THE GLOBAL UPLIFT PROJECT

A Model for *Clean Water for Africa™*

A TGUP White Paper

OVERVIEW

Water is life. Clean water is good life. Dirty water is bad life, or death. Yet, more than 2 billion people drink contaminated water every year. A million die from it. Tens of millions are made sick. The tragedy is that this is entirely preventable.

Part of the problem is that contamination in water varies. Some contaminants are inorganic: ammonia; nitrates; sulfates; etc. Some are organic: E. coli; Dysentery; Cholera; Diphtheria; Coliform; etc. Both types of contaminants are debilitating. In the right concentration, both can be deadly.

The least developed areas suffer the most contamination. That's what "least developed" means: not having the infrastructure to provide clean water which is the first element required for healthy human growth. Indeed, the absence of reliable clean water is the single greatest barrier to human development because without it, no growth, no effort, no industriousness can prosper. Unless the problem of clean water is solved, human development in underdeveloped areas will falter, and fail.

The good news is that contaminated water is relatively easy and inexpensive to fix, especially in the context of schools, where children gather. The cost is around $.17 (seventeen cents) per child, per year. A "point-of-service" approach is much cheaper than the cost of sickness and death. It is vastly lower than conventional solutions using centralized purification plants and hub-and-spoke distribution systems common in Western countries.

The conclusion is arresting: providing clean water is one of the most effective—and cost-effective—public health options available to the developing world. The Global Uplift Project (TGUP) is providing WHO-quality purified water to schools in Uganda for $.17 per child, per year. We will soon take this program to the rest of Africa.

HISTORIC SOLUTIONS

Humans have to drink water. There is no alternative. If it is foul and there is no other, they will drink it. They have to remain hydrated to survive. Dealing with contaminants is secondary to surviving.

In many parts of Africa, people's only recourse to water is what runs in creeks. It's where all the animals go to drink and have since the beginning of time. That actually suffices for many people.

The reason is that people—like animals—have adapted over millennia to their environment. They have developed immunities to naturally occurring pathogens in the water. With economic development, however, toxic inorganic contaminants show up, especially in areas with agricultural runoff. Then, adaptation cannot make the water potable. Drinking it becomes hazardous to health.

Another common recourse when there is no other source is to harvest water, either by digging huge ponds to collect it from rainwater, or from smaller, naturally occurring depressions where it puddles. This supply is tenuous—dependent on the onset of rain and subject to evaporation. It is not a reliable solution. And, the hazards mentioned, above, of contaminants from agricultural runoff, still apply.

Another common, more industrialized solution is to drill a well. This requires thousands of dollars for specialized mechanical drilling equipment. One of the vagaries is that water tables vary in terms of how deep they are, if they are there at all. This can make drilled solutions unpredictable and exorbitantly expensive.

Well water might also have become contaminated by seepage from agricultural runoff. And, the drilled water will typically need to be pumped and stored in industrial tanks because it is not feasible to operate pumps according to the whimsical timing of when people need the water.

TGUP'S APPROACH

As can be seen, there are three conditions for a safe, workable clean water system: sufficiency; reliability; purity. TGUP is working with public schools in the Kampala, Uganda area to help meet these conditions.

The reason for choosing schools is that sufficiency and reliability are usually already addressed by public authorities. Additionally, there are enough people (children) to absorb the overhead of professional, engineered approaches to purity, which is critical.

The project is conceived, funded, and overseen by **The Global Uplift Project**. Our Ugandan partner, **Nsawo Community Development Project** (NCDP), handles installation and reporting. The project uses the patented water filtration system of Netherlands-based **Sensiblue**. Ugandan national university labs test every installation for post-installation purity.

THE TECHNICAL SOLUTION

The **Sensiblue** "point-of-service" system delivers municipal-scale, urban quality water filtration to rural school communities at a small fraction of the cost of alternative systems such as ultraviolet or thermal treatment.

The **Sensiblue** system:

- Is powered by the pressure in the water system: **no electricity required**.
- A turbine creates electrolysis, turning salt (NaCl) into chlorine.
- The turbine strips out the Sodium (Na) atom, leaving pure Chlorine (Cl) as the active disinfectant.
- One pound of salt filters 11,000 gallons of water to WHO quality standards.
- The system delivers 99% lower operating costs and 95% lower maintenance costs compared to other systems. This is a major "plus" for cost constrained schools in Africa.

