



**27th International World Water Day and Water Expo
celebration “Leaving No One Behind”
March 22, 2019**

Monitoring and management of climate resilient water services in the Afar and Somali regions of Ethiopia

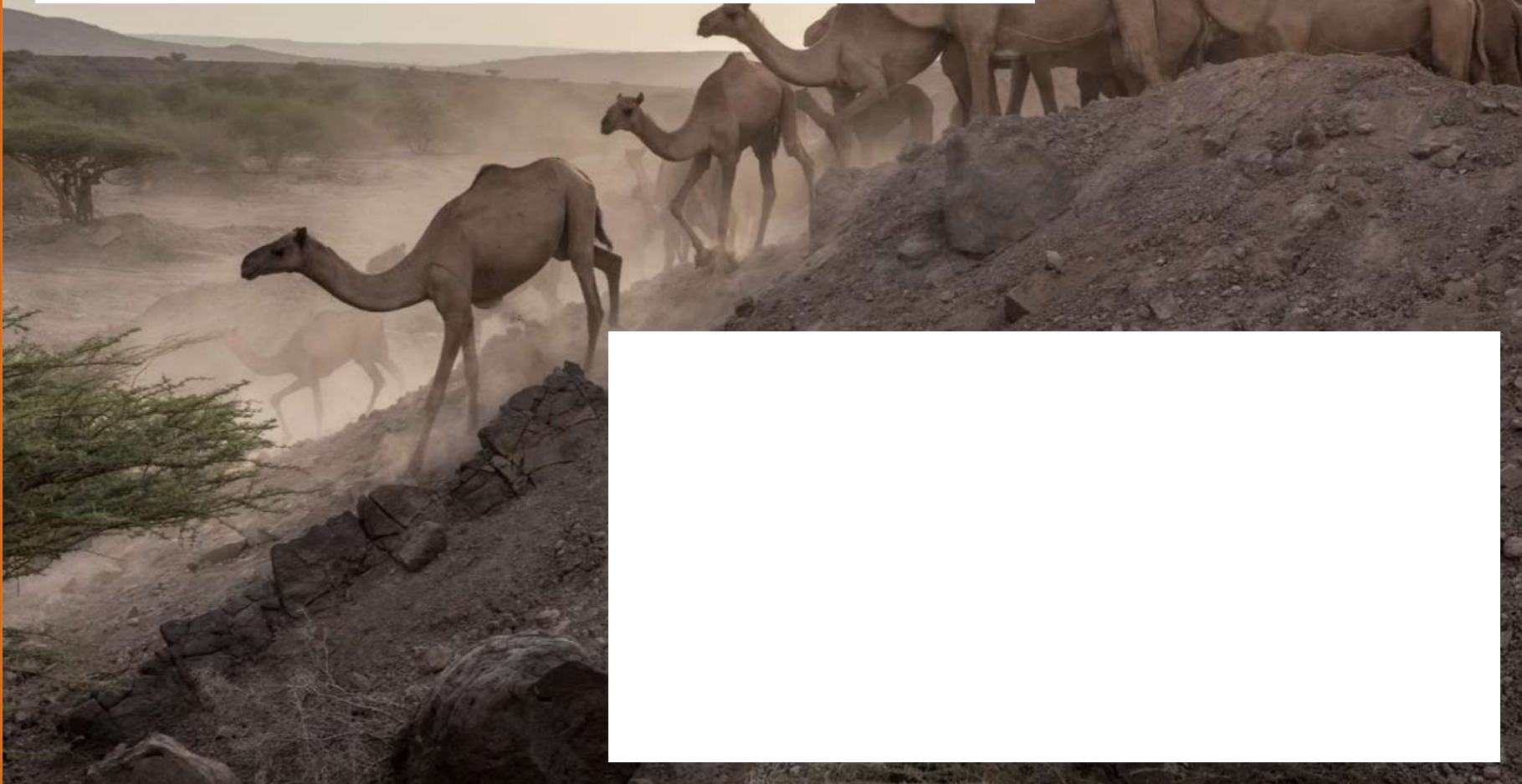
**John Butterworth, Country Director, IRC WASH
Petros Birhane, Chief of Party, USAID Lowland WASH**



