Funding chlorine dispensers for community water supply through carbon finance

RWSN Forum, 29 November 2016

south pole group

South Pole Group

Chlorine Dispensers

Evidence Action / Dispensers for Safe Water

Problem

- **Diarrhea** is leading cause of **childhood mortality**
- Chlorine exists, **but people won't pay** for it
- People **forget to use it** regularly
- **Infrastructure solutions break**
- Rural households excluded

Solution

- **Treat with chlorine**, which kills 99.9% of pathogens & reduces diarrhea by 40%
- Chlorine keeps **safe** from **recontamination**

- **Free to users**, resulting in 6x usage
- **Bulk supply reduces costs** to < $0.50 per person at scale

- Rigorously tested **community education** & **local promoter**
- Dispenser **placement visual reminder**

- On-going **service** delivery & maintenance
- **Rural distribution network**

Project Area

Districts: Budaka, Busia, Butaleja, Kibuku, Manafwa, Namutumba, Mbale, Pallisa, Sironko, Tororo

dispensers: 5,655

people with access: 1.7 million

Carbon Credits

- Greenhouse gas emissions:
  2.5 tCO_2 my flight to the RWSN Forum
  66,915 tCO_2 of UNICEF (2014)
  48,710,000 tCO_2 of Switzerland (2014)

- Idea of carbon offsetting:
  Pay for a project that reduces emissions, e.g. forestry, cookstoves
- Tradable unit: carbon credit (= 1 ton of CO_2)
- Different standards that certify emission reductions
- Emission reduction calculation based on approved methodologies
- CDM and Gold Standard registration based on AMS.III-AV (version 03)

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Methodologies are approved by the carbon standard

Baseline Emissions

Boiling of water: 5,300 L ≈ 1 tCO_2

Stoves Used

- Firewood use: > 95%
- Use of three stone fires or unimproved stoves: > 90%
- Assumed efficiency of unimproved stoves: 10%

Emission calculation

- Specific Energy Consumption (heating the water from 20°C to 100°C and boiling for 5 min): approx. 3,400 kJ/L
- Emission factor: 81.6 tCO2/TJ
- Fraction of non-renewable biomass (Uganda): 82%

Baseline Emissions

Boiling of water: 5,300 L ≈ 1 tCO_2

Baseline data are validated by an auditor

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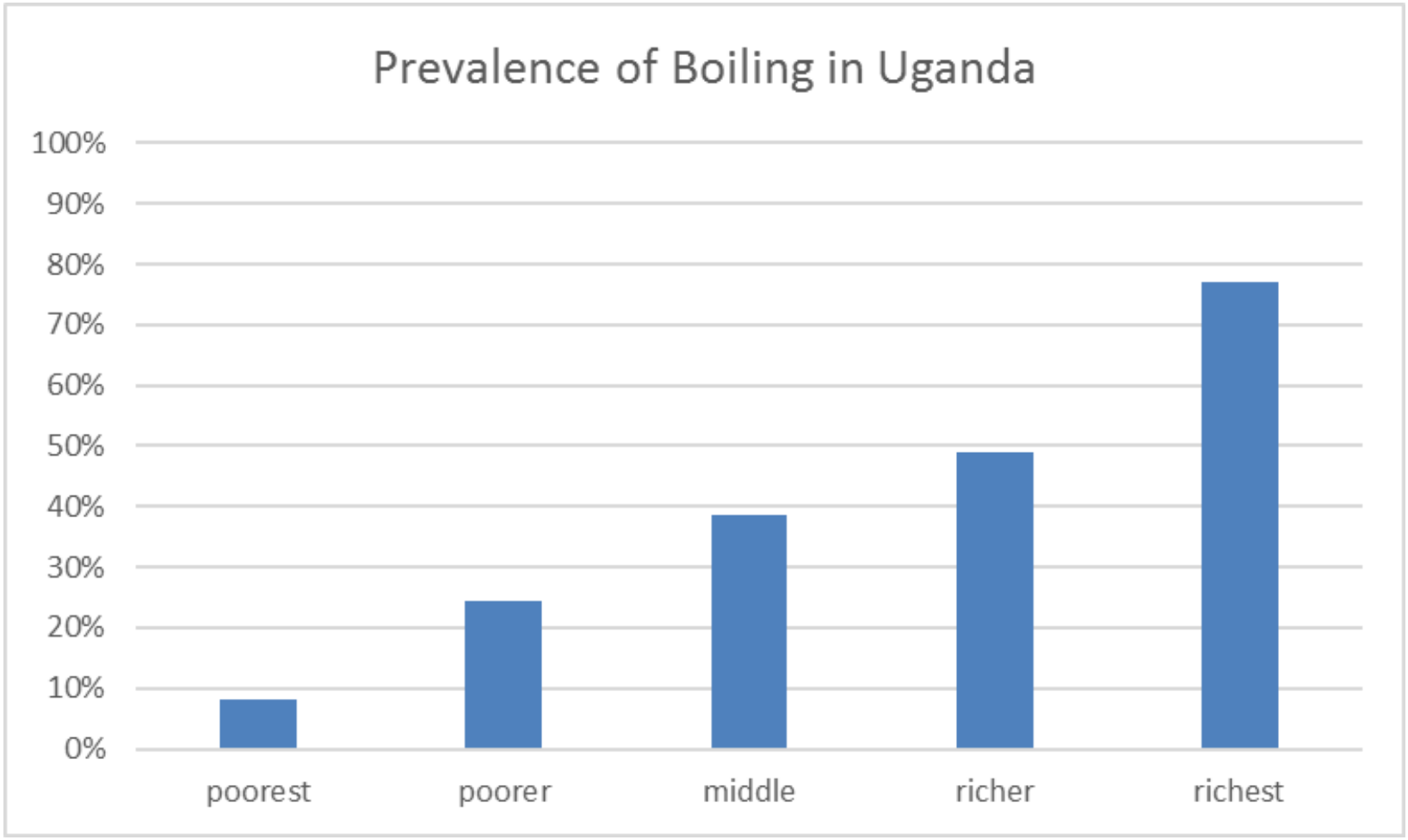