Uganda Clean Water Cost Estimates

Number of schools	27
Children per school (average)	440
Children helped in year 1	11,880
Cost per installation	$1,089
Number of installations	27
Initial Program costs	$29,403
Cost for maintainance per year	$84
Number of years	10
Number of schools	27
Total maintainance costs	$22,680
Total costs, 10 years	$53,083
Children helped, 10 years	118,800
Cost per child helped, per year	$0.17

RESULTS TO DATE

TGUP and NCDP have completed installations at 23 schools in the Kampala, Uganda area. Each installation included all filtration equipment, piping, secure housing, and dispensing equipment. Post-installation water quality tests were conducted by the Ndejje National University Water Research and Development Center in Kampala. The results are:

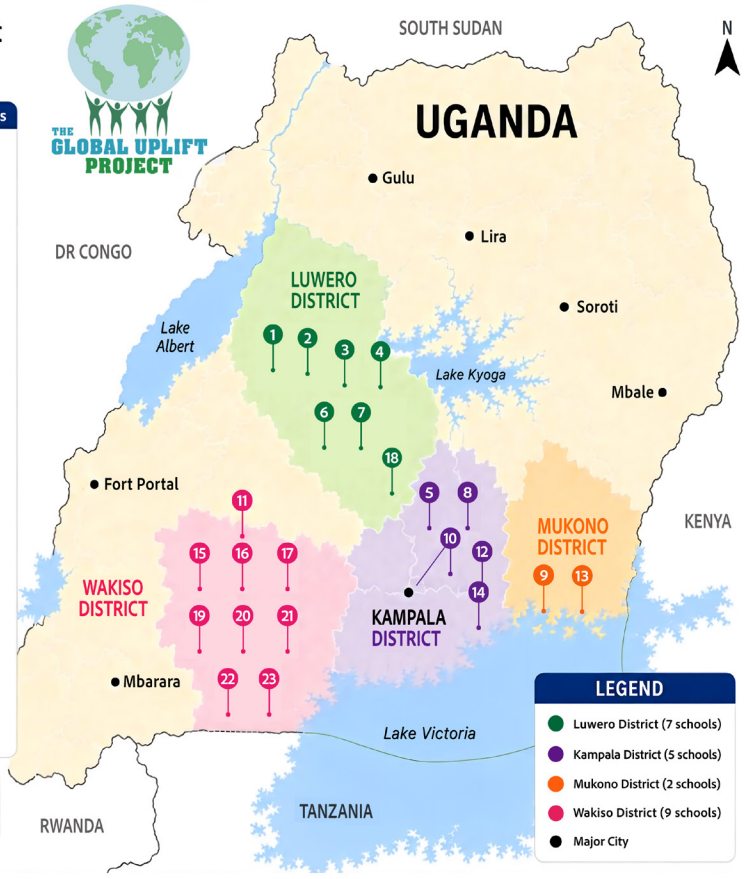
- WHO purity standards met including for ammonia, nitrates, sulfates, and turbidity.
- 99.9% reduction in viruses. 99.99% reduction in bacteria.
- 100% reduction in E. coli and coliform organic pathogens.
- Combined population of 10,127 students served, so far.
- Cost per child served (over the 10-year expected duration of the systems) is $.17 (seventeen cents) per child, per year.

TGUP and NCDP, in collaboration with Sensiblue, will continue to monitor the installations. Then, they will be ready to extend the system to other African countries looking for cost effective clean water systems for public schools.

sensiblue
we clean it, you drink it

The Global Uplift Project

No.	School	District	Students
1	Ssaku Secondary School	Luwero District	529
2	Kaswa Muslim Primary School	Luwero District	392
3	Blessing Junior School	Luwero District	471
4	Vision Junior Primary School	Luwero District	568
5	Cecilia and Paul Education Center	Kampala District	223
6	God's Grace Primary School	Luwero District	417
7	Luwero Islamic Secondary School	Luwero District	527
8	Little Wonders Primary School	Kampala District	476
9	Christland Junior School	Mukono District	223
10	Hopeful Hearts Children Academy	Kampala District	236
11	Kira Girls' School	Wakiso District	615
12	Kabowa C/U Primary School	Kampala District	856
13	Sami Primary School	Mukono District	452
14	Merryland Nursery and Primary School	Kanyanya, Kampala District	321
15	St. Aloysious Secondary School	Wakiso District	194
16	St. Jonah High School	Wakiso District	632
17	Blessed Junior School	Wakiso District	471
18	St. Kizito Katikamu Kisule Secondary School	Luwero District	830
19	Good Foundation Preparatory School	Wakiso District	523
20	Zaid Junior School	Wakiso District	273
21	St. Annette Primary School	Wakiso District	268
22	Grace High School	Wakiso District	385
23	MaryHill Way Grammar School	Wakiso District	245

TOTAL SCHOOLS 23 | TOTAL STUDENTS 10,127

* Map locations are approximate based on district headquarters or known school locations.