TANA MBANAS WATER CONNECTIONS

# Project Report

December 2023

## Clean Water Access for Tana Mbanas

Donation by:

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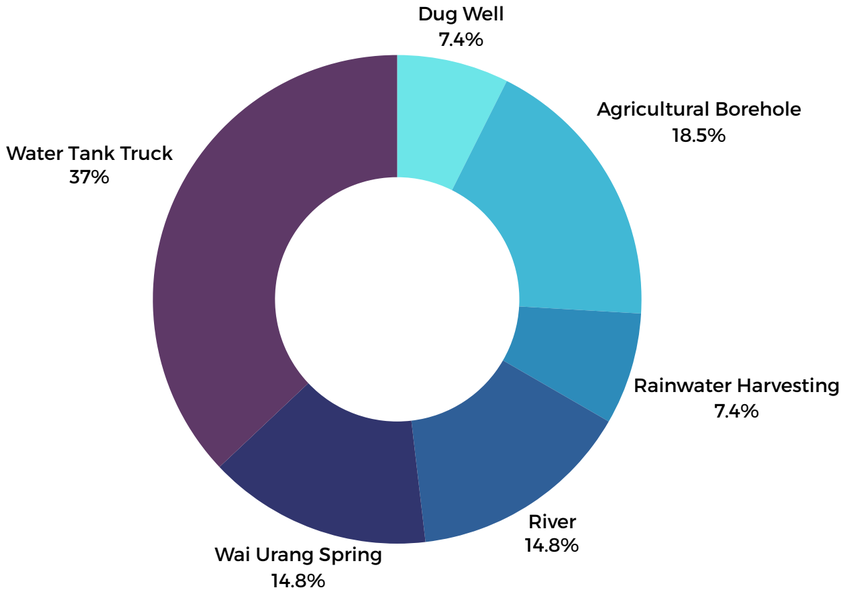
Monitoring Advisor

FAIR FUTURE

# BACKGROUND

Based on field observations and interviews with residents, currently, the people in Tana Mbanas have several options for accessing clean water.

Dug wells are a common source, but they often run dry, especially during the dry season. Agricultural boreholes have a water discharge of approximately 6,000 liters per day, but they are prioritized for farming activities near the borehole area. Some households have makeshift rainwater harvesting systems without filtration. Sanitation activities are carried out in the river, and water is also drawn from it for domestic needs, with a travel distance of 15-20 minutes on foot. Wai Urang spring has relatively good-quality water, but it is around 6 kilometers away from the church area. Water tank trucks are the preferred option for residents who have storage tanks at home, with prices ranging from 300,000 to 500,000 for 5000 liters.
There are several borehole points, but some are non-functional due to construction failures or damage.




Survey Insights Gathered from Village Tours and Interviews with Church Grounds Residents

In December 2023, rain began to fall with light to moderate intensity, and the ferrocement storage tanks were filled. Now, the church management and surrounding residents can utilize the facilities and have access to clean water and drinking water that has been established.

# PROJECT OBJECTIVE

The aim of this project is to improve the access of the Tana Mbanas village community, especially those around the church, to sustainable sources of clean water.

## OBTAINING CLEAN WATER SOURCES AND ALTERNATIVES

After conducting a survey, four potential locations for borehole construction were identified. As an alternative feasible for the church area, the project involves implementing a rainwater harvesting system by expanding the water storage tank.

## CONSTRUCTING RAINWATER HARVESTING AND FILTRATION SYSTEM

Utilizing the roof area of the church, a rainwater harvesting system with a filtration process will be established. The collected water will be stored in a large-capacity ferrocement tank, aiming to meet the essential clean water needs for an extended duration for both the church and the surrounding community of Tana Mbanas village.

## BUILDING A WATER DISTRIBUTION CONTROL SYSTEM

This system is essential to optimize the use of clean water and the refilling process, making it easier to consistently provide clean water for daily needs.