USAID
FROM THE AMERICAN PEOPLE



- Major new infrastructure investments are hard to justify without improvements in maintenance
- Improvements in maintenance will depend on improvements in monitoring





Harsh climate:
frequent drought

Context

Mobile
pastoralist
communities

New roads,
railways, towns
and irrigation
schemes

Conflicts
over scarce
resources

Very little private
sector presence

Human right
to water

System



- New monitoring technologies provide an opportunity to strengthen the system
 - mobile-based data collection
 - asset inventory supported with flow rate and quality measurement
 - Sensors for near real-time updating
- Key objectives are prioritization of maintenance and asset management, and related financing
- Consistent with flagship Climate Resilient WASH initiative

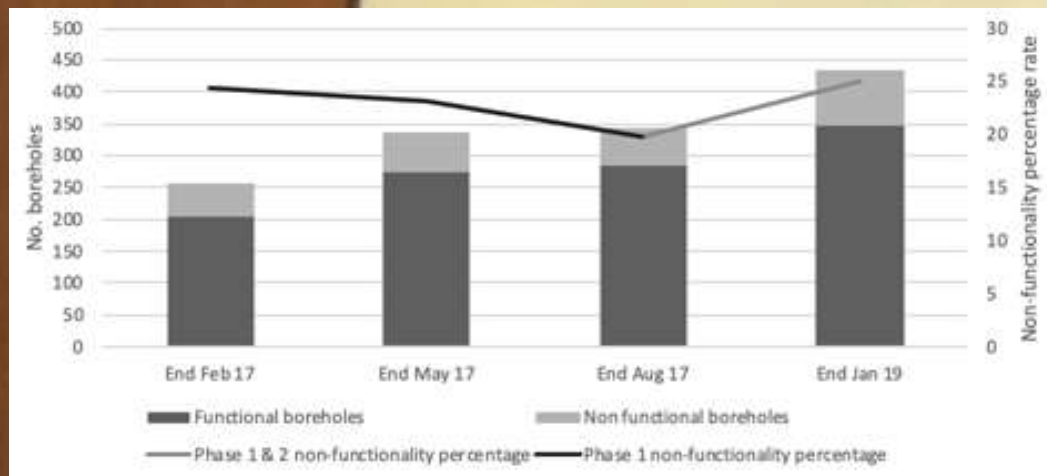


In Somali region, UNICEF supported the water bureau to develop the Somali Functionality Inventory - a response to the 2016/17 drought - now includes 424 motorized boreholes

New ways of
working



Evidence



2017:

