

WEBINAR: FROM CITIZEN SCIENCE TO GLOBAL INSIGHTS



Best practices for citizen led water
quality monitoring projects

WEBINAR GUIDELINES

Webinar

From citizen science to global insights



Mute your microphone



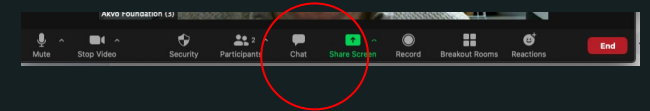
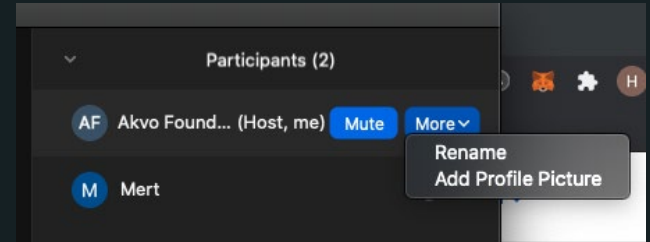
Use your headphones



Change your zoom name to
your real name



Questions? Put them in the
chat and we'll address them in
the Q&A



SPEAKERS

Webinar

From citizen science to global insights



FRANKY LI

WASH Specialist,
Akvo



DR PAUL CAMPLING

International Business
Development Manager,
Vito



**DR. SUNDERRAJAN
KRISHNAN**

Executive Director,
INREM Foundation

AGENDA

Webinar

From citizen science to global insights

01

INTRODUCTION

02

ABOUT THE PAVITRA GANGA PROJECT

03

COMMUNITY-BASED WATER QUALITY MONITORING

04

CONNECTING CITIZENS WITH DATA AND TECH

05

Q&A

INTRODUCTION

ABOUT THE PAVITRA GANGA PROJECT

UNLOCKING WASTEWATER TREATMENT, WATER REUSE AND RESOURCE RECOVERY OPPORTUNITIES FOR URBAN AND PERI-URBAN AREAS IN INDIA

DR PAUL CAMPLING – PROJECT COORDINATOR

STARTED FEBRUARY 2019, ENDS JANUARY 2024



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821051.



This project has been co-funded by Department of Biotechnology (DBT), Government of India.



PROJECT GOAL AND APPROACH

From citizen science to global insights



Unlock environmental and economic potential wastewater treatment / re-use & resource recovery (RRR)

**WASTEWATER TREATMENT &
RESOURCE RECOVERY**

WATER GOVERNANCE

SMART WATER MANAGEMENT

THE CONSORTIUM

From citizen science to global insights

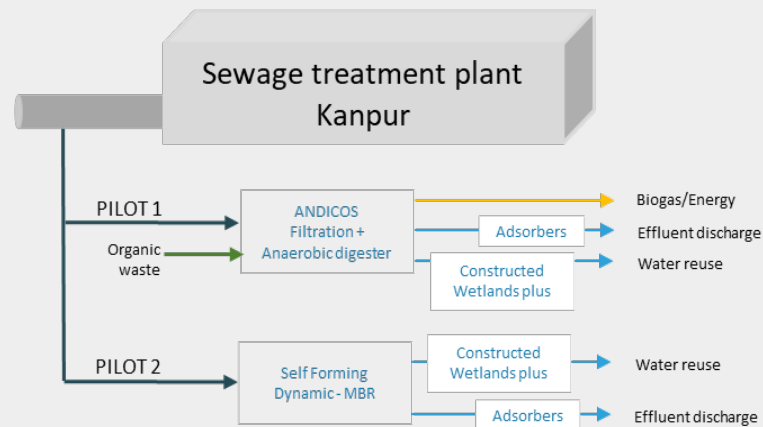
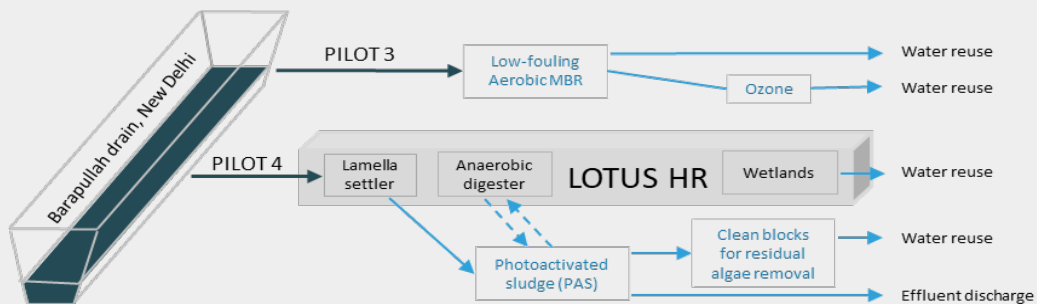
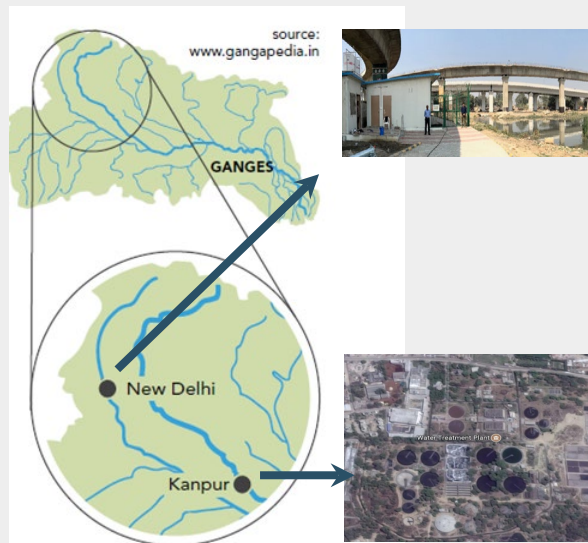
14 partners: 3 RTOs – 6 UNIs – 3 SMEs – 1

