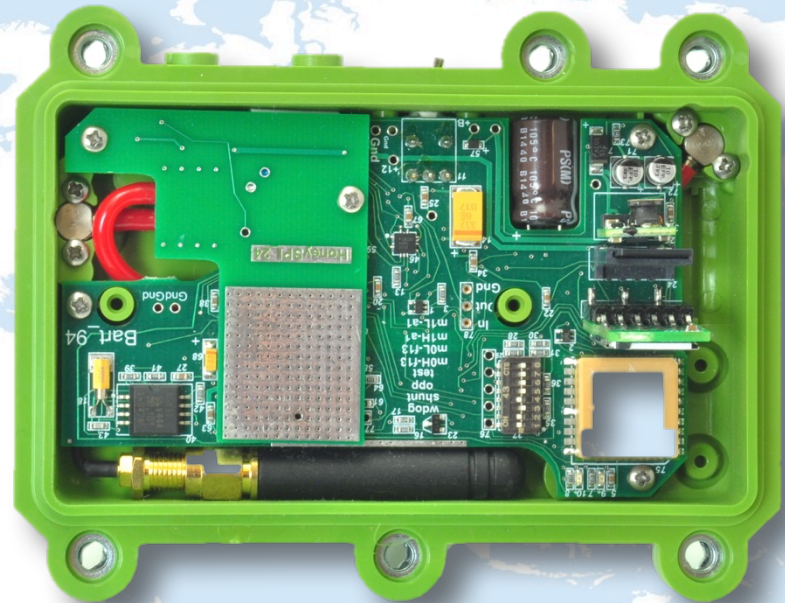




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A world map with a red dot in Rwanda. The map is centered on the Atlantic Ocean, showing the Americas on the left and Europe, Africa, and Asia on the right. A red dot is located in the eastern part of Africa, specifically in Rwanda. The text is overlaid on the map.

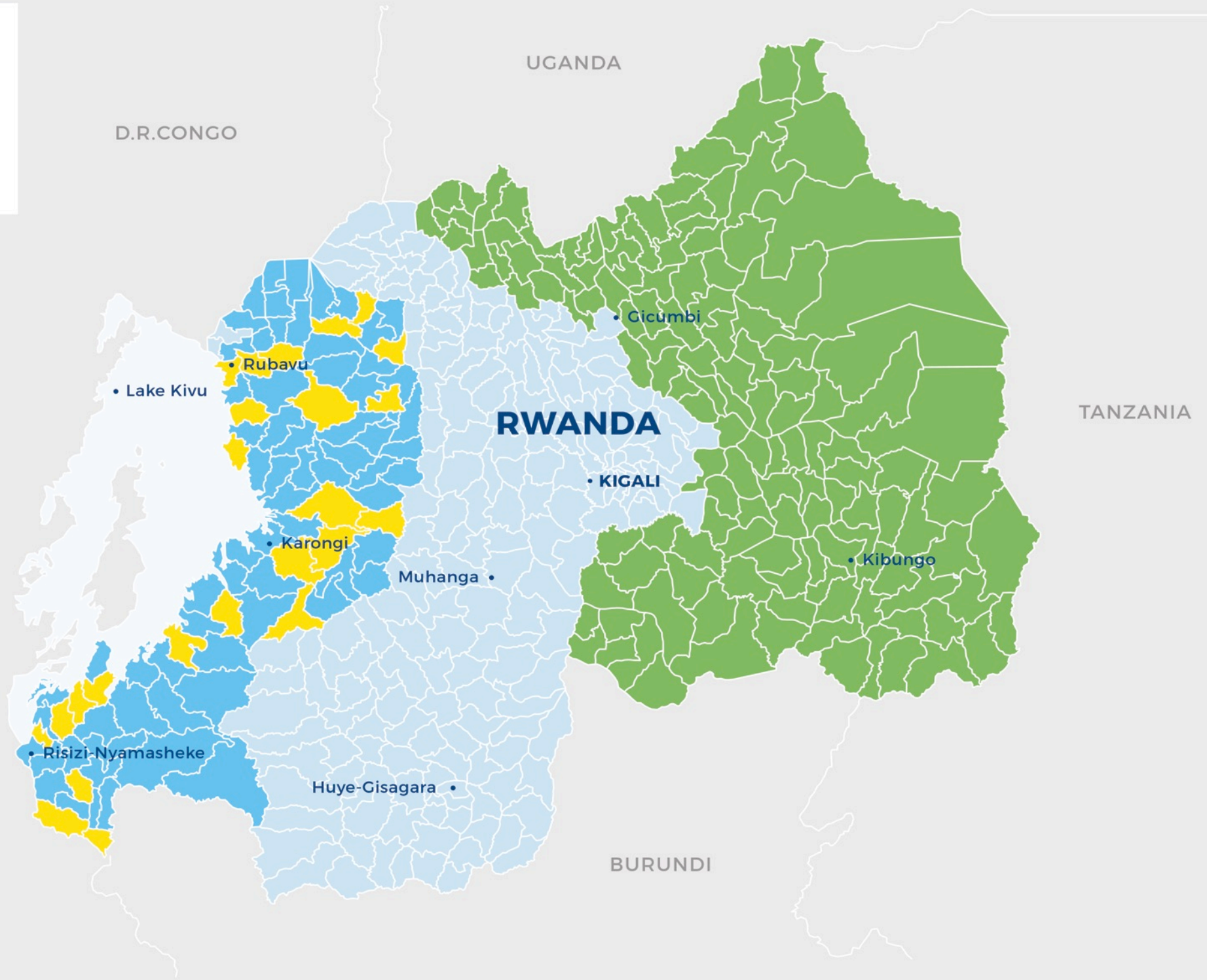
**Combining Sensors, Surveys, Observations
within a Health Impact Randomized
Controlled Trial in Rwanda**