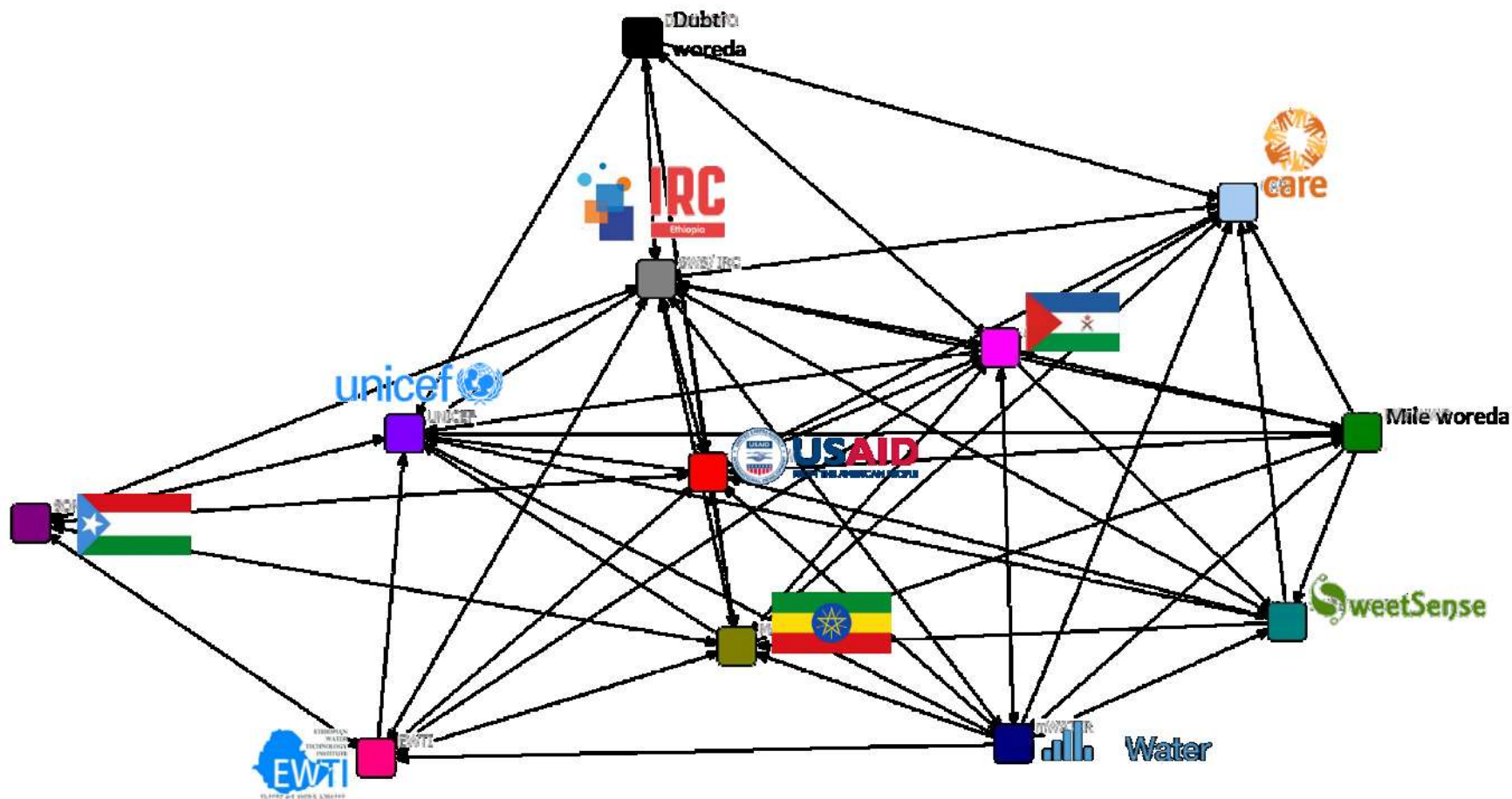
- asset inventory and updates by telephone calls and MMTs
- Non-functionality reduced by 5%

2018:

- Political changes
- New staff in woredas
- Less investment from govt/ UNICEF
- Less MMT activity
- BHs running 15-20 hrs day

USAID's Lowland WASH Activity has led a multi-stakeholder partnership focused on improving rural water asset

Asset management





Afar Regional Water Bureau Water Service Asset Management System



This management system allows Afar Regional Water Bureau and partners to manage the functionality and condition of the water system assets in the region

Functionality	Reported functionality and automatic per sensor split by zone, woreda, and system, shown as dashboard, map and table
Assets	Which type of assets are where, and what is their condition
Coverage	How many people are served and where they are
Maintenance	Which maintenance issues are outstanding and which have been resolved
Sensors	Details on the automatic Sweetsense sensors installed
Reports	Standardised reports as per requirements
Help	Provides help and support how to use the platform and the related phone app

273

Water systems

183

Asset surveys

152

Sweetsense sensors active

100

Pumps in use (according to sensor)

Background

Liveland WASH is USAID's flagship WASH activity in the livelihood areas of Ethiopia. It is a critical piece of the U.S. Government's contribution to the Government of Ethiopia's (GoE) One WASH National Program (OWNP)—a government-driven, sector-wide approach formed to address the WASH needs of rural, urban, and pastoralist communities, schools, and health pools in an integrated manner across sector ministries and institutions.

In line with the overall objectives of the OWNP, Liveland WASH accelerates access to improved, sustainable drinking water and sanitation, catalyzes enhanced hygiene behaviors, and expands sustainable water use for smallholder agriculture in the Somali, Afar, and Southern Nations, Nationalities and Peoples (SNNP) of Ethiopia. Liveland WASH has four major objectives: (1) increased access to improved drinking water supply services on a sustainable basis; (2) increased adoption of key hygiene behaviors and increased access to improved, sustainable sanitation; (3) improved efficiency and sustainability of food production from irrigated and rain fed agricultural systems; and (4) improved water resource governance and stake management.