Water Utility – 1 Industry



TWO URBAN CASES IN NEW DELHI AND KANPUR

From citizen science to global insights



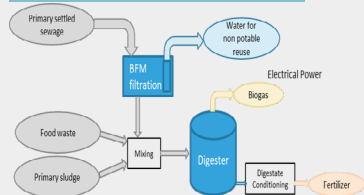
INNOVATION ACTIVITIES



TECHNOLOGIES PILOTED – WW TREATMENT (& RESOURCE RECOVERY)

From citizen science to global insights

ANDICOS



SELF FORMING DYNAMIC-MBR



STRUCTURED ADSORBENTS

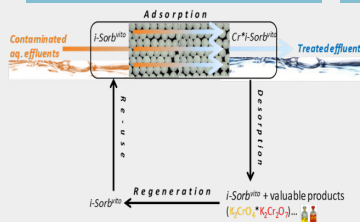
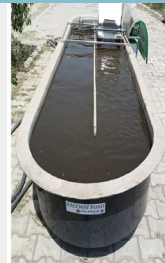


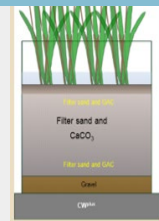
PHOTO ACTIVATED SLUDGE



CLEAN BLOCKS



CONSTRUCTED WETLANDS +



OZONATION



AEROBIC MBR

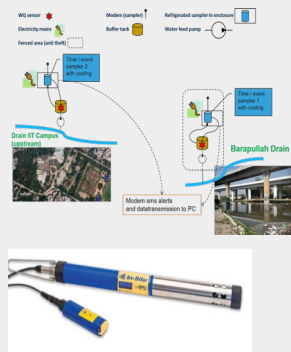


BULK ORGANICS AND NUTRIENTS REMOVAL

POLISHING OF PROBLEM COMPOUNDS

TECHNOLOGIES PILOTED – SMART WATER MANAGEMENT

From citizen science to global insights



STATIONARY SENSORS + GRAB SAMPLERS



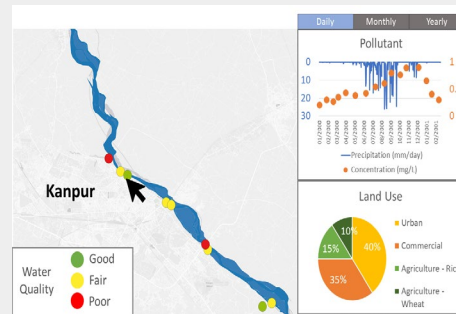
CITIZEN BASED MONITORING



AQUA-TRACK



REGIONAL WATER BALANCE SCENARIOS



DASHBOARD

MONITORING TOOLS

MODELLING TOOLS

WATER GOVERNANCE

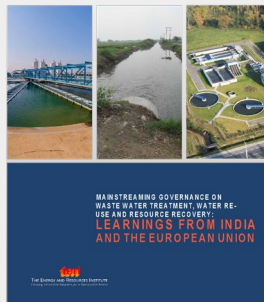
From citizen science to global insights

STAKEHOLDER ENGAGEMENT

Stakeholder Consultation Workshops



POLICY SUPPORT



WASTEWATER SAFETY PLANS



CITIZEN SCIENCE – THE GLUE BETWEEN STAKEHOLDER ENGAGEMENT AND MONITORING

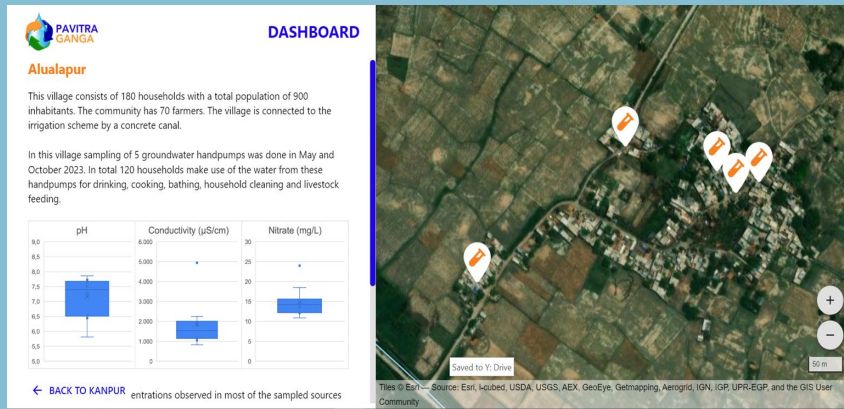
Baseline using hand-held Water Quality monitoring devices with smartphones

