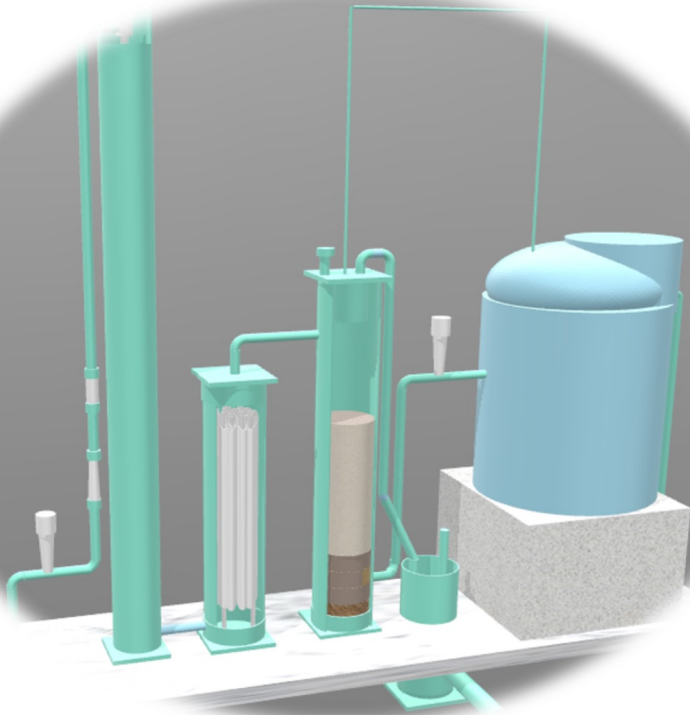




The ClariWash Filtration System

A new concept in water treatment for communities



The ClariWash Concept

The use of complex drinking water treatment processes is unsustainable in remote parts of the developing world due to a lack of access to technical support, skilled operatives, spare parts and treatment chemicals.

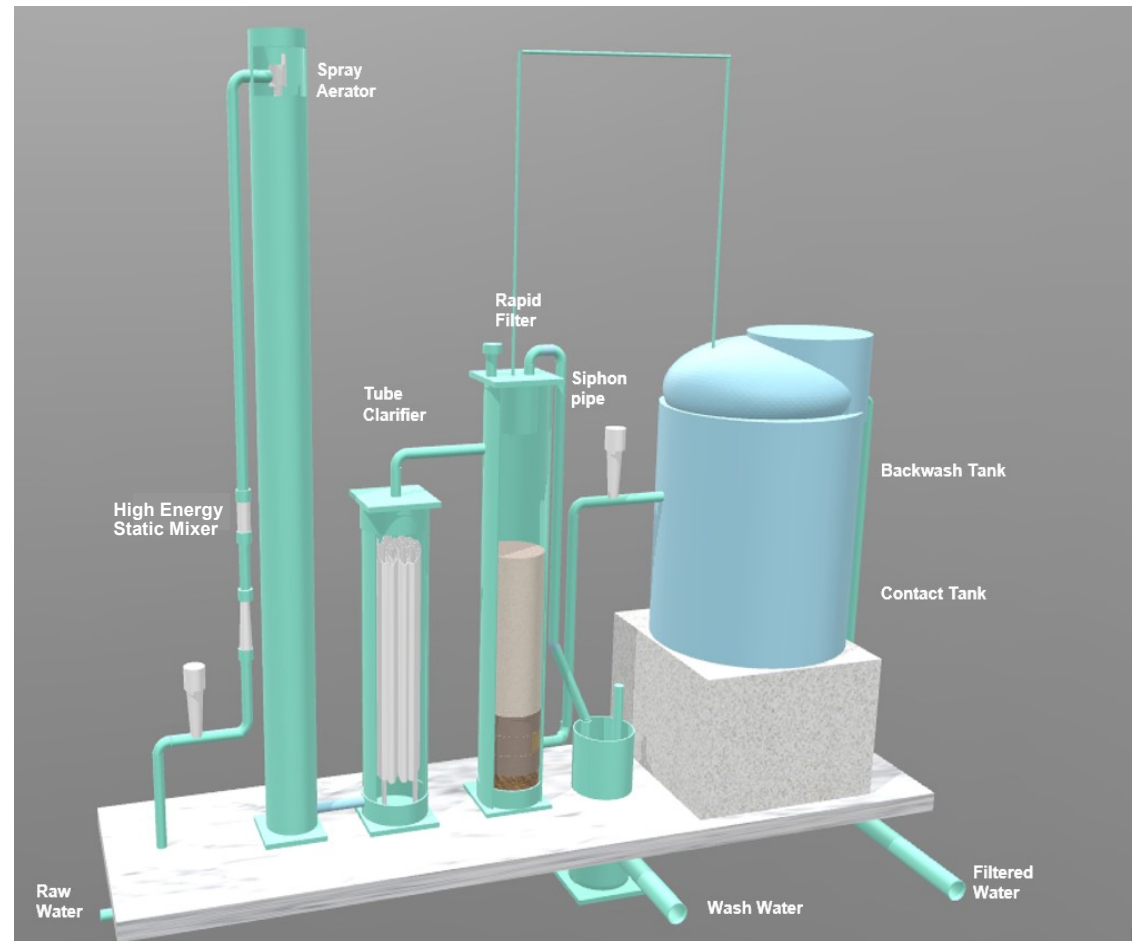
Development strategies have provided improved water supplies from “safe” water sources such as groundwater, capped springs, infiltration and impoundment mainly without treatment. Aquifers can become polluted and shallow wells easily contaminated. A population may rely on an untreated contaminated surface water source, rather than a new borehole, because it tastes better, without understanding the hidden dangers.

