

**PROGRESS  
REPORT**

**2021**



# JUSTICE AND MERCY COMMUNITY INTEGRATED PROJECT

## JAM



**BOREHOLE PROJECT FOR  
ST.ELIZABETH SWINDON CLINIC**



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## **1 INTRODUCTION**

Curtesy of the previous partnership with Kitchen Table Charity Trust (KTCT), JAM benefited in the construction of a modern maternity and baby care unit in the rural community of Rachuonyo South. JAM through St. Elizabeth Swindon Clinic realized the increase of service demand by rural population and the use of modern facility especially modern toilets within the wards which has become a challenge due to unreliable running water from the local authority. A reliable source of water was therefore necessary to ensure sanitation especially for the flushable toilets, bathrooms and also to address great water challenge witnessed during Covid -19 pandemic more so in the hospital set-ups.

As a result, JAM did again approach KTCT for funds to ensure permanent solution of water in the clinic and to expand agricultural production and innovation. KTCT, DCM Kisumu and JAM IGAs supported JAM St. Elizabeth Swindon Clinic with grants to drill a borehole, install a solar powered pump and storage tank, and construct bio-digester to treat and recycle human waste into organic manure to increase food production for community OVC under care and support for JAM. This report clearly states progress of the project, challenges faced during implementation and gives recommendations for future expansion of the project.

### **1.1 Objective of the Project**

The projects aim was to:

- Ensure stable supply of water at St Elizabeth Swindon Clinic for improved sanitation.
- Enhance availability of water for the community to use domestically and in their farms to improve food security.

### **1.2 Rationale of the project**

Since establishment of the St Elizabeth Swindon Clinic, the hospital has been faced by lack of stable water supply as it has been relying on supply from the local government and rain water. The hospital is also located in area with limited tap water supply network and unpredicted weather making rainwater harvesting unreliable source. It was thus considered to be unfavourable hence the only solution was found to be a borehole to serve the hospital as well as the surrounding rural communities.

## **2 PROGRESS OF THE WORK**

### **2.1 Geological Survey.**

Prior to the drilling of the borehole, thorough and detailed hydro geological and geophysical borehole site investigations was done to ensure the project conforms to the Water Resource Authority Management (WRAM) and National Environmental Management Authority (NEMA) requirements. This was done through detailed desk study, a process that included review and analysis of existing information of borehole drilled in the region, maps, and other reports in the neighbourhood of the project area since the area has several drilled boreholes upon whose data could be relied upon.

Upon analysis, the survey found the area to be within hydrogeological zone characterised with medium groundwater potential. The quality of groundwater throughout the project area was found by the team to be good for human consumption and this was clearly confirmed after sample of water from the borehole was analysed after the drilling.

**Table 1: Summary of Hydrological Report**

Hydrological Parameter	Estimate Value
Catchment	$4.5 \times 10^7 \text{m}^2$
Aquifer extent	$1.0 \times 10^7 \text{m}^2$
Aquifer Thickness	50 metres
Storage Coefficient	$1.5 \times 10^4$
Specific Yield	10%
Precipitation	$4.95 \times 10^7 \text{m}^3/\text{year}$
Recharge	$4.955 \times 10^6 \text{m}^3/\text{year}$
Proposed Abstraction	$5.475 \times 10^3 \text{m}^3/\text{year}$

## 2.2 Drilling and Installation Works

The drilling of the well was done by the Western Water Wells Company. It involved use of rotary method and the first water aquifer was reached at 30 metres. The drilling continued to a stability depth of 100 m then cased with Plain UPVC casing and Slotted UPVC casing placed slightly opposite the water strikes that were identified during the drilling.

To ensure long-term sustainability of the borehole, silica gravel packs was installed in between the casing and annulus of the borehole and bentonite seals installed in top 0.5 metres off the surface to prevent surface run-off from being ingested into the borehole and contaminating the water.



**Figure 1: Drilling and Casing Process.**

### 2.3 Pump Testing and Water Quality.

Pump testing for the borehole was done by Medow Group Limited using DSP-5 pump. It started with 6\*1 hour Stepped Drawdown of up to 70 metres followed by a closely monitored 24-hour Constant Discharge. After the pump testing, a water sample in a plastic bottle was collected from the borehole for Physico-Chemical Analysis and the results received showed that the water was clear with good mineral content hence recommended for domestic use (Detailed analytical report in the appendix).