- flag up water quality issues and
- open up a dialogue with water users (Rural and Urban Areas)

Ambient water quality parameters (Nitrate, pH and Electrical conductivity) + E. Coli measurements

- Rapid surveys to detect hotspots
- Trigger sampling for Lab analyses
- Assess risk for water use (drinking, irrigation)

Dissemination using a Project Dashboard



WORKSHOPS AND FINAL CONFERENCE

From citizen science to global insights

WORKSHOP: WATER MANAGEMENT DECISION SUPPORT TOOLS IN INDIA

22 January 9:19 - 16:00 IST | New Delhi

FINAL CONFERENCE: WASTEWATER TREATMENT AND REUSE: CHALLENGES AND SOLUTIONS IN INDIA

24 January | 9:00 - 18:00 IST

[Link](#)

COMMUNITY BASED WQ MONITORING SYSTEM



COMMUNITY BASED WATER QUALITY MONITORING

Experiences from designing and implementing community based water quality monitoring programs across India.

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Webinar

From citizen science to global insights

THE PROBLEM

Why it is important to focus on Water Quality

THE PROCESS

Designing & implementing Community Based Water Quality Monitoring System

EXPERIENCES

Learnings from different initiatives across India

CONCLUSION

Design elements for community based water quality monitoring

THE PROBLEM



THE PROBLEM

From citizen science to global insights

150 MILLION

People affected with water related diseases

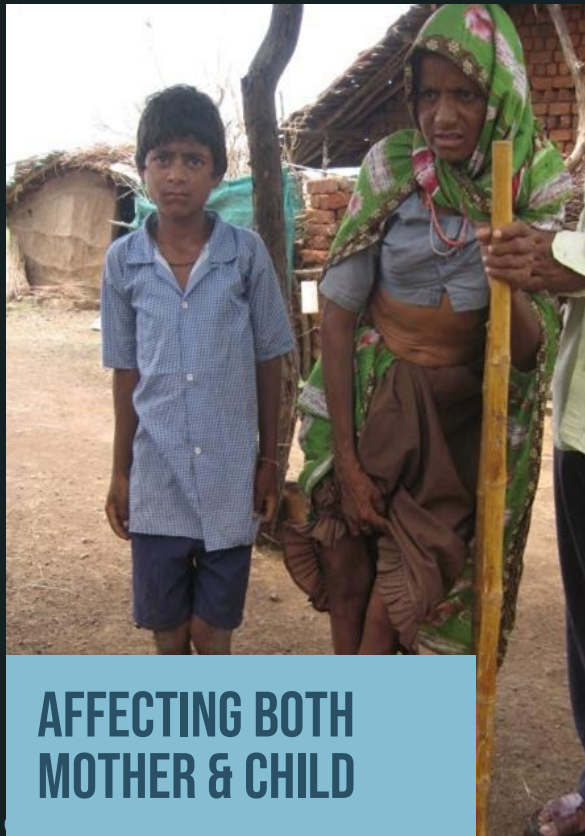
6.7-8.7 BILLION USD

Economic cost of problem from health, agriculture and industry
from water contamination*

THE PROBLEM

Webinar

From citizen science to global insights



**AFFECTING BOTH
MOTHER & CHILD**



SKIN LESIONS



**STAINING OF TEETH &
DEFORMITY OF LIMBS**

THE PROCESS



IT TAKES A PROCESS

From citizen science to global insights

- 1 Identify your champion - it can be a community service provider or citizen
- 2 Build their capacity - on problem & solution through physical or virtual interactions
- 3 Demonstrate solutions - along with the community service provider or citizen.
- 4 Integration for sustainability - within government or non-government programs.
- 5 Collaborate - to share and learn insights from ground.

EXPERIENCES



IDENTIFY YOUR CHAMPION

Identify which community service provider or citizen group closely aligns with your goals.

Understand their roles and functions.

Design and implement their participation to add value to existing efforts.



IDENTIFY YOUR CHAMPION

From citizen science to global insights



**JALAGARA/
WATERMEN**



ASHA



**VWSC/
CRP/CITIZENS**



BUILD THEIR CAPACITY

Jalagara/Watermen are community service provider managing the water supply in the village.

Flipcharts & Demonstrations were used to build their capacity on water testing.

In 2020-21, 290 members were trained.

DEMONSTRATE SOLUTION

Have clear action points after training.

Give them clear instructions - testing water quality - what, how, where

Support them in this process. Learn and iterate to overcome ground challenges.



EXPERIENCES FROM CHIKKABALLAPUR

From citizen science to global insights

JALAGARA AND CRP TRAINED TO DO CONDUCT WATER TESTING

About 290 members and 45 CRPs from Partner Organisation were trained to test water in their villages.

DOCUMENTING RESULTS IN DIGITAL PLATFORM

The testing results were uploaded through a digital tool.

USING THE INFORMATION IN VILLAGE DEVELOPMENT PLANS

The Partner Organisation is now using the information in the village plans keeping the focus on Water Quality.

INTEGRATION FOR SUSTAINABILITY



Monitoring Systems demonstrated need to be integrated within existing efforts.

This helps in sustainability.