Partners



Afar Maintenance

This dashboard shows the issues that have been reported and if they have been resolved 55% of issues are open



90

Open issues

4

Update

1

Resolve

69

Closed issues

Open

Report and notify technician

Update

Diagnose the problem

Resolve

Repairs made

Close

Verify functionality

Open

Either opened by a colleague, or by Sweetsense sensor. Not yet allocated or confirmed.

Update

It is confirmed and work has been allocated - it is in process

Resolved

Technician or responsible has visited and resolved the problem

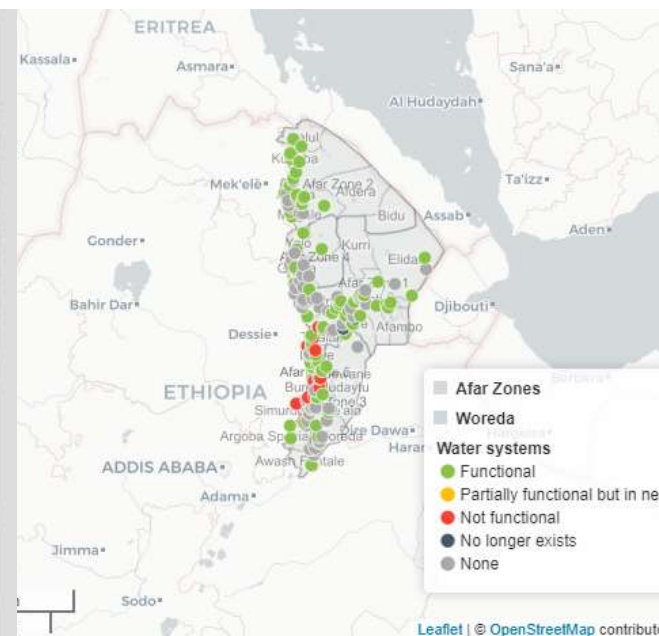
Closed

Administrator recognises that the issue has been addressed properly and closes it

Open Issues

Location name	Water system name	State	Open date	Update date	Resolution date	Problem description
		Open	Mar 4, 2019			

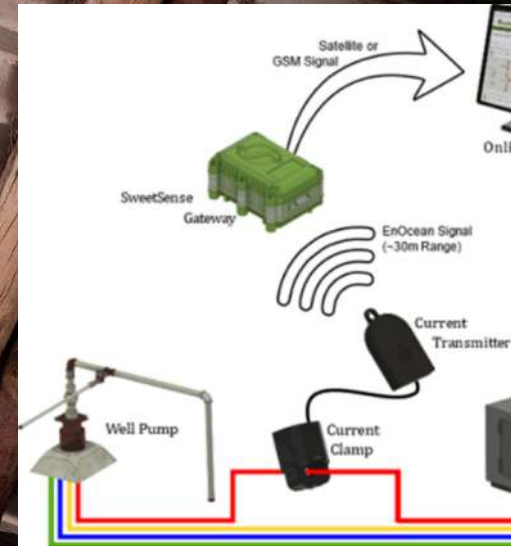
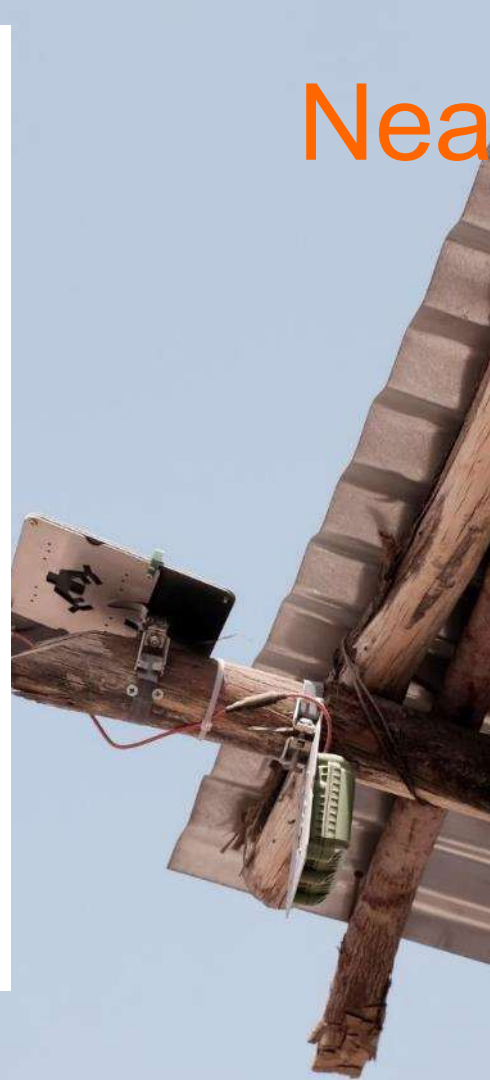
Submitted by
yedir



