



Student Association for International Water Issues

Using Hydrophilanthropy to Improve Rural Life in Cameroon

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Graduate Program of Hydrologic Sciences



Abstract SAIWI (Student Association for International Water Issues) is a student non-profit group at the University of Nevada-Reno (UNR). SAIWI's mission: "To develop an understanding of global issues and apply our time and knowledge to promote lasting partnerships that empower others in dealing with water resources." In January 2009 SAIWI traveled to Nkambe, Cameroon (Fig.1) where they taught well drilling technology, constructed a well for drinking and irrigation, expanded a local organic nursery, and taught water hygiene seminars.

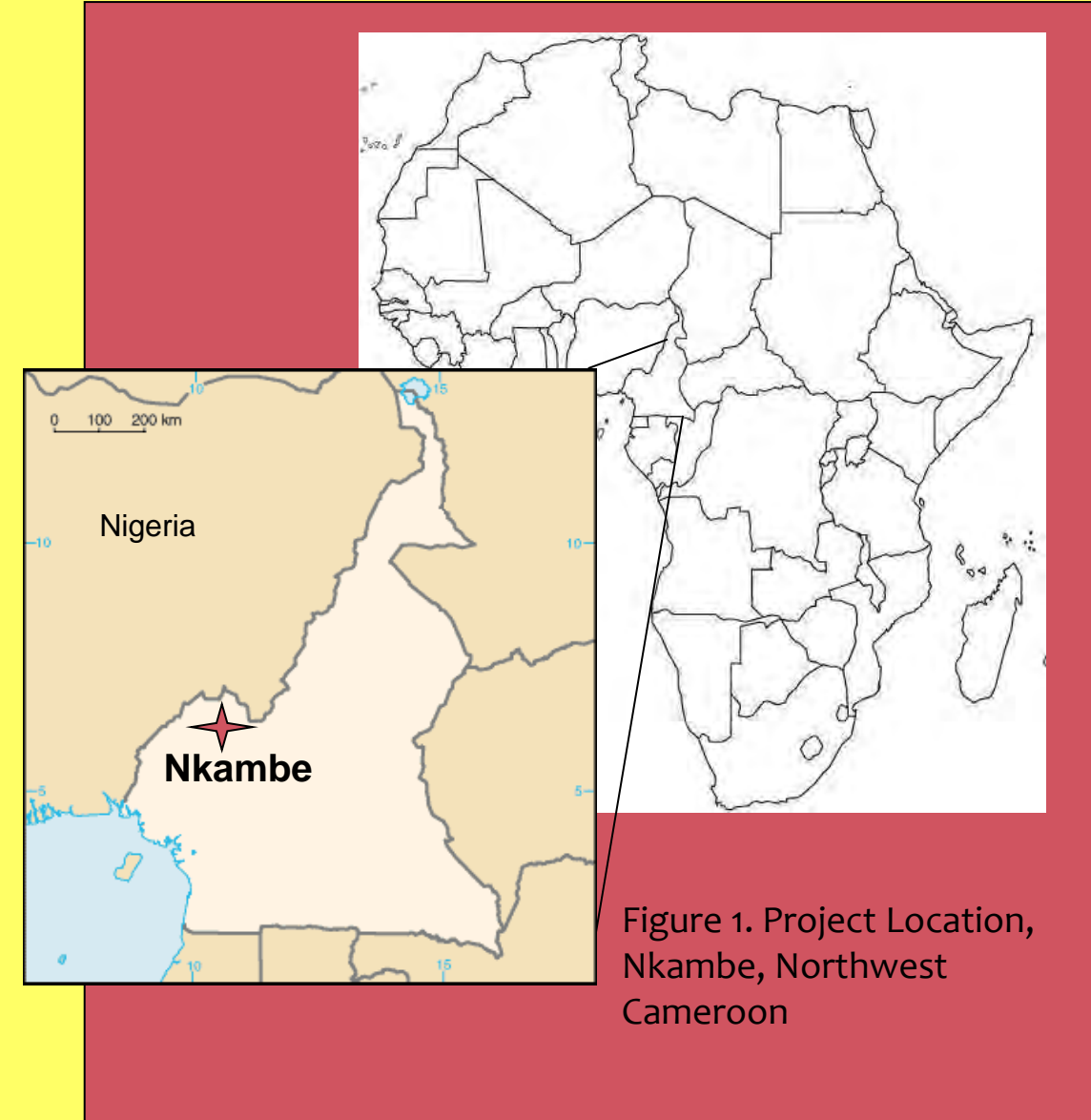


Figure 1. Project Location, Nkambe, Northwest Cameroon



Teach Manual Well Drilling Technology



The Terry Waller manual well drilling method allows access to shallow groundwater (Fig 2). Using inexpensive, in-country supplies to construct the support structure and drill stem, this method is appropriate for developing nations. The method uses man-powered upward and downward strokes to advance a drill stem and evacuate sediment from a borehole (Fig 3 & 4). For repeated strokes, a pulley and rope system is used to lift the heavy drill stem. Once the borehole is established, the well casing-is screened and inserted into the hole. The annular space is filled with gravel, the well is backwashed, a drop pipe and pump installed, and the well developed until all sediment is cleared.