This could be within government or non-governmental programs

EXPERIENCES FROM NALGONDA

From citizen science to global insights

ANGANWADI MEMBERS TRAINED TO DO CONDUCT WATER TESTING

About 200 members were trained to test water at their centres across one block of Nalgonda district.

TESTING KITS FROM RURAL WATER SUPPLY

INREM team shared the rationale to the Rural Water Supply Department. Field testing kits were provided to Anganwadi supervisors who were trained.

COMPLEMENTING MONITORING EFFORTS

The activities were integrated with the goal of community led water quality surveillance program of the government.

COLLABORATE TO SHARE AND LEARN

The problem exists in many other geographies.

Sharing what you learned and learning from others will help in refining the process.

Look out for similar visions to collaborate.

EXPERIENCES FROM MADHYA PRADESH

From citizen science to global insights

WOMEN LED GROUPS

198 women were trained to do water testing in 30 villages across 5 districts of Madhya Pradesh by WaterAid.

DOCUMENTING AND DISPLAYING THE RESULTS

Women were trained to identify sources, test, document, display the results to the community.

INTEGRATING WITH PRI AND DISTRICT EFFORTS

The activities were integrated with community led water quality surveillance program of the government.

CONCLUSION



COMMUNITY BASED WATER QUALITY MONITORING SYSTEM

From citizen science to global insights

1

Identify your champion - it can be a community service provider or citizen

2

Build their capacity - on problem & solution through physical or virtual interactions

3

Demonstrate solutions - along with the community service provider or citizen.

4

Integration for sustainability - within government or non-government programs.

5

Collaborate - Distribute the ability to solve the problem by sharing or learning with more partners.

CONNECTING CITIZENS WITH DATA AND TECH

ABOUT AKVO

From citizen science to global insights

Akvo helps to turn data into actionable insights in a **sustainable and contextualised** manner to improve impact.



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From citizen science to global insights