An iron laden source may be neglected because the water appears dirty - a treatment capability could make this acceptable.

I have attempted to address some of these issues by developing an appropriate low cost community water treatment system termed the ClariWash filtration system. Benefits are:

- No complex parts, no moving parts
- Low maintenance, low cost
- Local build without a manufacturing process
- Readily transportable.
- Self-washing clarifier & filter
- No control system or manual washing

The arrangement includes aeration and disinfection targeting removal of micro-biological pathogens, turbidity, suspended solids, particulate iron.



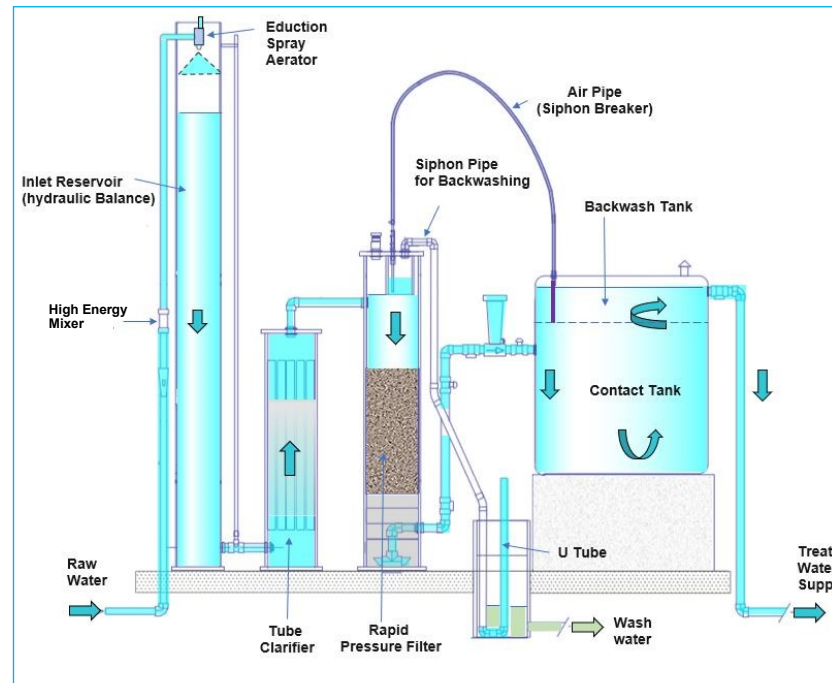
System Operation

The process comprises:

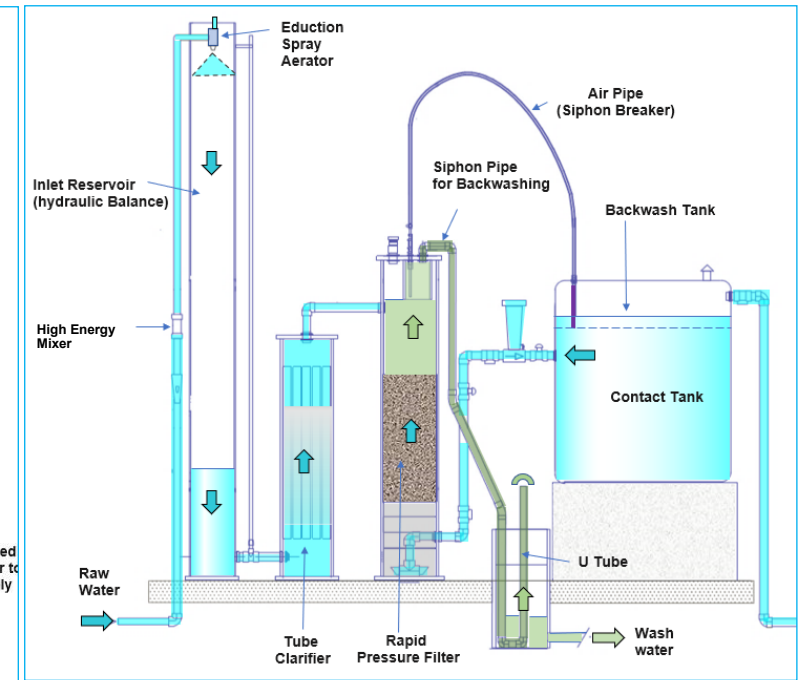
- High energy static mixer
- Aeration
- Clarification
- Rapid filtration
- Disinfection

In forward flow the level rises in the inlet pipe as the filter clogs. The U tube provides a back-pressure acting as a manometer.

Forward Flow



Backwash Mode



The system reaches maximum driving head when the U tube water level is fully depressed and the inlet pipe water level is at a maximum. At this point, U tube activation occurs as air bubbles are pushed around the base of the U tube initiating the priming phase. This phase has two functions: (i) siphon priming (ii) flush-out of the tube clarifier. The settled solids in the tube clarifier are flushed over the siphon to the waste channel by-passing and helping reduce loads on the filter. This has the effect of removing contaminants and increasing filter run times. As the siphon continues to operate it reduces the water level in the inlet pipe causing negative pressure to occur and reversing flow through (backwashing) the filter. The filter backwash operates for a few minutes removing trapped sediments and turbidity. It completes when the water level in the backwash tank reaches the bottom of the air pipe causing the siphon to be broken. Forward flow then resumes with effectively a delayed start (time to refill inlet pipe) which protects against start-up turbidity. The filtered flow first fills the backwash tank before flowing again to supply.