*Figure 2: Complete sealed borehole connected to the solar powered pump (L), water connection to the 10,00 litres tank (R).*

## 2.4 Installation of Solar Powered Pump and Water Reservoir

From the pump testing report, the team recommended a stability point of 70 m for installation of the submersible pump to pump the water to the reservoir for use at the hospital. A High Quality submersible solar Water Pump 100m was then installed to pump the water. To match supply to demand of water, water tanks were installed to supply the community and the hospital. To gravity feed water to the hospital, a water tower has now been erected which will hold 5000 litres tank to supply the maternity and ANC units of the clinic.



Figure 3: Erected water tower to hold 5000 litres tanks to supply maternity and ANC units.



Figure 4: Installed Solar Power System (Solar panels and Invertor) to run the pump



## 2.5 Project Impact

Since inception of the project, the following have been realized in the hospital and the community at large:

- St Elizabeth Swindon Maternity and ANC units have witnessed reliable supply of water and improved sanitation.
- Reduced water bills hence increased savings by the Clinic.
- Increased access to clean, safe, reliable and sustainable water for domestic use and for farming by the community served by JAM.

## 2.6 Project Sustainability.

To sustain this project, the beneficiaries (Mainly event organizers and water boozers) pay minimum water charges to sustain various costs for maintenance of the project. This has picked up well since the community were fully involved in the identification and implementation of the project. We expect the community to take about 4000l/day and sell to water trucks about 10,000l/day. Secondly is sourcing for funds to install water plant as JAM borehole gives very quality water highly recommended for bottling.

## 3 CHALLENGES

Despite the success that has been made in the project, few challenges have been faced in the implementation process as follows:

- The recent increase in cost of products and services in the country has seen the cost of drilling of the borehole going up from the projected 2,100 to 3,500.
- Resources available for the project were limited resulting to some of the project objectives not being met such as the installation of bio-digester for waste maintenance.
- As project implementation was ongoing, few areas were identified that could have played significant role in ensuring sustainability of the project such as Installation of drinking water bottling plant which was not captured in the needs assessment.

#### **4 SUMMARY AND CONCLUSIONS**

The drilling of the 100 meters boreholes has been successfully done and the community have started to benefit from it. Using the solar water pump, water can be pumped into the reservoir for use by the hospital and sales to community. A second face of the project that involved establishment a bio-digester at is yet to pick off and after completion of the project there is expected to be an exemplary improvement in sanitation within the hospital and improved quality healthcare services for the community

#### **5 LESSON LEARNT**

It has been noted that community mobilization is very essential in implementation of every project and that it does not just involve telling the communities what will be done and how but also informing them on their level of involvement in problem identification and giving them room to make decision on the implementation and the course of action to be taken to address the problem. This is very essential for sustainability. Being flexible to new ideas is key to project great impact JAM management was able to listen to advice with regards to drilling of borehole as oppose to rain harvesting.

#### **6 FUTURE PROJECTS**

##### **6.1 Water Bottling**

Installation of water bottling plant to bottle water to take advantage of expanding market for drinking water consumption by the surrounding community is a key area for expansion of the project. The plant will produce pure drinking water of different classes and sizes as 500ml, and 1L. JAM will form an exclusive, innovative brand that will distinguish our bottled water products from other companies' products and make a name as "the manufacture of a comfortably tasty water." Our water will also be of high-quality and be of reasonable price. The proceeds from this will be directed toward supporting Orphans and vulnerable children school fees, Maintenances of the borehole and water system and promote rural poor farmers through value additions.

##### **6.2 Biodigester**

Biodigesters convert organic waste into nutrient rich fertilizer and biogas. With the water supply already in place, Construction and installation of biodigester to treat waste at the facility and transform it into natural fertilizer and fuel as one of the projects was not realised due to budget constraints but it's something that is in pipeline and will be implemented once funds are available. This will significantly help to reduce organic waste at the facility which are currently being channeled to the pit latrine and also act as source of organic fertilizer for farming activities.