01. CITIZENS SEEING THE TRUTH

**02. RAISING THE VOICE OF
CITIZENS**

**03. MOBILIZING CITIZENS FOR
TECH SOLUTIONS**

01. CITIZENS SEEING THE TRUTH

WQ Impact of Artisanal Gold
Mining in Guyana





THE CHALLENGES

WQ testing requires technical training

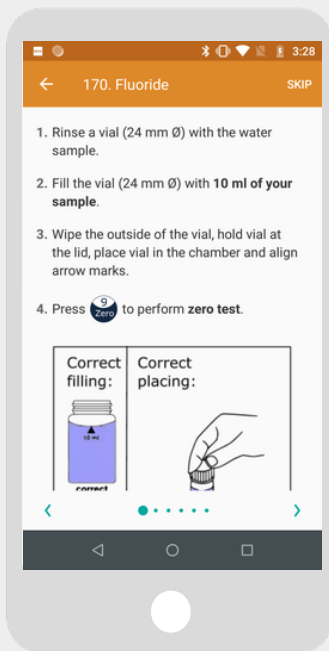
WQ results are hard to understand

DATA AND TECH SOLUTIONS - THE TOOL



DATA AND TECH SOLUTIONS - UX CUSTOMIZED FOR CITIZENS

From citizen science to global insights

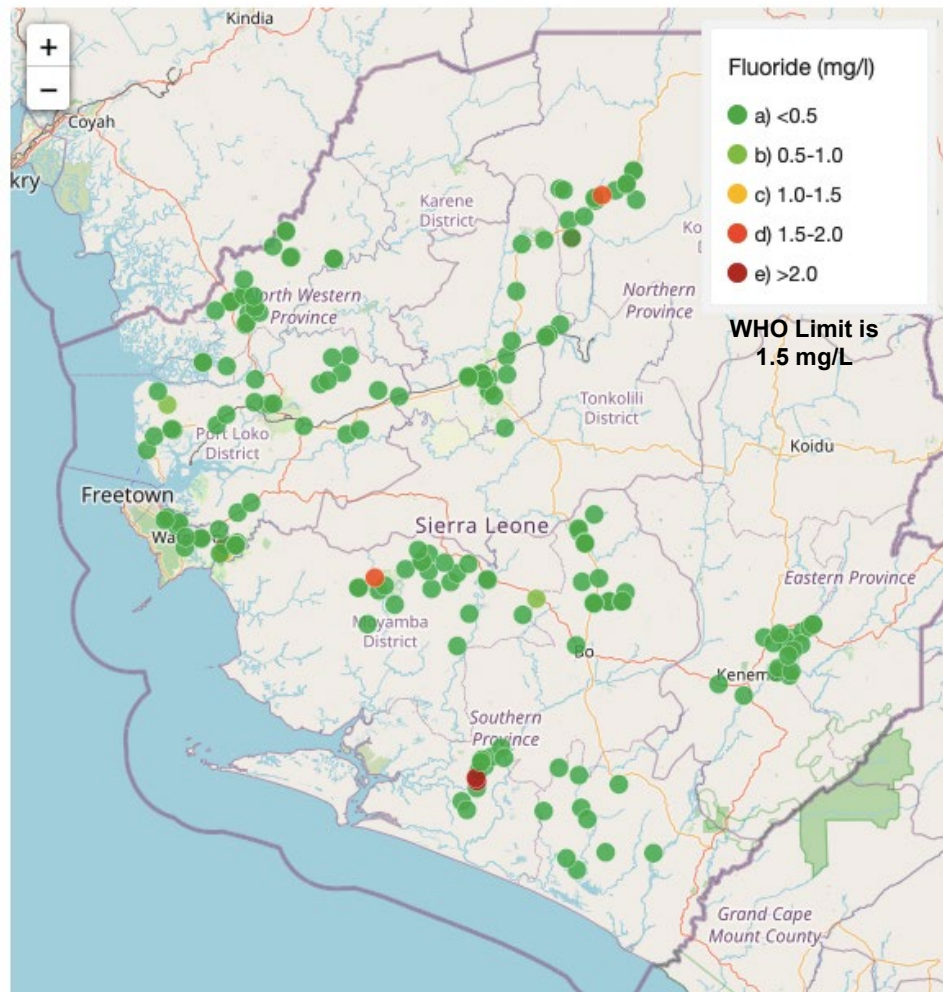


Health Risk (E. coli) HH drinking water per district

Data last updated: 14th Jan 2019 - 11:33



Data last updated: 4th Mar 2019 - 13:30



02. RAISING THE VOICE OF CITIZENS



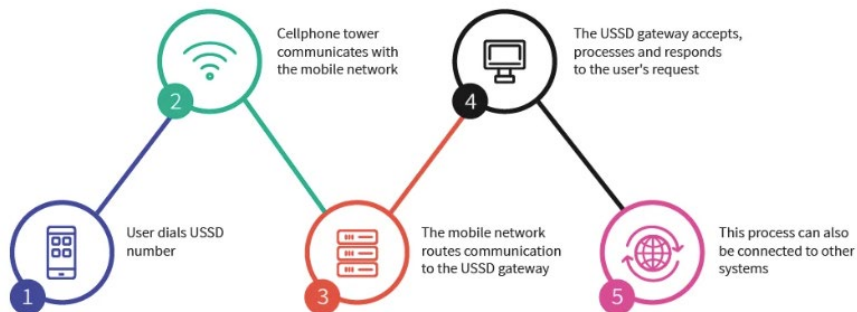
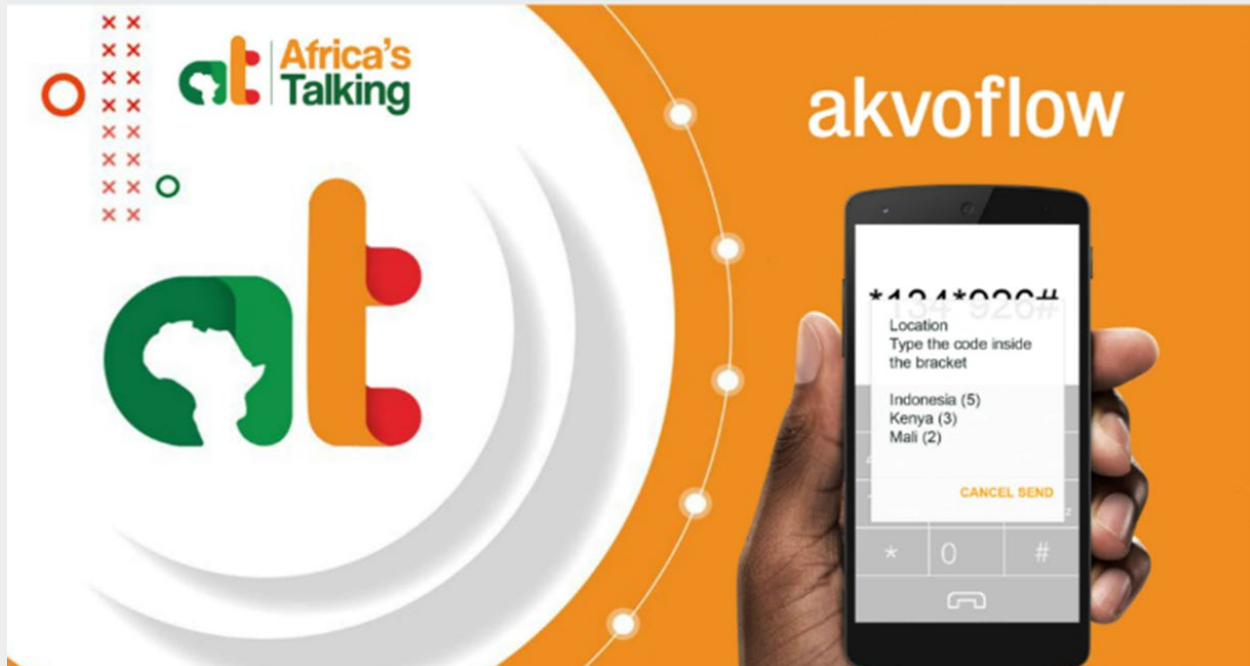
THE CHALLENGES

