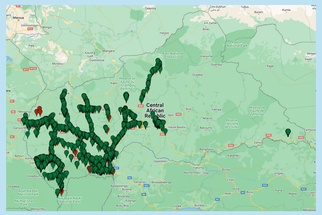
Sustainable Water Services: Findings from 10+ years of Circuit Rider Maintenance Programs in Fragile Contexts

Megan Lindmark, EOS International **Adrienne Lane, Water for Good**

Central African Republic

With an estimated population of 6 million people, the Central African Republic is a sparsely populated, landlocked, and remote country. Population density is only 9 people per sq km.



There is a recent history of civil conflict (2012-2015) and the populations still faces chronic insecurity. The average income is $460/yr and it ranks 188/189 in the Human Development Index. JMP estimates 31% of the population has basic water services (MICS data collected in 2018). Within this context, the maintenance services currently cover an area that is roughly the size of Uganda, with an estimated 880,000 people benefiting from our services each year.

Service Delivery Model

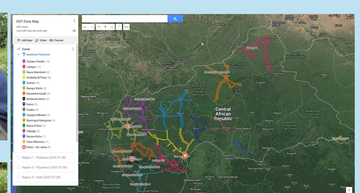
Water for Good provides professional maintenance services and electronic monitoring in order to improve the reliability of basic water services

Preventative Maintenance and Repairs
Technicians travel to remote locations on 21-day circuits. The aim is to visit each handpump twice per year and communities are expected to pay a fee per visit.

Monitoring Functionality
Circuit riders complete on-site electronic reports with time-stamped, photo verification of handpump functionality.

Replication
Water for Good has adapted the circuit riders model to operate and maintain 28 piped schemes serving and estimated 60,000 people.

Capacity Building
Local, regional, and national authorities can access water point data for coordination and planning. Local, expert circuit rider technicians apprentice new recruits.

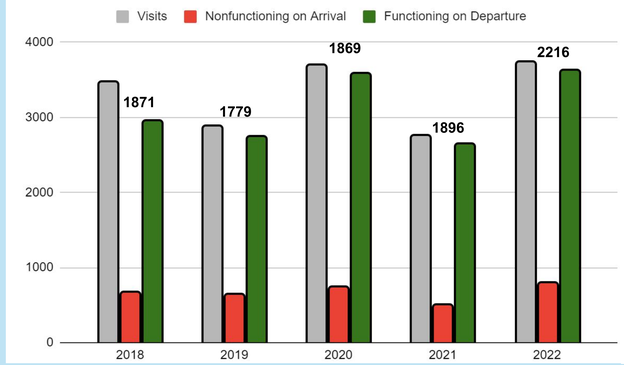


Top left: Technician completing a repair on a handpump that has been pulled out of the borehole.

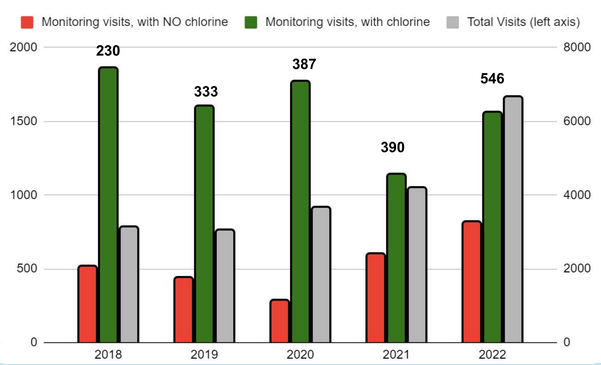
Bottom left: Technician completing an electronic report during a maintenance service visit.

Map: Handpump Service Circuits (Zones) and Water for Good operating bases in the Central African Republic.

WfG System Functionality



EOS Chlorination Rates



Financial Models

Water for Good's financial results
- Communities pay per maintenance visit for hand pumps and a volumetric rate for piped schemes
- On average, 30% of communities with handpumps made payments while, in contrast, communities with piped schemes averaged an 80% collection efficiency

Innovative mechanisms for financing:
- Results based funding flips the typical funding paradigm and provides service providers with funding for results reported each quarter
- Water for Good and EOS International use Uptime results based funding to supplement local revenue for their circuit rider models
- For more information on Uptime Global's funding model please attend the Wednesday afternoon side session: **Accelerating progress on rural drinking water with results-based funding @1:30 pm**

EOS International's financial model
- EOS invests upfront in building the capacity of community water boards
- EOS sells chlorinators and chlorine tablets at a subsidized rate and uses this revenue coupled with external funding to cover the circuit rider model
- In the last 10 years only 11% of lapses in chlorination were due to communities being unable to afford chlorine tablets

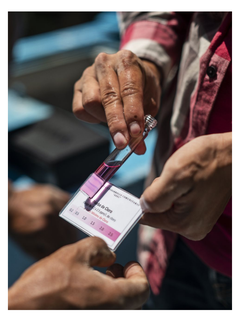
Both circuit rider programs cost approximately **$1.00/person/year**

Future innovation

Learning to operate and calibrate an erosion chlorinator installed on a piped water scheme in the Central African Republic.

Pilot installation of satellite remote monitor for piped scheme at the Water for Good base camp in Berberati, Central African Republic

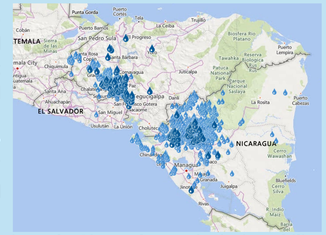
pH, oxidation reduction potential, and tank level sensors and monitoring results shown in data platform: Hydrosphere for a community in rural Honduras



EOS transitions monitoring responsibility to local community health volunteers within two years of working in a community. This allows circuit riders to focus on technical assistance and training. In year three, circuit riders are able to offer services at a net cost of $0/person with chlorine sales making up the difference.

Central America

Central America is home to 181 million people, and over 45 million are without access to safely managed drinking water. Among the 14,000 drinking water systems covered by EOS' service delivery area in El Salvador, Nicaragua, and Honduras, 85% are contaminated. Given the region's instability resulting from ongoing refugee crises, autocratic regimes, and the impact of climate change, securing access to safely managed drinking water can pose significant challenges. EOS currently operates in 2,000+ communities serving over 1 million people and partners with local community water boards to provide professionalized maintenance services including in-line chlorination, technical assistance, and water quality monitoring to increase the number of communities with safe drinking water.



Service Delivery Model

EOS provides ongoing external support to community water boards to establish best management practices, and ensure sustained access to safely managed drinking water

Water Quality Analysis
Initial drinking water tests are performed to establish baseline need. 85% of communities' water sources are contaminated when initially tested

Capacity Building
Community water boards receive regular training, both before chlorinator installation, during, and long after on key topics such as O&M

Water Treatment
Community water boards purchase passive in-line chlorinator to treat drinking water at the community scale, EOS technicians help install chlorinators

Chlorine Distribution
EOS sells chlorine tablets directly to communities or through EOS chlorine distribution centers for sustained use of chlorinators

Technical Assistance
Circuit riders provide sustained technical assistance, whenever challenges arise for community water boards related to operation and maintenance of the systems

Water Quality Monitoring
Circuit riders provide monthly monitoring support to evaluate chlorination levels and sustained use of chlorinators, and report results back to community leaders and municipal government

Circuit rider performing chlorine monitoring

EOS ADEC chlorinator (Agua de Calidad) model, installed at a community water tank in Honduras