Well Site Before

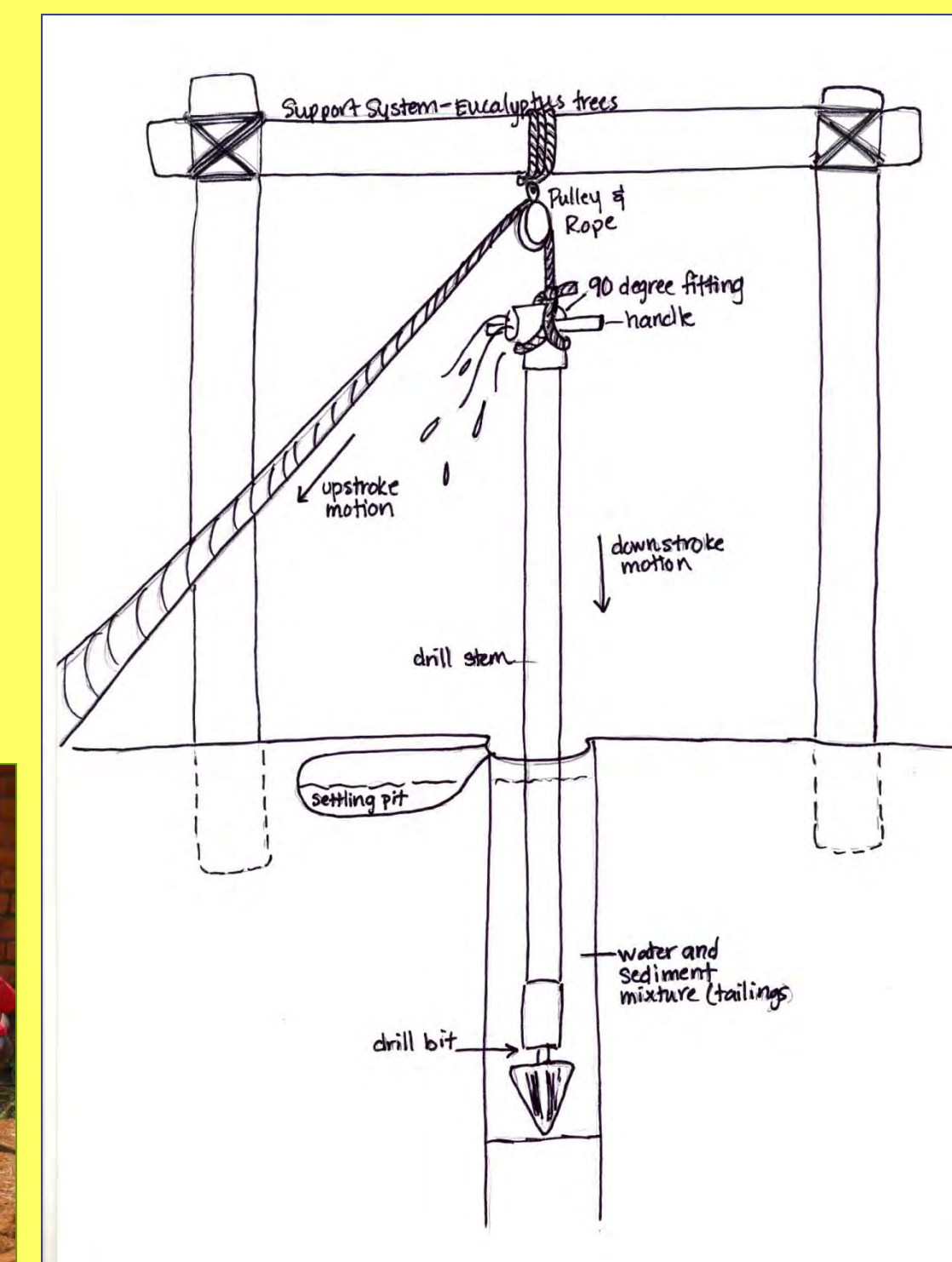


Figure 2 Manual Drill System. A crossbeam support structure was made from trees lashed together. A pulley is fixed to the crossbeam over the borehole. Handles are tied to the rope and 4-6 people provide the upstroke power, while additional hands provide the downstroke power at the borehole. The drill stem advances as tailings are circulated from the borehole up the drill stem and