LEGEND

CONTROL SECTORS

PHASE 2

PHASE 3





A young child in a blue and yellow plaid dress stands to the left of the stove, looking down at the ground.

The blue charcoal stove has the text "elAgua" printed on its side.

The woman is kneeling on the right side of the stove, feeding sticks of wood into the firebox. She is wearing a blue and white striped top and a black dress with colorful floral patterns.

A large metal pot sits on the ground in front of the stove, containing a dark, cooked substance.



LifeStraw
Modelo 208

NEBA



Recipients



Water Source



Treatment?



Treatment Method



Household Size



Baseline Stove



Fuel Type

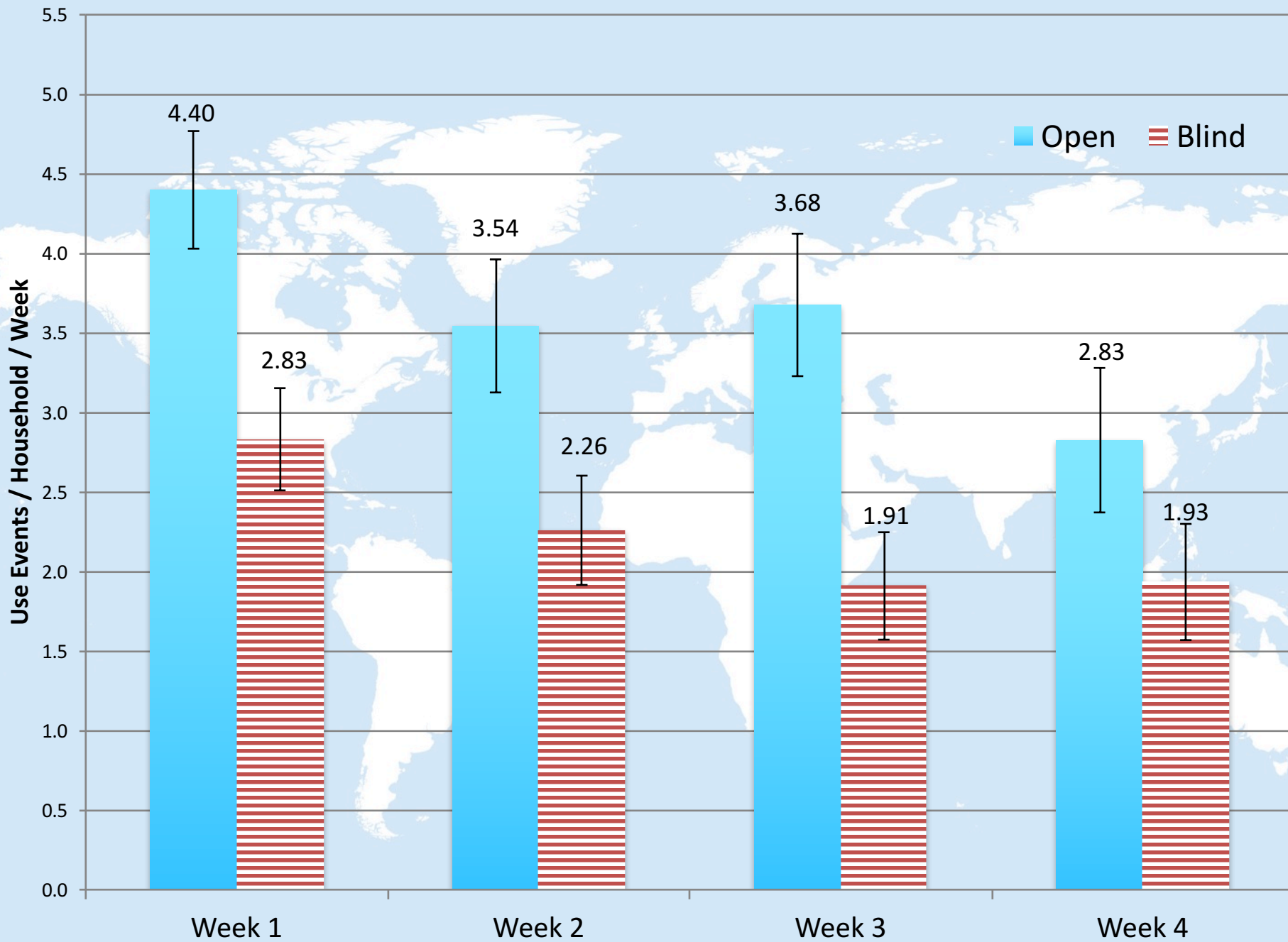


Cooking Location





Filter Use Events / Household / Week Controlling for Household Size - All Households