Source: DHS Uganda, 2011

Project Monitoring (1)

The total amount of safe drinking water consumed needs to be established.

Chlorine consumption

- Records are collected for all chlorine deliveries to a dispenser (5 L chlorine jerricans and 3 ml chlorine per 20 L water = 33,333 L per delivered 5 L jerrican)
- Deduction of % chlorinated water used for other purposes than drinking
- Cap at 3.5 L per person with access to a dispenser (around 20 L per household per day)

Water quality

- Water quality tests at household level
- Total chlorine residual is tested in stored drinking water to determine users
- E. coli tested using the IDEXX Quanti-Tray method
- The applied methodology accepts a quality threshold < 10 CFU/100 ml for E.coli

Project Monitoring (2)

Monitoring period	# Functional Dispensers	Chlorine consumption (5 L jerricans)	Water quality (< 10 CFU/100 ml for E.coli)
1st monitoring period (17/07/2014 to 31/01/2015)	1,049 (out of 1,150)	4,983	93.5%
2nd monitoring period (01/02/2015 to 30/09/2015)	2,023 (out of 2,163)	14,055	92.6%
3rd monitoring period (01/10/2015 to 31/05/2016)	2,105 (out of 2,163)	12,350	95.9%

The quantity of consumed safe water can be calculated!

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Monitoring data are verified by an auditor and cross-checked by carbon standard

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Carbon Credit Sales

First carbon credits issued in April 2016.

The carbon revenue allows Evidence Action to provide free access to chlorine for rural communities.

Sales of carbon credits

- Issued carbon credits need to be sold in order to generate revenue
- To sell carbon credits a broad network of corporate and public buyers is essential
- Carbon credits from attractive projects can be sold for above market prices
- Still, even after the successful outcomes in Paris the future of the CDM is uncertain
- Preferably a forward contract (with pre-defined carbon credit volume and price) can be signed with a client.

Revenue

- No “rules” about how carbon revenue is used
- Evidence Action uses carbon revenue for on-going O&M of the filters
- Carbon transaction costs are similar to NGO’s fundraising expenditures

Conclusions

- Carbon finance is able to cover costs that traditional donors and governments are often not willing to cover, e.g. operation and maintenance costs.
- The current situation of the carbon markets (i.e. prices below 1 USD per carbon credit) poses a risk to financing the operation and maintenance.
- Results-based finance: 5,300 safe water = 1 tonCO_2, carbon credit price gives also a price to water

Why is “Carbon for Water” Relevant?

1. Under the SDGs water quality is given increased attention and it can be expected that decentralized water treatment options will gain traction

2. The rural poor and most disadvantaged are most likely not able to cover the full costs of water treatment and some form of subsidy will be required.

3. Results-based finance using an outcome-indicator (e.g. water free of faecal contamination at the point of use) provides possibly the best incentives for implementing cost-effective measures to reach a maximum number of people with a given budget.

4. Carbon for water projects provide first concrete examples of results-based funded interventions and could be further expanded, or the learnings used for the development of similar new funding schemes.

Let’s Meet & Discuss!

- Interested to **compensate your organization’s carbon footprint** with high-quality carbon credits?
- Interested to **register your own water project** under a carbon standard?
- Interested to **explore results-based financing mechanisms** beyond carbon for safe water?

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