into a settling pond. The sediment settles in the pit and water returns to the borehole. The drill stem length is increased by adding additional pipe.



Well Site After: Our in country host pumps ~20L/ min from the well. Water quality tests showed the water was safe for drinking.

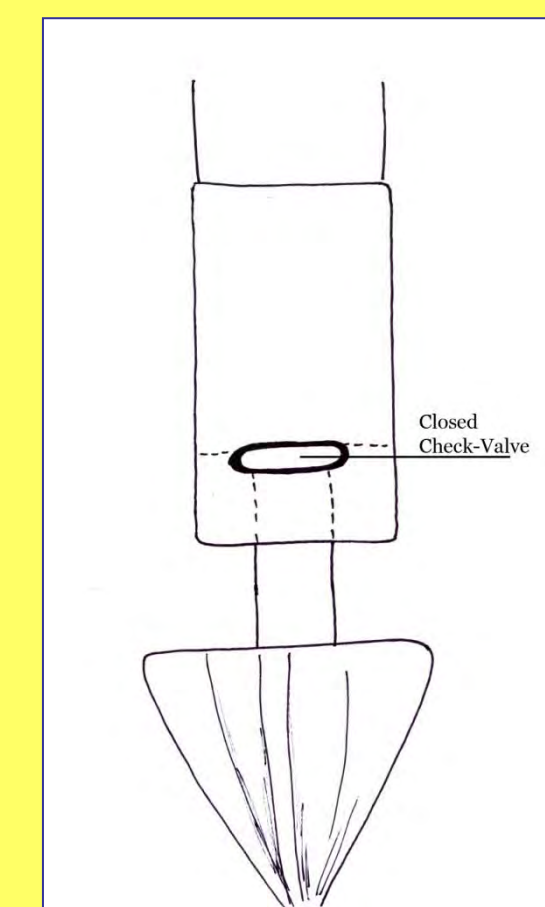


Figure 3. The upstroke with a closed check valve forces tailings out of the drill stem and into the settling basin.