46%

reduction in
diarrhoea in
children under 5



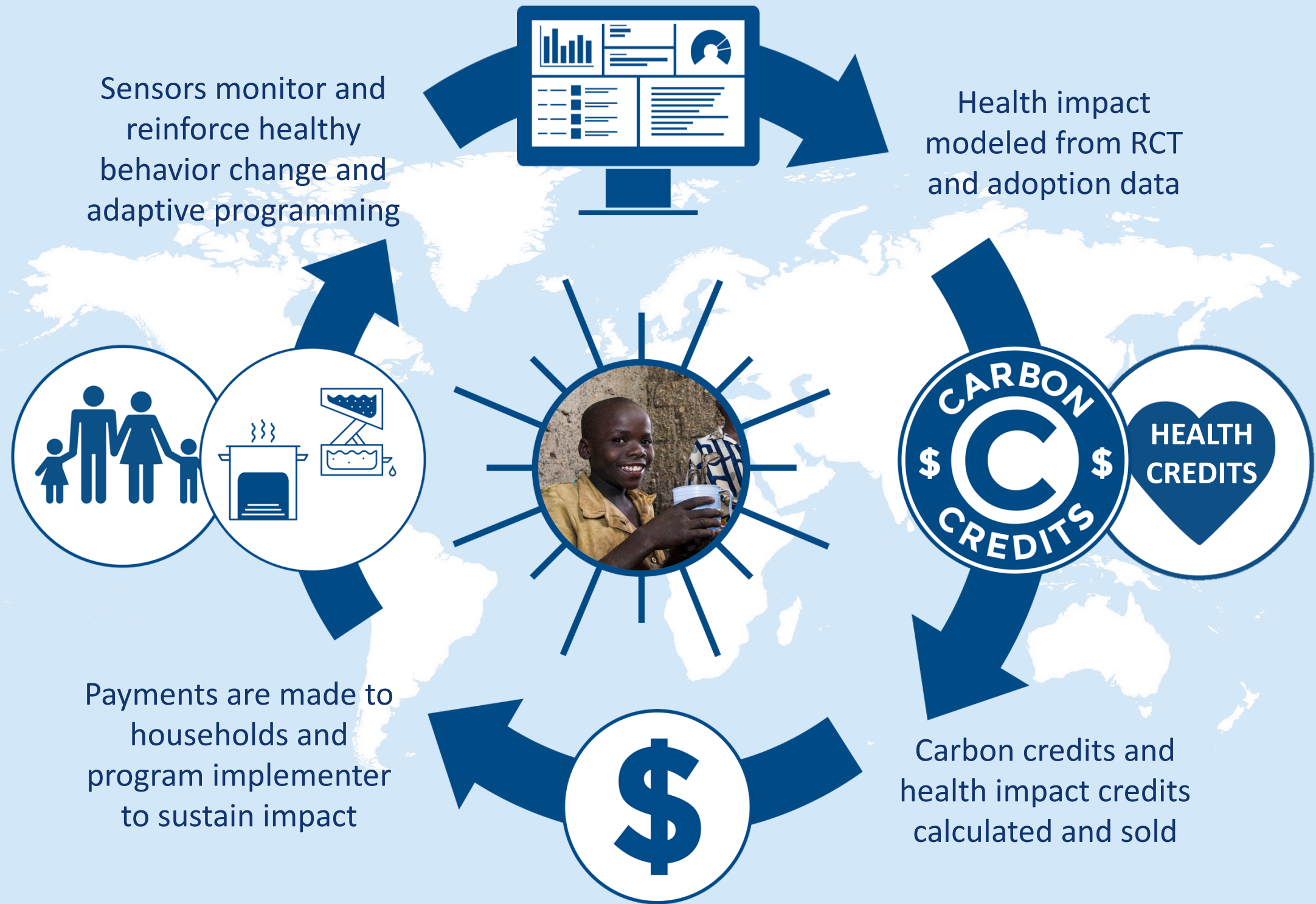
73%

reduction in
household air
pollution for families
cooking outdoors



27.7%

reduction in
cookstove emission
exposure among
children



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**Combining Sensors and Cloud Dashboards with
Technician Repair Services in a Longitudinal
Study of Water Pumps in Rwanda**





PUR
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Sanitation Intervention Utilization and Service Delivery