# PROJECT PLANNING AND IMPLEMENTATION PROCESS

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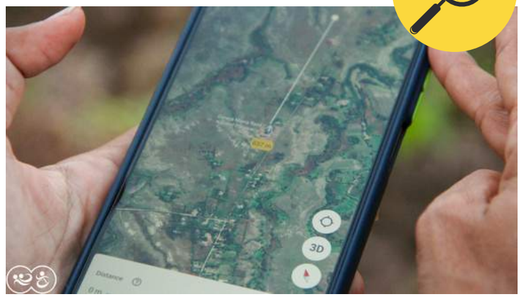
## ONLINE MEETING

Intensive communication is conducted among the donors, the foundation, and representatives of the beneficiaries from the Catholic Church in Tana Mbanas. Interactions aim to understand the needs, potential sources of clean water, and opportunities to obtain clean water in Tana Mbanas. Online meetings continue to take place from the pre-project phase to the post-project phase.

## FIELD SURVEY

In addition to online meetings, the foundation team conducts field visits to listen to and observe the conditions in the Tana Mbanas area directly.

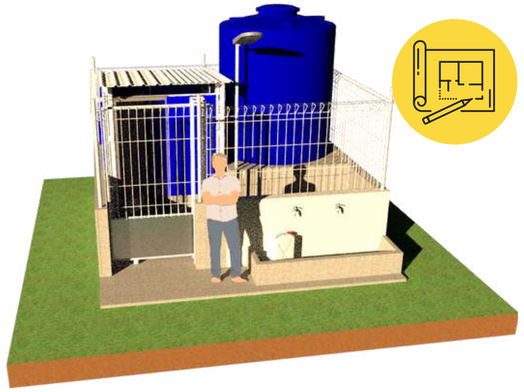
## DETECTION OF SPRINGS FOR DRILLED WELLS



.Inviting borehole experts to conduct surveys and detect spring sources, the conclusion is that within the church area, there is no potential for drilling a borehole with sufficient discharge. Four potential drilling points are identified, with depth ranging from 30 to 90 meters.

Hindered by the inability to obtain permission and land status issues from the landowner, a joint decision is made to cancel this process due to the relatively high risk factors.

## PLANNING DESIGN



Based on the analysis of the field survey, this serves as the initial basis for creating technical planning designs. These designs become a reference for calculating work duration, budget, and guidance for the technical field workers.

# PLANNING DESIGN

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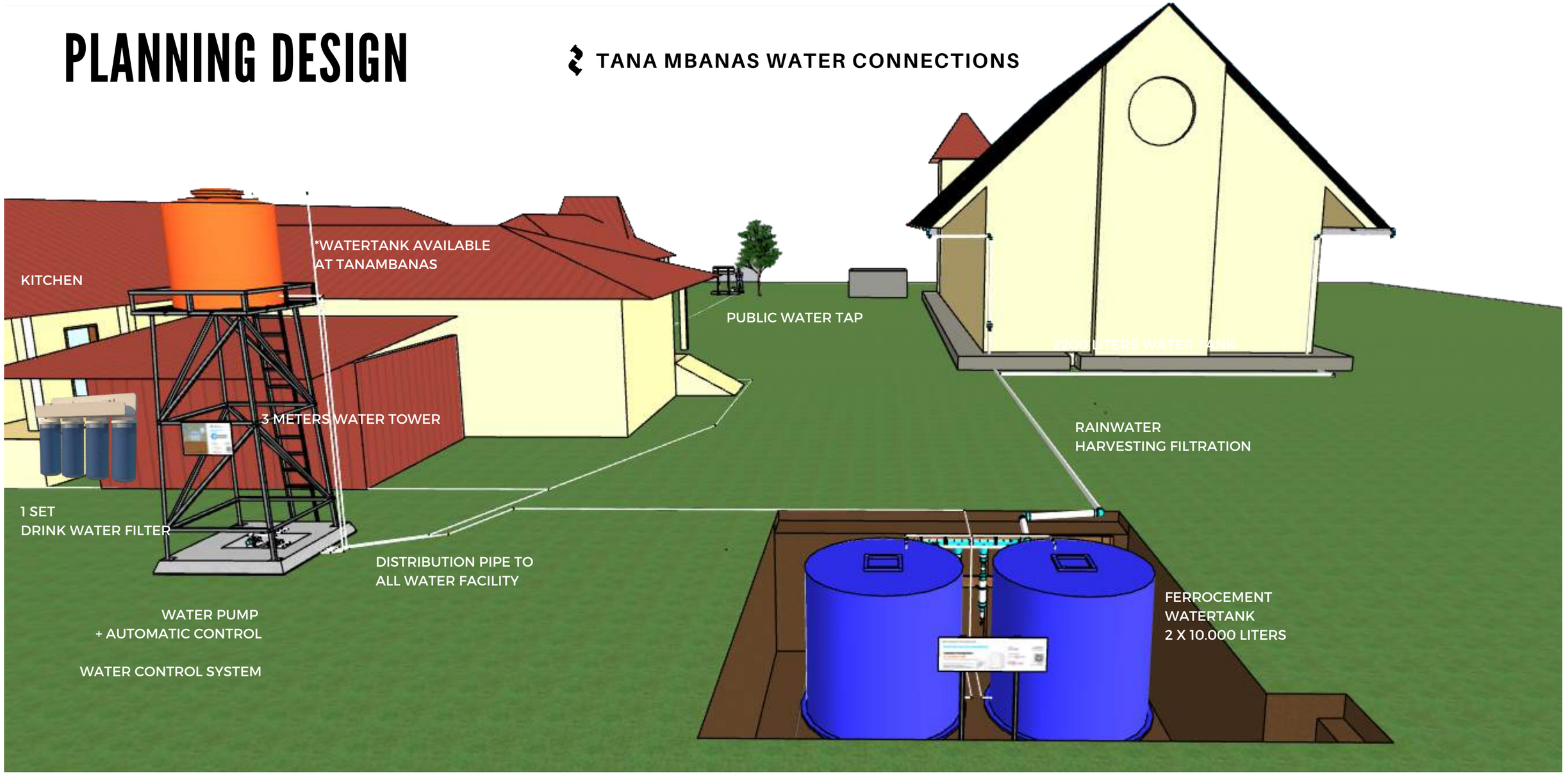