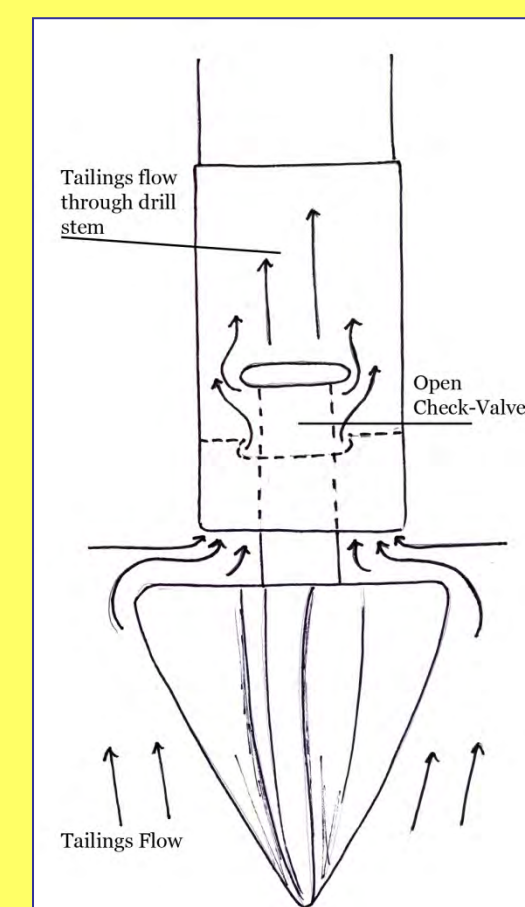
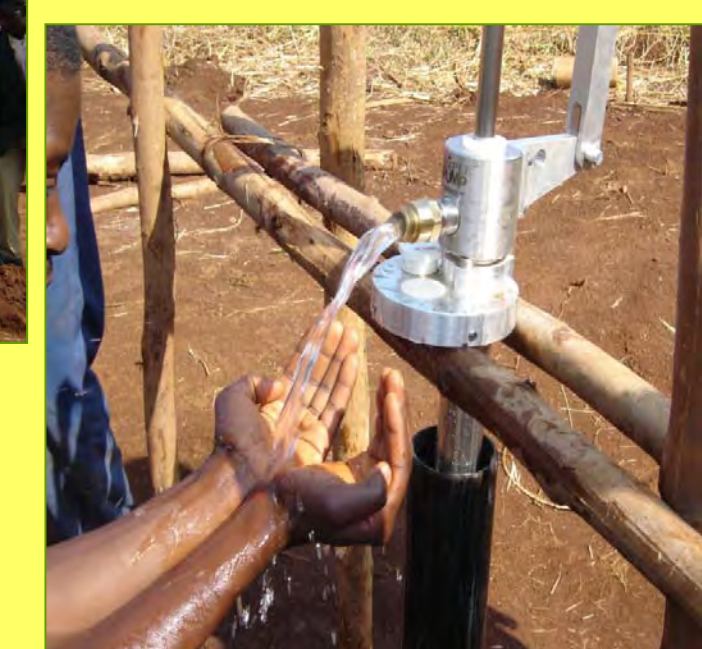


Figure 4. On the downstroke, as the drill bit impacts the bottom of the borehole, water and sediment (tailings) flow into the drill stem.



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Improve Public Health

World Health Organization resources, and water quality tests made up the seminar. Our goal for this program was to teach two sessions with 20-30 key community members in attendance. The community requested four more seminars and over 250 participated. Participants learned how to block transmission of pathogens into water and food. Local water sources were tested for bacteria (*E. coli*) followed by a discussion of how to eliminate pathogens from water by boiling, solar radiation, or adding bleach. We also provided supplies to construct portable hand washing structures (e.g. Tippy tap) for use at latrines.



Water Quality Testing of areas water sources, pink areas are positive for bacteria.



Tippy Tap Demonstration



Elvis participated in the water hygiene seminar. He is outside his latrine with a new tippy tap he uses for hand washing.

Promote Sustainable Farming

SAIWI & locals constructed a 3-bin compost system at an organic garden. The system quickly creates nutrient rich compost that increases soil fertility and crop yield, reducing the need for fertilizers. The system was made with locally harvested wood, using a hammer and nails. The interior walls are removable as well as the door to each bin. The result is three accessible bins that allows easy compost turning from one bin to the next.



The 3 bin compost system. Each bin holds compost materials at different stages of decomposition



Project Objectives

- 1) Teach locals a low-cost manual well drilling method
- 2) Provide a reliable drinking water source by drilling a well
- 3) Improve public health by teaching water hygiene
- 4) Promote sustainable farming by working at an organic farm



Exposed soils on steep farms quickly erode in wet season



Washing clothes in a stream used for drinking water.

Background Since SAIWI began in 2000, 16 hydrophilanthropy projects in nine countries have been completed. Project funds come from private donations, grants, and fundraisers. SAIWI's most recent project took place in Nkambe, Cameroon where ~56% of Cameroonians do not have clean water to drink (www.unicef.org). In Nkambe severe wet seasons coupled with traditional farming (e.g. clear cutting on high slopes) causes erosion and low crop yields, while the dry season depletes water supplies. Nkambe locals get water from springs, streams, rainfall, hand dug wells, or pipe-borne water if it can be afforded. Streams and springs are not free of contamination and all water sources deplete or disappear in the dry season. SAIWI's project work addressed these challenges by empowering locals with education and technology capable of alleviating these problems.

Project Impact

This project was successful in improving life in Cameroon, as well as continuing SAIWI's pursuit to sustainably develop water resources in places of need. Our completed well is a clean water source for local families and schools. The well will also irrigate crops for food. SAIWI worked closely with locals to ensure education and technology was passed to the community. Town councilmen and farmers in Nkambe have begun drilling second and third wells since SAIWI's departure, tippy taps hang from latrines, and compost is being turned into soil.