Citizens lack feedback pathways

Citizens are too busy to answer questions



DATA AND TECH SOLUTIONS - CROWDSOURCING



IMPACT OF COVID-19 ON FOOD SECURITY IN ZAMBIA

From citizen science to global insights

53%

of the respondents reported that their work was affected by COVID-19

65%

of the respondents had witnessed malnutrition

9/10

respondents mentioned that food prices increased

40%

of respondents mentioned that the food prices went up from 50% to 100%

72%

of respondents mentioned a decline in supply of food in markets

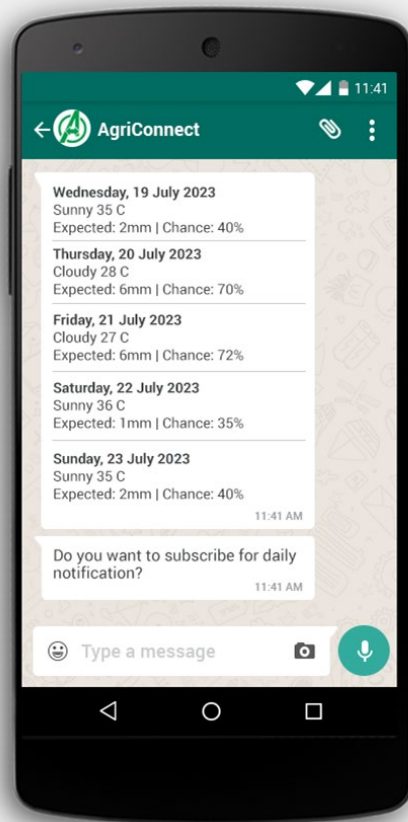
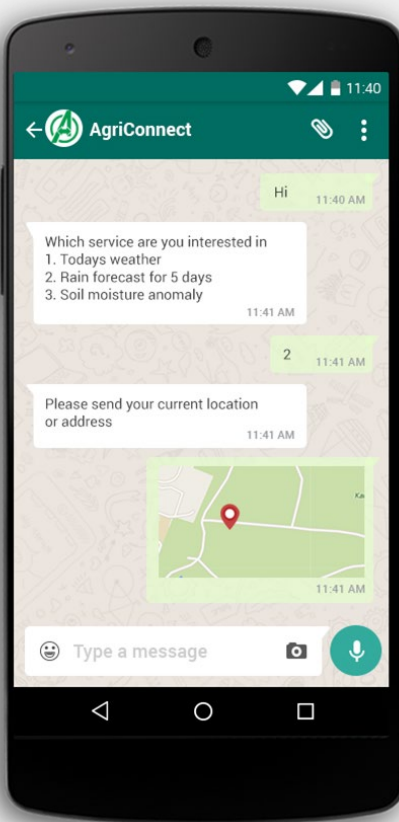
75%

