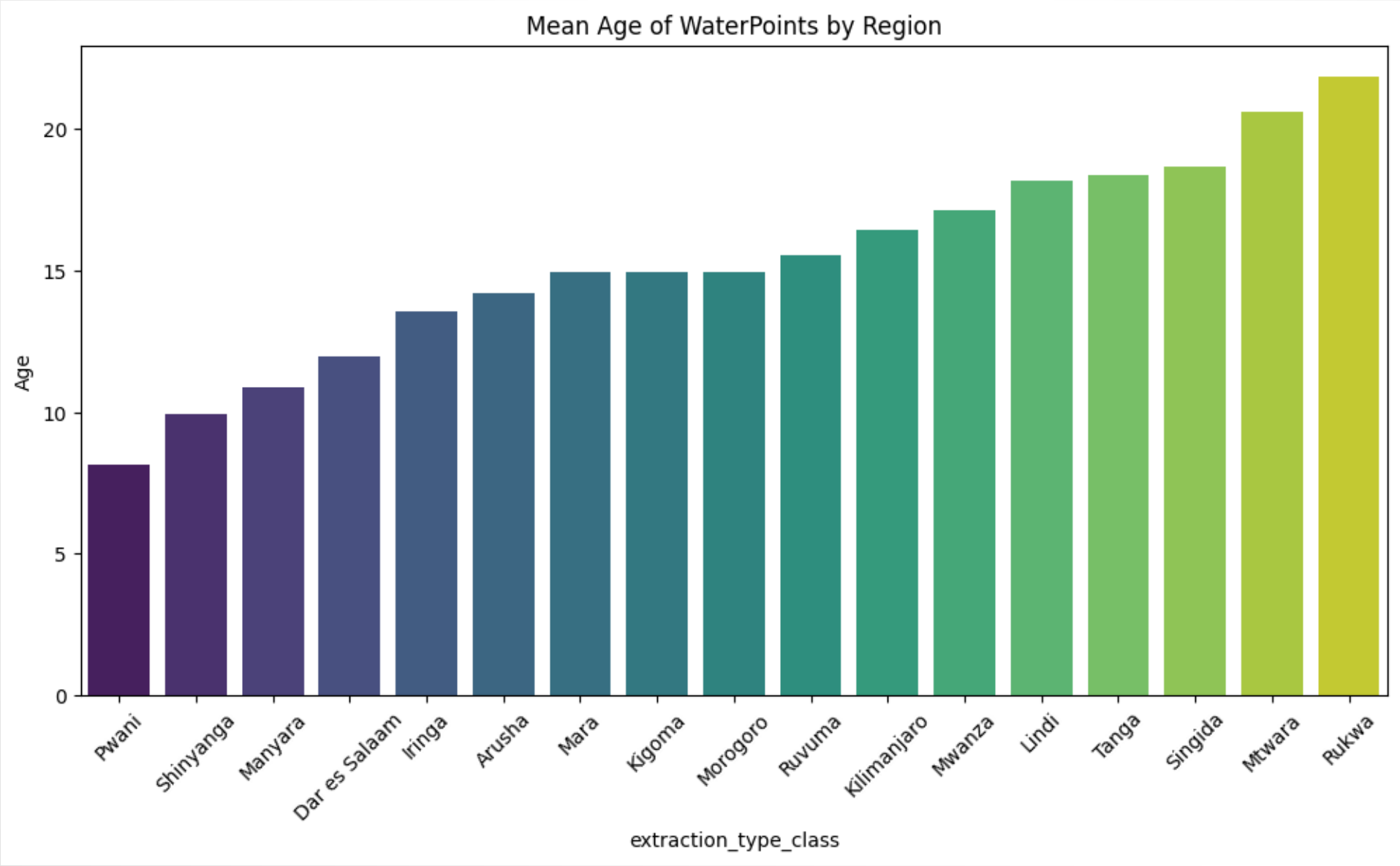
WATER EXTRACTION METHOD WITH HIGHEST WATER RETURN(TSH)

