Akvo Foundation Designs Large-Scale Water Quality Monitoring System in Sierra Leone Using CBT *E. coli* Kit

Akvo Foundation has worked with over 20 governments and 200 organizations in more than 70 countries to improve implementation of development projects and decision making using data. Akvo's combination of data tools, services, local expertise and sector knowledge helps their partners improve the management of water, sanitation and agriculture. www.akvo.org

Problem

In Sierra Leone, less than 40% of households have access to safe drinking water. Fecal contamination of drinking water poses a major public health threat.

The lack of large-scale, reliable, real-time data on water quality has made it difficult for the Sierre Leone government to effectively address and solve its nation's water quality crisis. Drinking water quality has not been regularly tested at the household level.

Akvo Foundation, in partnership with the Sierra Leone Ministry of Water Resources and UNICEF, is monitoring household drinking water quality in 1100 communities and at 600 different water sources. This project is one of the first large-scale water quality assessments in Sierra Leone.

Solution

Akvo devised the Sierra Leone sampling strategy, survey design and monitoring framework. Data was captured by the smart phone app Akvo developed, Caddisfly, which sits atop Akvo's data platform to capture, monitor, analyze and visualize data at-scale. Caddisfly supports the Aquagenx CBT *E. coli* Kit as its microbiological water quality test-of-choice.

The survey included 1100 UNICEF supported communities. Three randomly selected households per community were tested on the severity of *E. coli* contamination using the Aquagenx CBT *E. coli* Kit together with Akvo Caddisfly. 600 drinking water sources recently built by UNICEF were tested on 11 different parameters, including nitrate, fluoride, iron and potassium.

Over a 10-day period, 20 Ministry of Water Resources mappers were trained on the use of mobile water quality testing using Caddisfly and the Aquagenx CBT *E. coli* Kit for microbiological testing. These mappers were then responsible for training the other implementing partners, reinforcing the program's sustainability. A total of 123 people were trained in data collection and analysis amongst 11 implementing partners for this large-scale survey.

Methodology and Strategy

E. coli test results at the household level will be representative of the 1100 communities with a 99% confidence level. The results will give insight into the following:

1. If the source water in targeted communities is safe to drink and meets World Health Organization (WHO) guidelines for drinking water quality
2. If household water is safe to drink and meets WHO guidelines for drinking water quality
3. Impact of community led total sanitation and behavioral change hygiene practices on the drinking water quality of households
4. If there is an improvement in water quality amongst households over time

Water quality test results were also combined with water and sanitation risk assessments. These comprehensive, nuanced datasets will provide deep insight into the status of WASH services in Sierra Leone, effectively guiding the next steps of the project.

Conclusion

Mert Blommestijn, Project Manager Water Quality at Akvo Foundation says, "We selected the Aquagenx CBT *E. coli* Kit as our microbiological water quality test after an exhaustive study of available tests. Nothing matches its ease-of-use and reliable quantitative results, or its cost effectiveness, especially for low resource, rural areas. We are excited to partner with Aquagenx for the Sierra Leone survey."

Blommestijn continues, "By combining the easy-to-use Aquagenx CBT with the Caddisfly app, we are able to give communities in remote areas instant and valuable feedback on drinking water safety based on WHO health risk categories. Therefore, the test results can be optimally used both at the national and local level."