Sanergy Inc – Operations QAQC

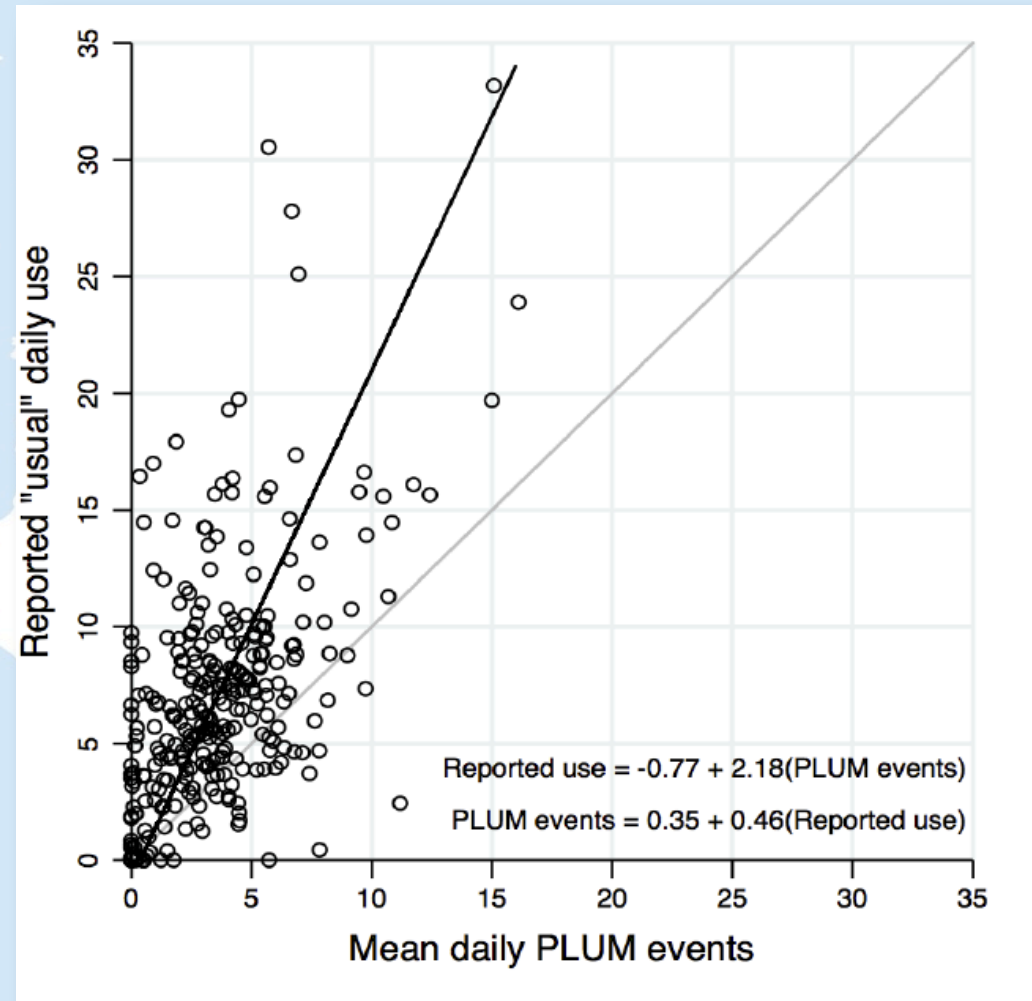


- Latrine operators scan RFID badges to request cleaning services.
- Cleaning staff scan badges to report servicing.
- Sensor detects high uses between service events and requests service.
- Service cases linked to Salesforce.



Latrine Use Monitoring – India

- 2-week installation periods.
- Comparison of concurrent survey responses.