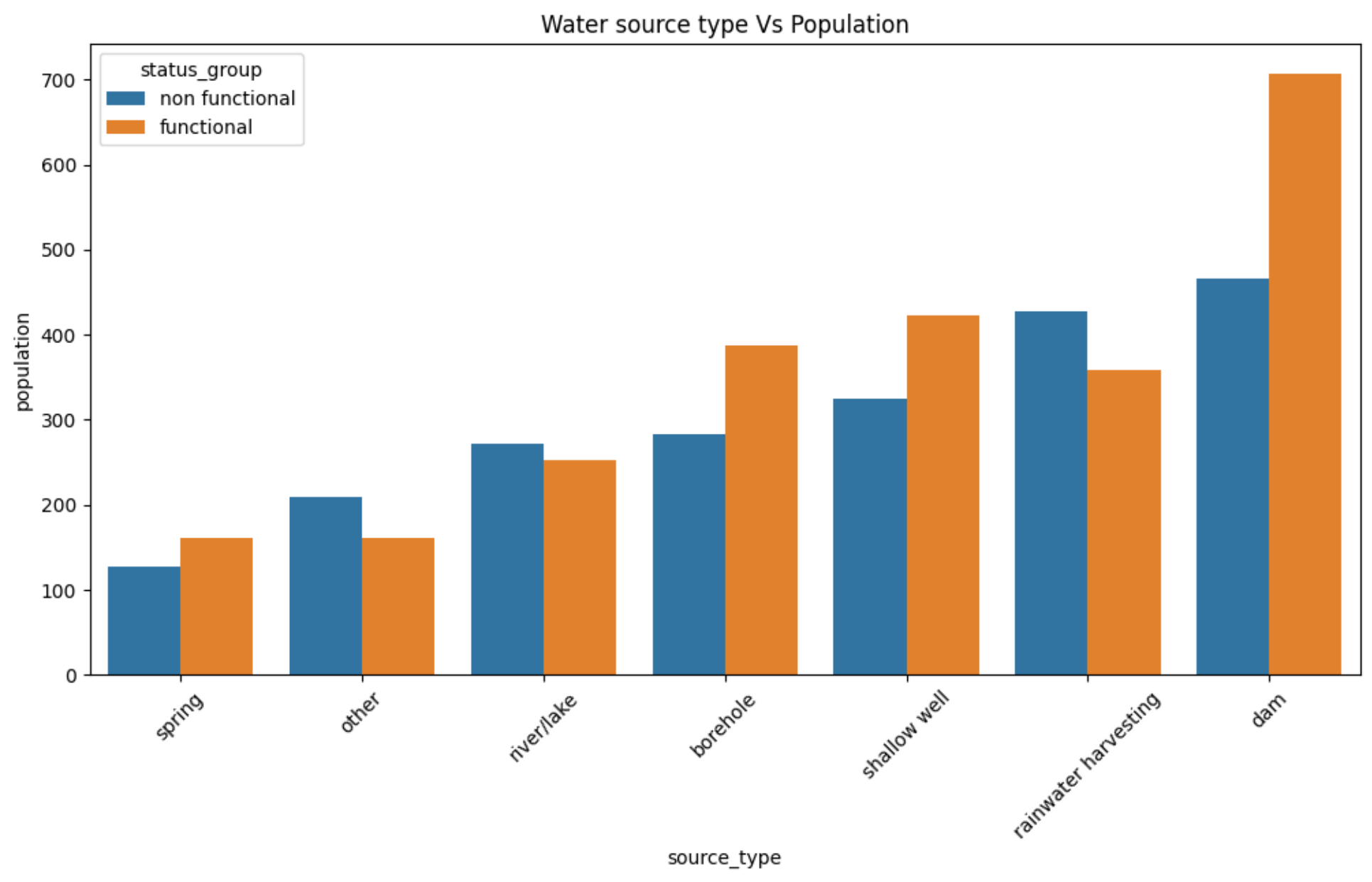


EFFECT OF ALTITUDE ON EXTRACTION METHOD USED




Population Access to Water Points By Region
population
0
100
200
300
400
500
Iringa
Kilimanjaro
Ruvuma
Dar es Salaam
Tanga
Arusha
Mtwara
Morogoro
Singida
Manyara
Pwani
Lindi
Rukwa
Shinyanga
Kigoma
Mara
Mwanza
region


Mean Age of WaterPoints by Region
Age
0
5
10
15
20
Pwani
Shinyanga
Manyara
Dar es Salaam
Iringa
Arusha
Mara
Kigoma
Morogoro
Ruvuma
Kilimanjaro
Mwanza
Lindi
Tanga
Singida
Mtwara
Rukwa
extraction_type_class


Water source type Vs Population
status_group
non functional
functional
population
0
100
200
300
400
500
600
700
spring
other
river/lake
borehole
shallow well
rainwater harvesting
dam
source_type

RECOMMENDATIONS

- Water Point Pumps require replacement every 10-15 years to ensure failure doesn't affect the population as well as a premise for predictive maintenance.
- Focus needs to be meet in regions such as Lindi, Mwanza, Mara and Rukwa which have high population accessing fewer water points.
- Leverage more reliable extraction type technology such as motor pumps which give more water output per water point.
- Seek green alternatives e.g. solar powered pumps to reduce reliance on inefficient hand and rope pumps
- Using the predictive algorithm, you can predict with up to 80% accuracy to prevent water point downtimes.

NEXT STEPS

- New data required as the dataset is missing significant data points and was recorded over 11 years so feature elements might have changed

THANK YOU!

ANY QUESTIONS?

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