LABORATORY TESTING TO PROVE HYDRAULICS



SPRING WATER SOURCE



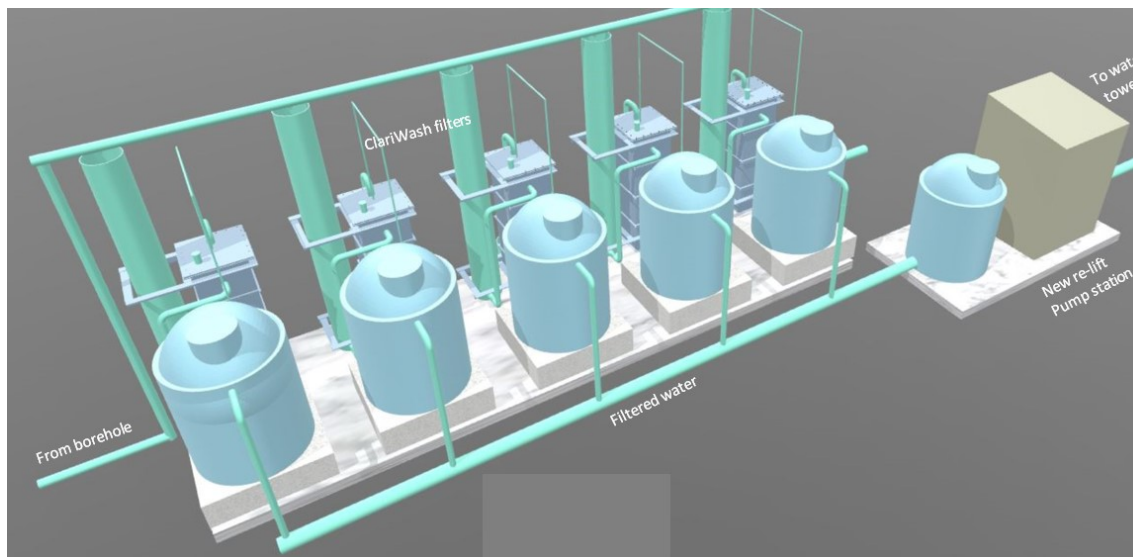
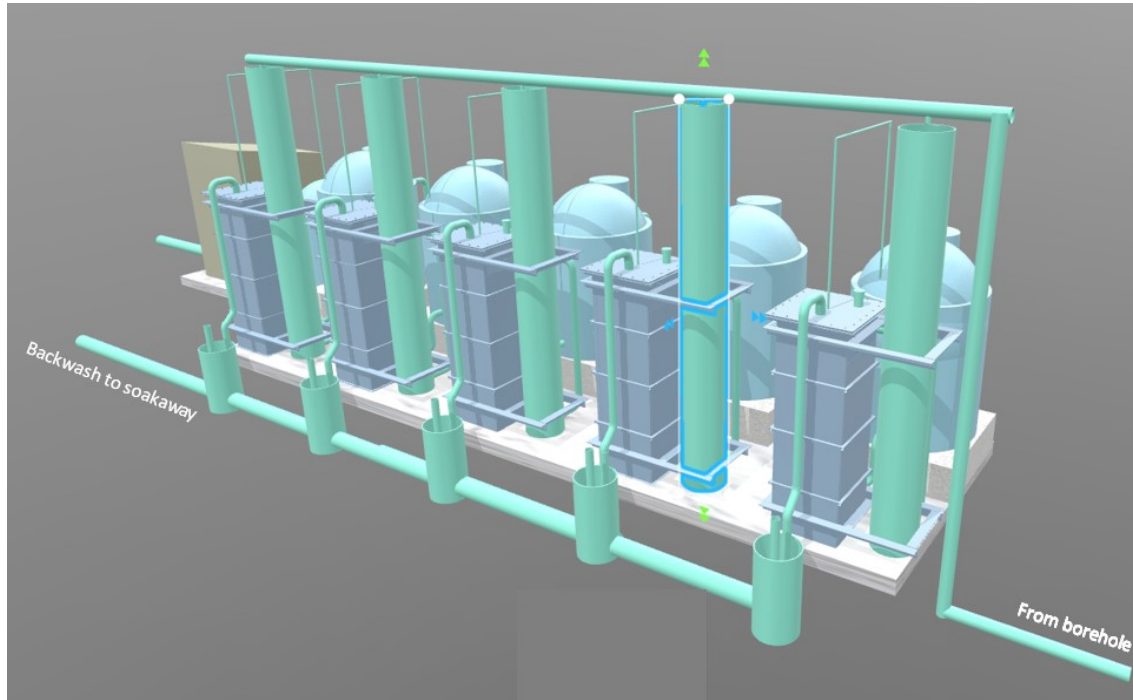
CARRYING FILTER COMPONENTS

Testing and deployment

The ClariWash filtration system is intended for use in urban & rural settings for development and disaster response. It is early stage technology and further testing and trialling will improve knowledge of setting up the system



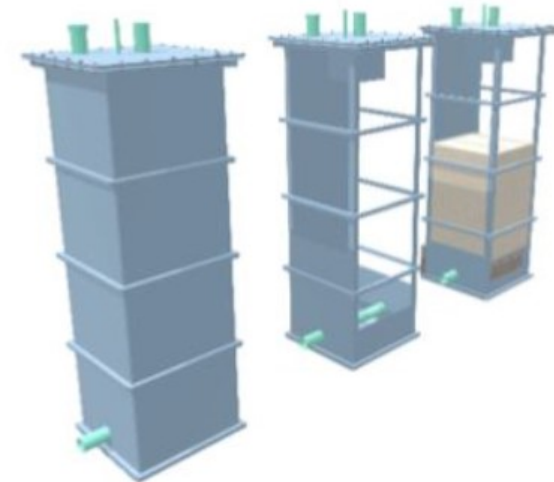
INSTALLING CLARIWASH FILTERS - WESTERN UGANDA (FOR CED)



Potential for Scaling Up

Subject to further prototype testing the system could be built to larger sizes and capacities

The arrangements shown are from a proposal by WaterReach for water supply to part of the Bidi-bidi refugee camp in northern Uganda. A bank of 5 filters are designed to provide an output of up to 430m³/day (for GAIND & Acord)



WaterReach is a not for profit company. It is seeking to link with local technical groups, charities, NGO's, local water authorities and others who would like to be involved in further adaptation, testing and deployment of the ClariWash system.

**In Support of UN Sustainable Development
Goal No 6 - Clean Water and Sanitation**

*“Start by doing what is necessary, then do what is possible
and suddenly you are doing the impossible”*

Attributed to St Francis of Assisi



Solutions for Development and Disaster Response

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