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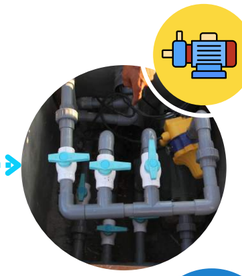
**To view the Facility Map**

RAIN WATER HARVESTING



WATER CONTROL DISTRIBUTION

RAIN WATER FILTRATION

WATER DRIP FILTER REVERSE OSMOSIS

WATER TOWER

PUBLIC WATER TAP

PIPELINE DISTRIBUTION

FERROCEMENT WATERTANK

# SITE PLAN OF THE BUILT INFRASTRUCTURE

# INFRASTRUCTURE BUILT

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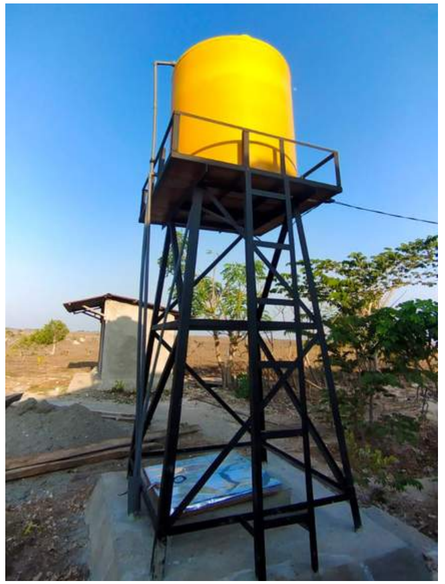
## RAIN WATER HARVESTING

The Rainwater Harvesting System is a groundwater conservation system through collecting and utilizing rainwater to meet water needs.
Utilizing the surface area of the church roof which is captured by PVC pipe gutters along the roof to catch rainwater that falls and then go through a dirt filtering process.

## RAIN WATER FILTRATION

The rainwater filtration process is an important part of preventing dirt from the roof from entering the ferrocement storage tank.
By filtering up to 5 stages, it is hoped that the collected rainwater will have good clean water quality.