<https://afar.mwater.co/>

Near real-time

- Deep motorised boreholes with pumps cost approx. USD 100,000 each
- A sensor adds 1% to costs
- Measures power to pump. Enables calculation of:
 - Runtime
 - Production (based on known power to flow rate relationship)
 - Potential failure
- Data transmitted by mobile phone network or satellite
- New low-bandwidth satellite communications becoming available

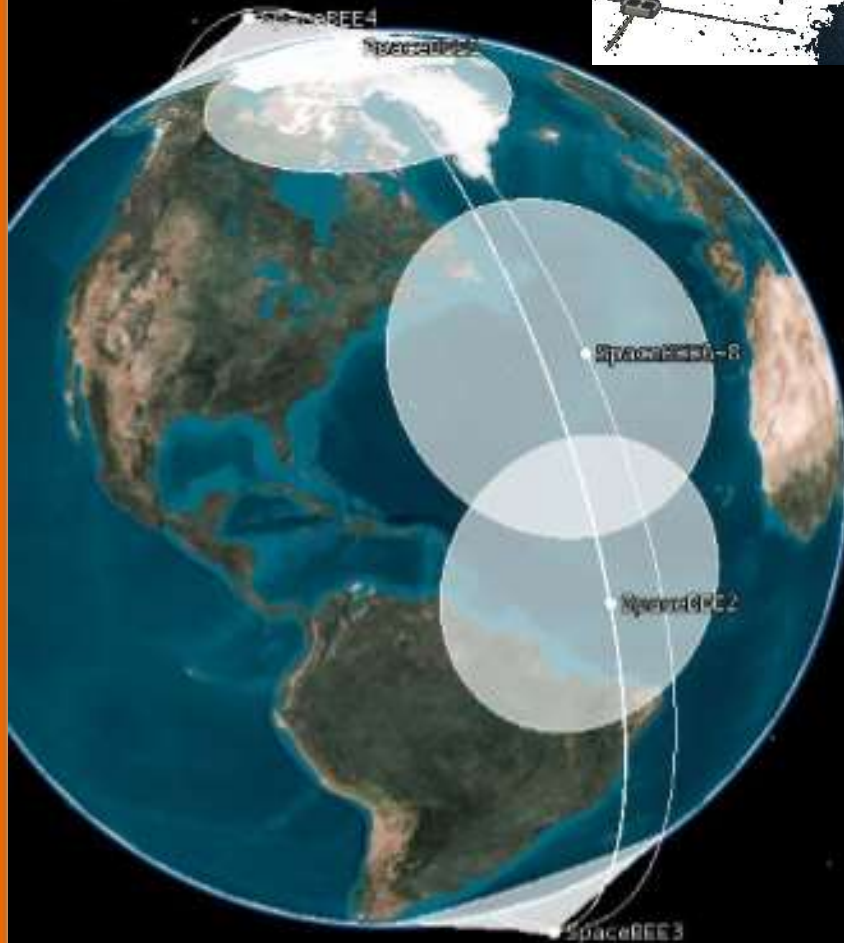


December 2018
7 satellites

SWARM

Enabling global connectivity
