

# Water and Sanitation Project Outline 2015-16

This document provides a technical overview of the project proposed, explaining why the design method was chosen, what the proposed design is and how Cameroon Catalyst intend to implement the project.

## Project Outline

Cameroon Catalyst plan to construct 10 modern wells across the region of East Cameroon. These are designed to incorporate the traditional well construction techniques used for centuries while adding measures to ensure the quality of water in the well.

Cameroon Catalyst have produced preliminary designs for the project (Figure 1) along with budgeting and a construction timeline. These will be refined in the coming months as more information is acquired on site conditions within Cameroon.

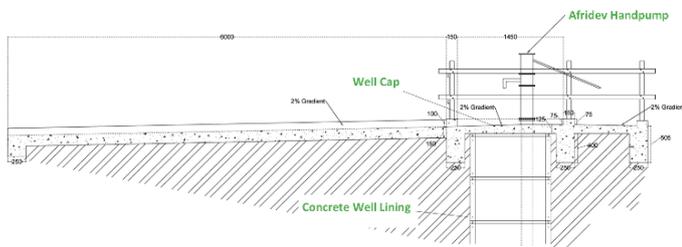


Figure 1 General Arrangement of the proposed modern wells

Specific sites have not yet been selected for the 10 water projects, however research conducted in February 2015 by Cameroon Catalyst found there was a severe shortage of safe water sources in the region. We will therefore use this research and work with the local communities to help identify the most suitable sites for the projects.

## Modern Well Technical Details

Modern wells are based around the similar concepts to traditional hand-dug wells, however integrate three main additional components to improve on their design: a hand pump, a well cap and a well lining.

By capping the well and providing a pump, contact with the water can be avoided compared to the traditional method of rope and bucket. This helps prevent contamination and limits the spread of infections among the local population.

Concrete rings are integrated into the well lining and serve two purposes: firstly, they provide structural support during construction of the well. This not only allows wells to be dug deeper, but improves the safety the excavation as there is a reduced risk of collapse. Secondly, the concrete acts as a barrier to contamination and helps protect the water source.

## Alternatives to Modern Wells

While developing our project design, a number of alternative were considered as alternative options:

**Bored Wells:** these are commonly installed and use a drilling rig to bore a deep well into the ground. While they produce safe water sources, they are prohibitively expensive and rely on external contractors to construct. Our cost estimates suggested these would cost in excess of £10,000 each, more than double the cost of a modern well.

**Spring Protections:** although cost-effective, there are limited opportunities in the region for such projects.

As a result of these issues it was decided that modern wells would be the most suitable for regional development, providing a cost-effective solution which could provide the water requirements for thousands of people.

## Water Pump

The projects proposed will use the Afridev pump system as it is this the most cost effective and suitable for the project design. In addition, it is the most widely used pump in the region, and therefore the skills and knowledge to maintain the pump are readily available. This will ensure that there is ongoing maintenance for the projects to enable long-term supply of water.



Figure 2 An Afridev handpump

## Delivery of Projects

From March 2016, an intern will be based in Cameroon to help aid the design by carrying out site investigations, sourcing materials and finding appropriate contractors to construct the projects. This will help to ensure the timely delivery of the project to schedule and will also ensure that an appropriate design is produced taking into account the local constraints.

### Site Selection

It is important that before the project construction begins that suitable sites are chosen. Among the most important aspect of the site choice is to ensure that groundwater is at a depth that can be reached by a modern well (less than 20m).

Local soil conditions and water table information will be gathered at potential sites. This information will then be used to understand whether a project is viable at that location, and will allow the design to be refined for the particular conditions.

### Construction

The projects are to be constructed from July – December with assistance of Student team, hydrogeological experts from Groundwater Relief and people from the local communities. Work on each site will first require the construction of concrete rings for the lining. This can be achieved using basic formwork and local skills, and needs to be done several weeks before the digging of the wells to ensure that the concrete is adequately cured.

Once the well is ready to be excavated, the concrete rings are slowly dug into the ground until the water table is reached. Once the lining is complete, the capping can be constructed and the handpump installed.

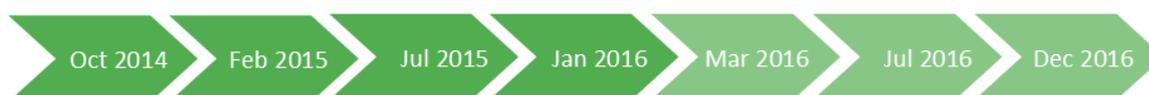
## Project Timeline

**Oct 2014:** Water and Sanitation project started following preliminary research

**Jul 2015:** Spring Protection constructed in Mbelle Mbeke

**Mar 2016:** Cameroon Catalyst intern to travel to Cameroon to establish local supply chain

**Dec 2016:** 10 wells to be constructed by the end of the year



**Feb 2015:** Hydrogeological field trip to collect local groundwater conditions.

**Jan 2016:** Preliminary design and budget produced for modern well projects.

**Jul 2016:** Student team to travel to Cameroon and assist construction of first projects

## Monitoring & Evaluation

We have developed a monitoring and evaluation strategy to ensure we learn from our experience and improve the performance of our work. For this project we have identified a few key points:

- Water samples will be taken before the projects are built to establish a baseline
- Upon completion of the wells, surveys will be undertaken to assess the impact on health
- Water quality will be assessed periodically to ensure standards are maintained and protect against future contamination

## Project Outcomes

Along with the construction of the modern wells, we hope to achieve a number of outcomes:

- Provide training to local workers to enable them to construct modern wells independently
- Develop a spreadsheet tool which can be used to help assist the design of modern wells in the region. This will enable builders to tailor the design for the varying soil and groundwater conditions in the region.
- Provide our information acquired in this project to the local government to help improve planning in the region.

## Additional Information

If you have any queries about our work, please contact [info@camerooncatalyst.org](mailto:info@camerooncatalyst.org)