of respondents said that their eating habits had changed

DATA AND TECH SOLUTIONS - TWO-WAY COMMUNICATION

Webinar

From citizen science to global insights

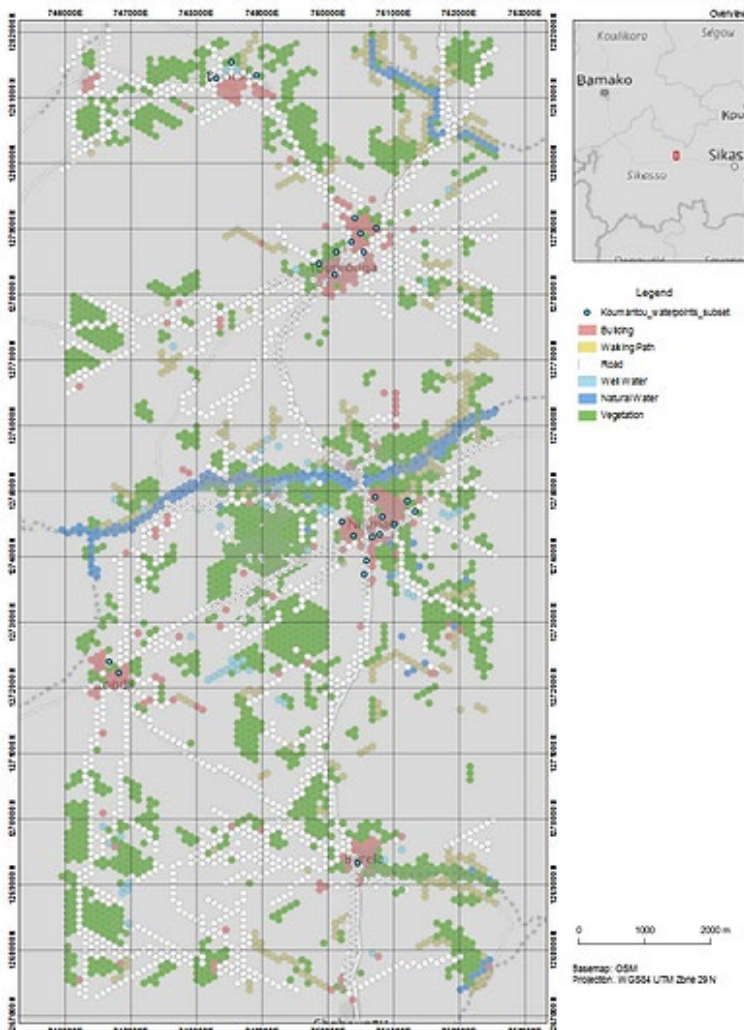


DATA AND TECH SOLUTIONS - GAMIFICATION

CERBERUS

Solving world problems with the
power of the crowd





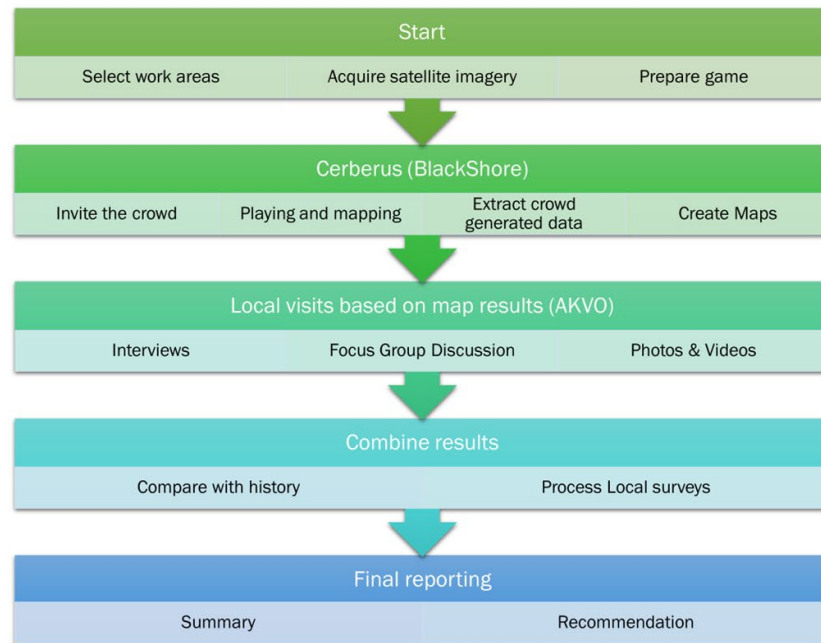
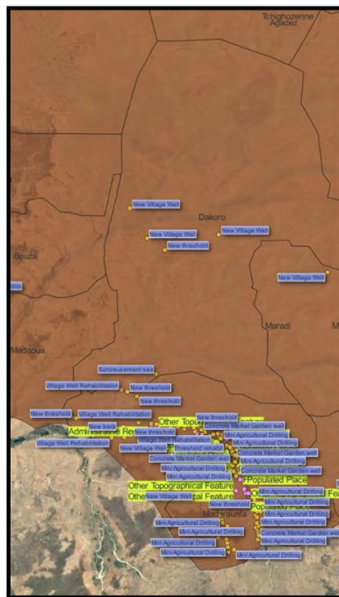
THE CHALLENGES

Lack of accurate maps for disaster response, land use planning for smallholder farmers, water resource planning, etc..