## WATER TOWER

The water tower was created to create a method of distributing water using a gravity system, it is possible to get water pressure that slides without using electrical energy.
If the fiber reservoir on top of the tower contains water, then the water can be distributed, even if the PLN electricity goes out.
Made of angle iron material and combined with waterproof laminated wooden planks, it supports the strength of a reservoir weighing 2 tons.

## FERROCEMENT WATERTANK

As part of appropriate technological innovation with more economical materials, and a technical work system that is not too difficult, Ferrocement is one of the water storage solutions in rural areas.
It is hoped that this technology can be duplicated by local communities for sustainability.
In this project, 2 Ferrocement tanks were built with a total capacity of 20,000 liters.

# INFRASTRUCTURE BUILT

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## WATER CONTROL DISTRIBUTION

This is an important part of controlling the rate of water distribution, determining where the water is drawn from, and in which direction the water is pushed.

With a Semi Jet Pump water pump equipped with Automatic Pressure Control, Check Valve and Ball Valve, it allows water to be sucked in and pushed in all directions.

## WATER DRINK FILTER REVERSE OSMOSIS

Reverse Osmosis (RO) filters are a type of water filtration that uses a pressure process to separate particles, molecules and ions from water through a semi-permeable membrane. The result is water that is cleaner and free from most contaminants. This process is known as reverse osmosis because it directs the flow of water from areas of high concentration to areas of low concentration, going against the natural direction of osmosis.

With an RO filter system, you will get safe and high quality ready-to-drink water.

## PIPELINE DISTRIBUTION

This new pipe line was created to be able to channel water to existing taps, both to the rectory building and to new tap points for the general public of Tanambanas village.

## PUBLIC WATER TAP

The residents' water tap point is a water tap for sharing clean water with the general public and the community around the Tanambanas church.

# CHALLENGES AND SOLUTIONS

| CHALLENGE | IMPACT | SOLUTION |
|---|---|---|
| Failure to obtain permission from the owner or land certificate with unclear status. | The drilled well method had to be abandoned due to the uncertainty of its sustainability. | Replacing the method of obtaining clean water sources with a rainwater harvesting system. |
| Rainfall with sufficient intensity only occurs in its season. | The ferrocement water tank will only be filled with rainwater during the rainy season. | • The storage tank is made with a capacity of 20,000 liters and is expected to be able to meet clean water needs for quite a long time.<br>• The Ferrocement Water Tank is designed to collect clean water other than rainwater, it can accommodate water from water tank trucks, dug well water (currently not operating), and village clean water (currently dry) where pipes already exist. |
| Low community participation in the clean water facility development process. | Clean water facilities are not well maintained due to low community attention, lack of sense of ownership, and lack of knowledge of the project facilities being carried out. | • The church needs to get closer to the community more often, by increasing activities, enlivening the community with citizen involvement to enliven the church. An example of such activities in other places is activating the OMK (Catholic Young People) community.<br>• The 5 residents who attended had the opportunity to learn with a theoretical presentation on making ferrocement water tank. |
| The church area is inhabited by one person, a high school student. Occupied by more than one person during church activities. | No one was present at church during school hours. The main manager who lives in Lendiwacu (2 hours away) will stay overnight when worship activities are scheduled.<br>The security of the church facilities, especially the clean water facility, lacks attention. | Pengelola gereja perlu menambah penghuni yang lebih berperan aktif dalam pengelolaan manajemen gereja dan aktifitas pendukungnya. |

# CHALLENGES AND SOLUTIONS

| CHALLENGE | IMPACT | SOLUTION |
| --- | --- | --- |
| Pipeline control paths are not easy to understand | The distribution of clean water flow may not flow to the proper place, which can cause the pipe to be damaged, if the faucet in the control system is not open at least 2 ways | Operator who open and close the flow of control valves must understand the control system by reading the manual |
| Drinking water filters will get dirty quickly if the source of clean water relies on rainwater | The filtered drinking water from the Reverse Osmosis filter will often become clogged, the drinking water pump will not work properly | Carry out regular checks, once every 2-3 months need to be disassembled and cleaned and have to replace dirty filters on time, read the guidebook for price references, purchase online, or contact the foundation team if you don't understand |
| Ferrocement water tanks can leak or the cement peels and cracks if exposed to hard impacts or pores crack (leaks the size of a hair) if exposed to heat for a long time and never filled with water. | The ferrocement water tank is leaking, the water is not stored properly. | It is necessary to patch the leak with acian plaster (a mixture of cement and water, or use a waterproofing layer such as Damdex or another brand.<br>If the weather is hot, the reservoir needs to be sprayed with water, or you need to leave a little water in the tub. |

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# POSITIVE ACHIEVEMENTS

## AVAILABILITY OF FREE, CLEAN WATER

Communities around the church and village residents can access clean water easily through the distribution system that has been built.

