Project Title: Maji Ndogo Water Crisis.

Introduction.

The Story of Maji Ndogo.
“Maji Ndogo, the vibrant heart of Africa. A nation where a mighty river flowed through its land bringing life to its children. This was once a beacon of hope. Thriving communities were built around fertile lands and an abundance of clean water. Our cities were bustling urban centres brimming with promise.
Today, the picture is quite different. A terrible drought made clean water a luxury. Everyday is a struggle as people queue for hours often in vain for their share of life’s most basic necessity. A legacy of mismanagement and corruption chocked of MajiNdogos’s life blood leaving its water infrastructure in ruins.
Greed blinded our government until there was nothing left. But dawn follows the darkest night. Our communities rose up, our voices echoed throughout MajiNdogo and together we brought about the dawn. This government is guided by the principles of transparency and efficiency. We embrace a future driven by data and truth.
Our first mission was clear, restore the flow of water in MajiNdogo. Wanted data to inform our decisions.
I am Aziza Naledi and I need your help. Our country thirsts for change and we are answering the call. We are assembling a diverse team committed to innovation, driven by compassion and fuelled by science and technology.
Help us understand this crisis. Help us restore the flow of water to Maji Ndogo and with it life.”

MajiNdogo is a hypothetical African state that went through a mismanagement phase which led to reduced access to water. In the message above President Naledi is calling in a team of experts to help chart the path to a solution. You serve as a data analyst in the team of experts.
This project consists of 4 sections that follow a systematic approach starting with identification of the faulty water infrastructure, error correction and finally implementation of solutions to fix the water problem in Maji Ndogo.

Data Dictionary.
This link provides access to a data dictionary explaining all the tables and their corresponding variables.
Maji Ndogo Data Dictionary

Section 1 .
In this section, we delve into the following:
- Familiarisation with our data.
- Dive into the water sources.
- Unpack the visits to water sources.
- Assess the quality of water sources.
- Investigate any pollution issues.

Section 2.
This section consists of queries written to:

- Cleaning the data.
- Obtain employees to be honoured for the commendable work during data collection.
- Analyse locations.
- Assess the water sources.

This section marks the start of a solution to the Maji Ndogo water crisis. Based on our analysis here, an audit report was prompted to ensure the validity of our data and to address some inconsistencies.

Section 3(Weaving The Data Threads of Maji Ndogo's Narrative.)

The focus in this section is to:

- Integrate the auditor's report.
- Link records from select tables.
- Gather evidence on corrupt employees.
- Contribute to the grand scheme of resolving Maji Ndogo's water crisis.

Section 4(Charting The Course For Maji Ndogo's Water Future).

In this final section, we can almost taste the waters of success. This section addresses:

- The removal of corrupt employees and potential legal action
- Further analysis of visits to water sources and the location of these water sources.
- Water source analysis in relation to provinces.
- Implementation of corrective measures for some water sources.

After the completion of the segmented analysis of the database with 60,000 entries, some insights were obtained.

Insights.

1. Most water sources are rural in Maji Ndogo.
2. 43% of our people are using shared taps. 2000 people often share one tap.
3. 31% of our population has water infrastructure in their homes, but within that group,
4. 45% face non-functional systems due to issues with pipes, pumps, and reservoirs. Towns like Amina, the rural parts of Amanzi, and a couple of towns across Akatsi and Hawassa have broken infrastructure.
5. 18% of our people are using wells of which, but within that, only 28% are clean. These are mostly in Hawassa, Kilimani and Akatsi.
6. Our citizens often face long wait times for water, averaging more than 120 minutes:

• Queues are very long on Saturdays.
• Queues are longer in the mornings and evenings.
• Wednesdays and Sundays have the shortest queues.

Plan of Action.

1. We want to focus our efforts on improving the water sources that affect the most people.
Most people will benefit if we improve the shared taps first.
2. Wells are a good source of water, but many are contaminated. Fixing this will benefit a lot of people.
3. Fixing existing infrastructure will help many people. If they have running water again, they won't have to queue, thereby shorting queue times
for others. So we can solve two problems at once.

4. Installing taps in homes will stretch our resources too thin, so for now if the queue times are low, we won't improve that source.
5. Most water sources are in rural areas. We need to ensure our teams know this as this means they will have to make these repairs/upgrades in
rural areas where road conditions, supplies, and labour are harder challenges to overcome.

Practical solutions:

1. If communities are using rivers, we will dispatch trucks to those regions to provide water temporarily in the short term, while we send out
crews to drill for wells, providing a more permanent solution. Sokoto is the first province we will target.
2. If communities are using wells, we will install filters to purify the water. For chemically polluted wells, we can install reverse osmosis (RO)
filters, and for wells with biological contamination, we can install UV filters that kill microorganisms - but we should install RO filters too. In the long term, we must figure out why these sources are polluted.
3. For shared taps, in the short term, we can send additional water tankers to the busiest taps, on the busiest days. We can use the queue time
pivot table we made to send tankers at the busiest times. Meanwhile, we can start the work on installing extra taps where they are needed.
According to UN standards, the maximum acceptable wait time for water is 30 minutes. With this in mind, our aim is to install taps to get
queue times below 30 min. Towns like Bello, Abidjan and Zuri have a lot of people using shared taps, so we will send out teams to those
towns first.
4. Shared taps with short queue times (< 30 min) represent a logistical challenge to further reduce waiting times. The most effective solution,
Installing taps in homes is resource-intensive and better suited as a long-term goal.
5. Addressing broken infrastructure offers a significant impact even with just a single intervention. It is expensive to fix, but so many people can
benefit from repairing one facility. For example, fixing a reservoir or pipe that multiple taps are connected to. We identified towns like Amina,
Lusaka, Zuri, Djenne and rural parts of Amanzi seem to be good places to start.

A practical plan.

Our final goal is to implement our plan in the database.
We have a plan to improve the water access in Maji Ndogo, so we need to think it through, and as our final task, create a table where our teams
have the information they need to fix, upgrade and repair water sources. They will need the addresses of the places they should visit (street
address, town, province), the type of water source they should improve, and what should be done to improve it.
We should also make space for them in the database to update us on their progress. We need to know if the repair is complete, and the date it was
completed, and give them space to upgrade the sources. Let's call this table Project_progress.