03.MOBILIZING CITIZENS FOR SOLUTIONS

Gamification of GIS Work

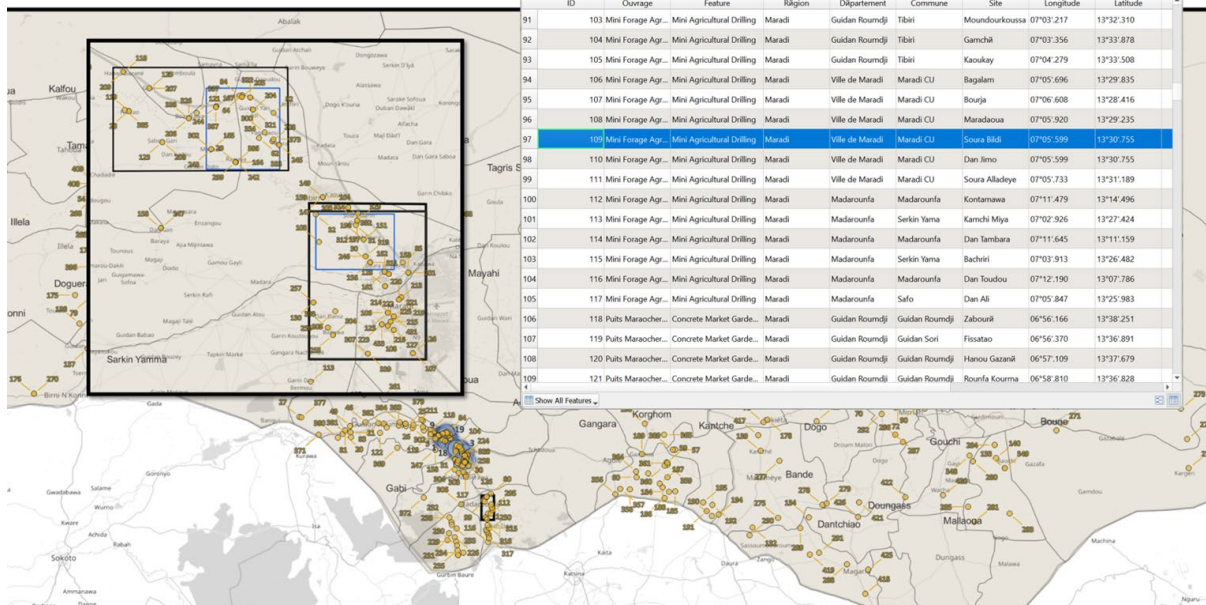
The approach



03.MOBILIZING CITIZENS FOR SOLUTIONS

Gamification of GIS Work

Selecting work areas



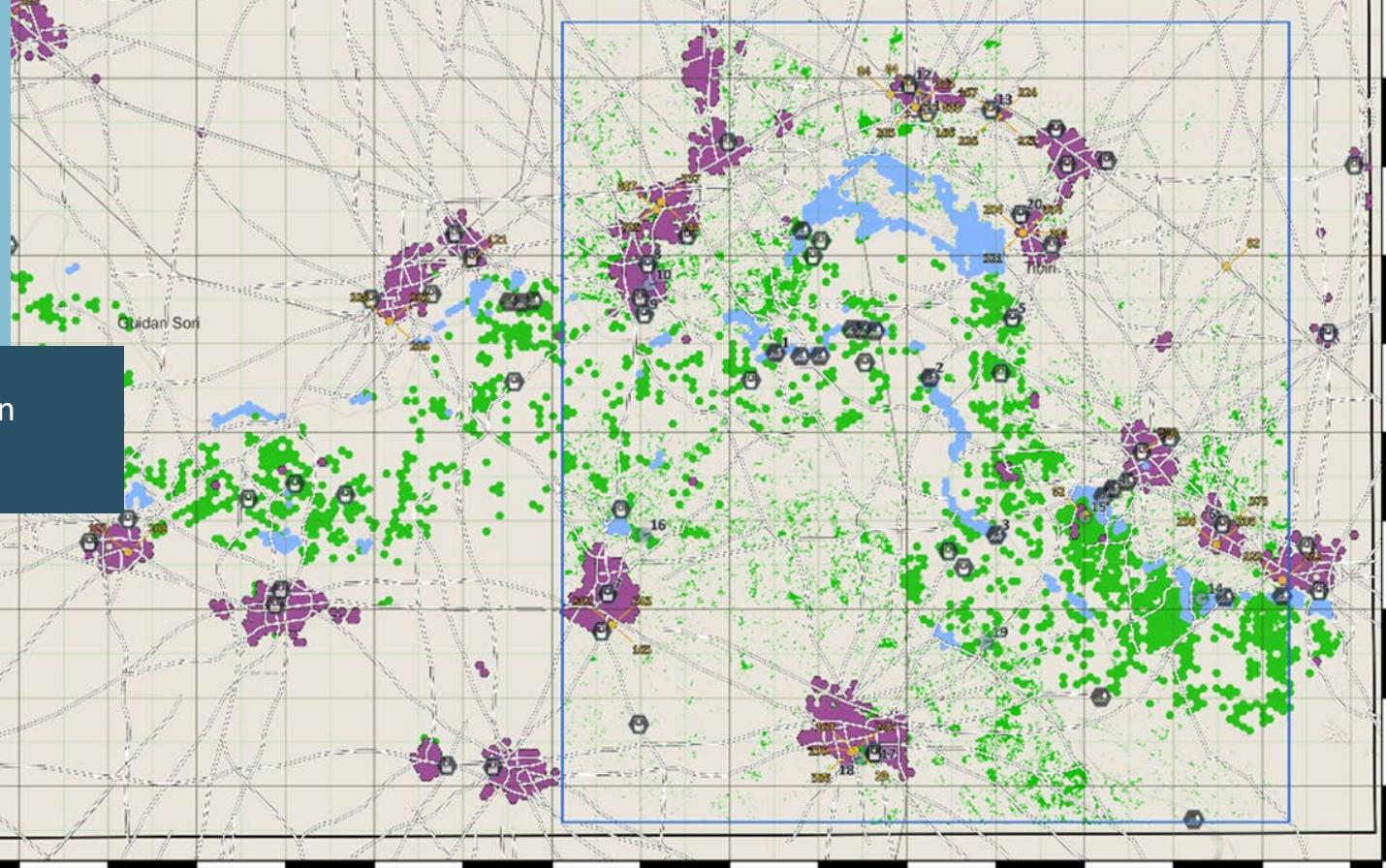
03.MOBILIZING CITIZENS FOR SOLUTIONS

Gamification of GIS Work



03.MOBILIZING CITIZENS FOR SOLUTIONS

Agriculture and Urban
Places Mapped



Legend Maradi North (rural)

- Estimated PMERSA locations with ID [417]
- Mapped area with Cerberus (93km²)
- Area historically compared (pre PMERSA) (27km²)
- Historically compared locations with ID (selection visited by AKVO)
- Mapped wells (n=73)
- Mapped dams and other water related improvements (n=23)
- Mapped rural roads (509km)
- Mapped vivid agriculture and healthy vegetation (7,04km²)
- Mapped towns and buildings (3,73km²)

■ Mapped fresh surface water (2,51km²)
Background: OSM

Akvo.

BlackShore



DIGITAL AND DATA TOOLS...

From citizen science to global insights

HELP CITIZENS TO COLLECT AND
UNDERSTAND GOOD QUALITY
DATA

PROVIDE A FORUM FOR CITIZENS
TO BE HEARD

PROVIDE A PLATFORM FOR
CITIZENS TO PRODUCE
INFORMATION PRODUCTS

Q&A

DO YOU HAVE ANY QUESTIONS?

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