with the world's lowest-cost
satellite network

December 2019
150 satellites

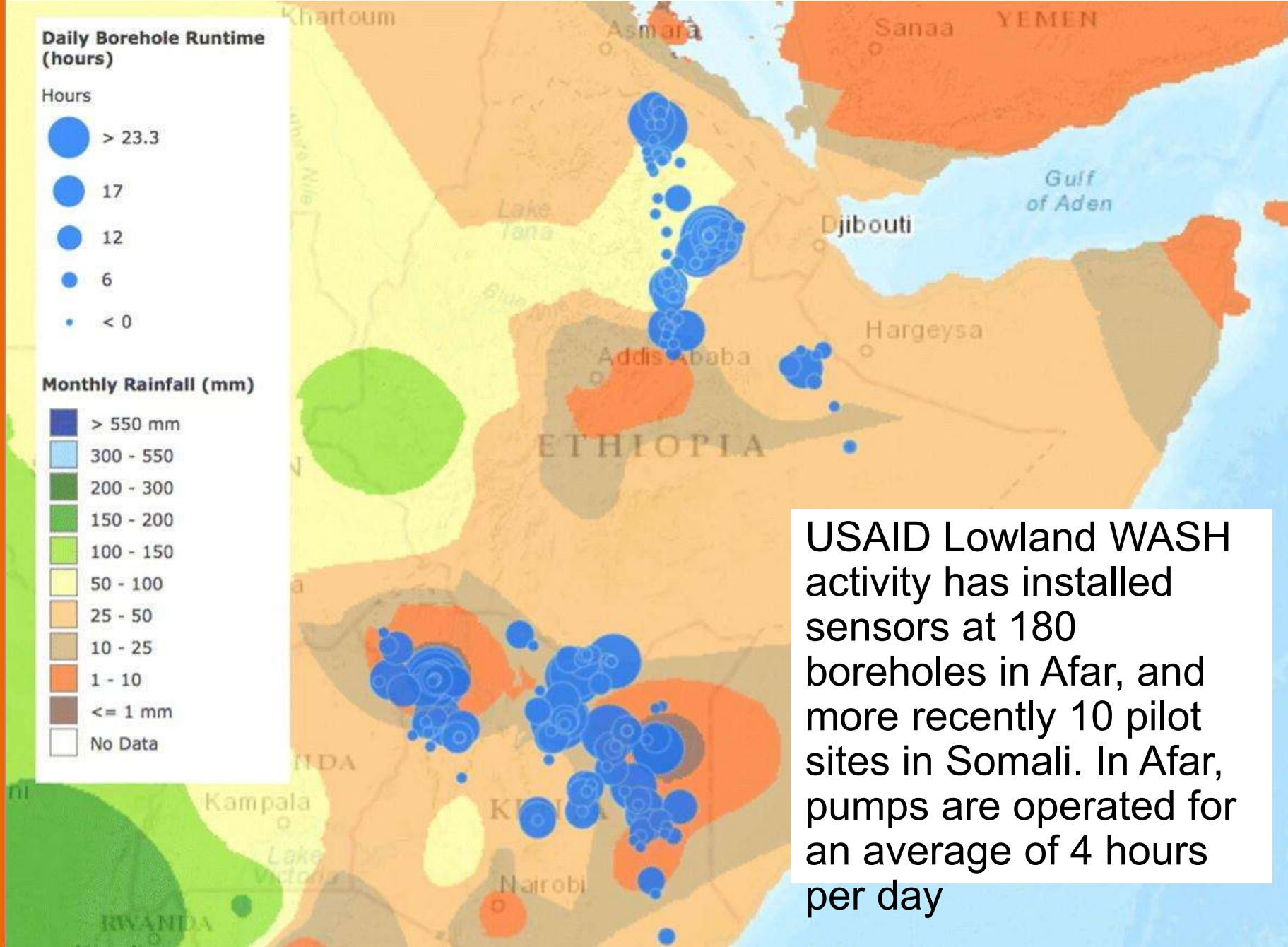


**Daily Borehole Runtime
(hours)**

Hours



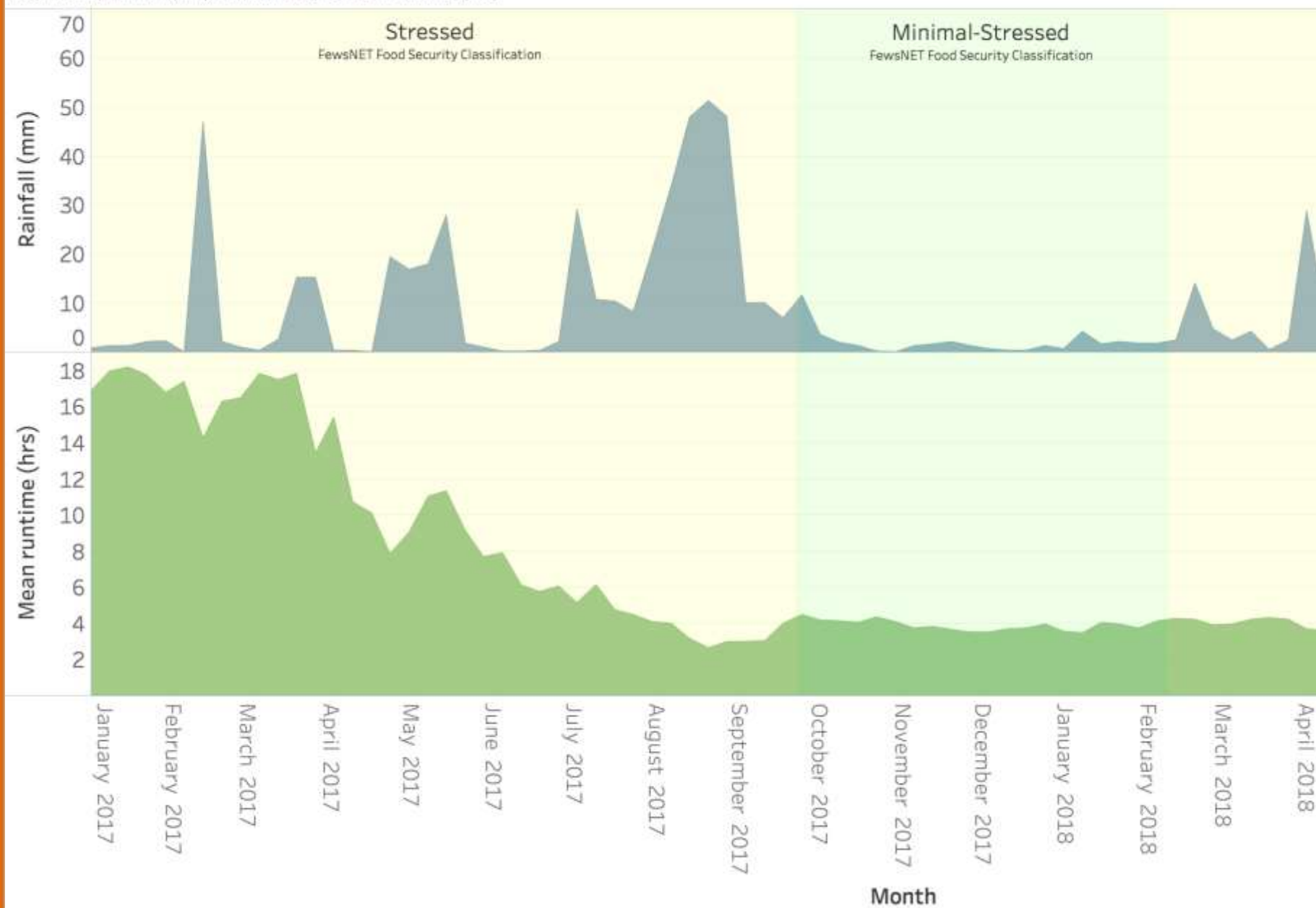
Monthly Rainfall (mm)



USAID Lowland WASH activity has installed sensors at 180 boreholes in Afar, and more recently 10 pilot sites in Somali. In Afar, pumps are operated for an average of 4 hours per day

Afar, Ethiopia

Total Weekly Rainfall (mm) vs. Mean Daily Borehole Runtime (hrs)



Impact evaluation in Afar
based on implementation
science framework

Advocacy based on data to
reduce non-functionality

Potential to roll out a
common asset management
platform in Somali region
(and elsewhere).

Next steps

Small Town Water Utilities
and new pilot public rural
water utilities as data users

In Somali, USAID
Lowland WASH and
UNICEF will install 81
further sensors on
critical boreholes

Test SWARM for
low-cost sensor
communications

In Afar, piloting use of data to
improve maintenance managed by
region (April-June)