- Mean reported use was 2x sensor-detected use.
- Poor agreement between survey and sensor data.



Sinha, Nagel, Thomas et al, 2016, AJTMH



**What Next: Institutionalizing Water,
Sanitation and Energy Services**

From Promises to Performance

Kenya RAPID

Project Budget: \$35 million

Duration: August 2015 – August 2020

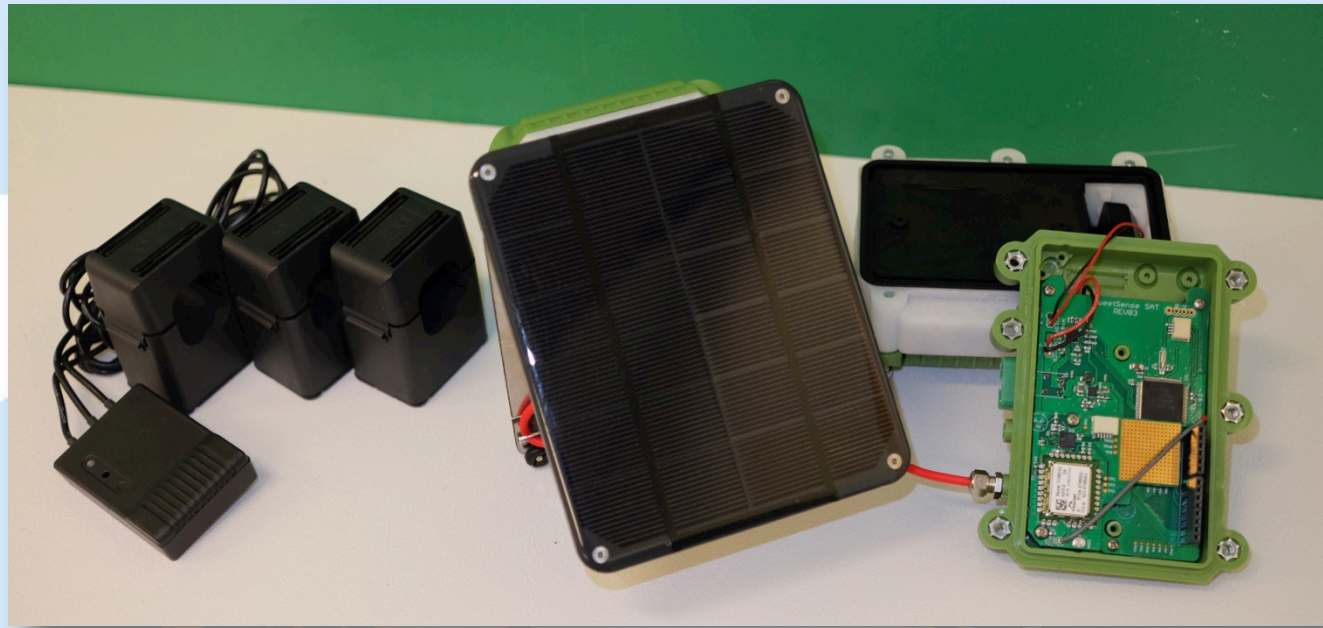
Coordinated by: Millennium Water Alliance