## FULFILLMENT OF BASIC NEEDS

Clean water is the basis for fulfilling basic needs, such as personal hygiene, cooking and drinking, which overall can improve people's welfare.

## POSITIVE CONTRIBUTION TO THE CONSERVATION OF NATURAL WATER RESOURCES

Natural Resources Conservation: By relying on rainwater as a source, this project can make a positive contribution to the conservation of natural water resources.

## IMPROVING QUALITY OF LIFE

Adequate access to clean water can contribute directly to improving people's quality of life, including health and sanitation conditions.

## INCREASING ENVIRONMENTAL AWARENESS

This project can be a starting point for increasing environmental awareness in society, especially regarding the importance of water conservation and natural resource management.

## REDUCTION OF ACCESS GAPS

This project can help reduce the gap in access to clean water between urban and rural areas or between community groups.

## IMPROVING CHURCH SERVICES

Churches can provide better services to their congregation and the surrounding community through well-managed clean water facilities.

## PREVENTION OF WATER RELATED DISEASES

With better access to clean water, the risk of transmitting water-related diseases can be reduced, improving the health of local communities.

# SUSTAINABILITY AND MAINTENANCE

Sustainability and maintenance of clean water facilities are crucial to ensure that communities continue to have access to safe and adequate water. Here are some steps and strategies that can be outlined to maintain the sustainability and upkeep of clean water facilities:

1. Increasing Community Participation:
    - Step: Engage the community and church groups in the planning, implementation, and maintenance of clean water facilities.
    - Strategy: Conduct regular meetings with the community and church members to discuss needs and changes in water facility management.
2. Planning and Regular Maintenance Schedule:
    - Step: Establish a regular schedule for the maintenance of clean water facilities.
    - Strategy: Have a technical team or maintenance personnel perform periodic inspections, repairs, and preventive maintenance.
3. Refer to the Clean Water Facility Guidebook:
    - Step: Understand detailed information about each constructed facility.
    - Strategy: Adhere to guidelines regarding what can and cannot be done to maintain the functionality of the facility.
    - Strategy: Address any issues of damage or component replacement in accordance with the guidelines.
    - Strategy: If there are difficulties in obtaining spare parts or repairing damaged equipment, contact the foundation's team for assistance in the purchasing process.

Development Plan: The built clean water facility can be expanded or enhanced to meet potential needs. For instance, it could incorporate new water sources aside from rainwater, such as from dug wells, access to piped water supply (PAM), or water from the village's clean water source, as well as water delivery through tanker trucks. The storage tank capacity can be increased either within the existing tank area or in alternative areas.

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# SUSTAINABLE DEVELOPMENT GOALS


## ERADICATE POVERTY

Construction of clean water facilities to improve the quality of life, overcoming unaffordability due to poverty


## ACCESS CLEAN WATER AND SANITATION

Availability of access to clean water and quality, unpolluted clean water reservoirs connected to healthy sanitation.


## GOOD HEALTH AND WELL-BEING

With easier access to clean water and healthy sanitation, a healthy lifestyle can be implemented in a sustainable manner


## PARTNERSHIP TO ACHIEVE GOALS

Involving other village communities to build their own healthy sanitation facilities, from and by residents, the goal is achieved and maintained together

# PRE-POST PROJECT DOCUMENTATION

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## RAINWATER HARVESTING INSTALLATION


## WATER TOWER

## WATER CONTROL INSTALLATION

# PRE-POST PROJECT DOCUMENTATION

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## FERROCEMENT WATERTANK

## PIPE AND WATER TAP INSTALLATION

## DRINK WATER FILTRATION

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FAIR FUTURE

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