- County Ministries of Water, Agriculture, Livestock, Fisheries, Health and Education of Isiolo, Garissa, Marsabit, Turkana and Wajir
- National Ministries of Water, Agriculture, Livestock, Fisheries, Health and Education


- CARE
- Catholic Relief Services
- Food for the Hungry
- World Vision


- Acacia
- Aqua for All
- IBM Research
- SweetSense Inc
- The Coca-Cola Africa Foundation
- Vitol Foundation


- Swiss Development Corporation (SDC)
- United States Agency for International Development (USAID)




Decision Response Aids

 Pump Functional


 Low Water Volume

 Pump Off

 Pump

Site Selection
 Turkana - Borehole 9

Map



Water Volume Extracted (m3) per Day

Water Volume (m3) | Status

Legend: Water Volume (Blue), Status (Green - Functioning, Red - Pump Off, Orange - Sensor Off)

Date	Water Volume (m3)	Status
2016-09-15	0	Pump Off
2016-09-16	0	Pump Off
2016-09-17	0	Pump Off
2016-09-18	0	Pump Off
2016-09-19	65	Functioning
2016-09-20	0	Pump Off
2016-09-21	0	Pump Off
2016-09-22	0	Pump Off
2016-09-23	0	Pump Off
2016-09-24	0	Pump Off
2016-09-25	56	Functioning
2016-09-26	0	Pump Off
2016-09-27	0	Sensor Off
2016-09-28	181	Functioning
2016-09-29	650	Functioning
2016-09-30	673	Functioning
2016-09-30	738	Functioning
2016-10-01	797	Functioning
2016-10-02	656	Functioning
2016-10-03	550	Functioning
2016-10-04	575	Functioning
2016-10-05	773	Functioning
2016-10-06	691	Functioning
2016-10-07	700	Functioning
2016-10-08	581	Functioning
2016-10-09	674	Functioning
2016-10-10	674	Functioning

Weekly Weather Forecast

Day	Temp	Condition
Wed	13°C 26°C	Clear Sky
Thu	11°C 27°C	Clear Sky
Fri	12°C 27°C	Clear Sky
Sat	19°C 31°C	Light Rain
Sun	18°C 30°C	Light Rain
Mon	19°C 31°C	Light Rain
Tue	17°C 32°C	Clear Sky
Wed	18°C 30°C	Clear Sky

Pump Meta Data

MAC ID	Barcode	Serial #	Last Report	Location
POWER_SAT_300234064233850	05073	10786	Oct 11, 2016 00:02:51	Isiolo - Gnhapawoi
POWER_SAT_300234064236890	05070	10785	Oct 11, 2016 00:00:22	Turkana - Borehole 9
POWER_SAT_300234064234990	05072	10781	Oct 11, 2016 00:00:14	Isiolo - Lotiki
POWER_SAT_300234064230980	05078	10788	Oct 11, 2016 00:00:09	Turkana - Kapedo
POWER_SAT_300234064232850	05074	10787	Oct 11, 2016 00:00:09	Turkana - Napuu 3

