Rock – Eco Innovation

Mobile application + USSD service for cage fish farmers, Lake Victoria

Know before the water turns

1. Problem

- Climate swings, algal bloom and low oxygen cause fish deaths
- Satellite and sensor data exist but are scattered and never become advice
- Farmers and traders lack timely prices and storage information

2. Solution

- Fuses satellite, IoT sensor and weather data in a decision engine
- Scores risk and sends simple Swahili alerts and advice
- One flow linking farmers, traders and extension officers

3. Two ways to reach users

Mobile app: dashboard, risk map, market and harvest tools for smartphone users and traders.

USSD service: works on any phone, no internet needed. Dial the short code for water status, advice, prices and harvest registration.

Alerts also go out by SMS in Swahili.

Satellite lake-wide › **IoT sensors** cages, storage › **Weather** rain, wind, heat › **Decision engine** risk score › **Alert + advice** App · USSD · SMS › **Outcome** fewer losses, better prices

Why USSD matters

- Reaches farmers without smartphones or data
- Free of app install; works on weak networks
- Pay and register via mobile money

Gap we fill

- Others: cage-level sensing or a marketplace
- None link whole-lake satellite, cage data and market in one farmer flow

Income

- Farmer subscription via mobile money
- Sensor-as-a-service (unit ≈ $230–280)
- Market linkage fees; partner funding

Marketing

- Demo days at cage sites
- Extension officers, radio, WhatsApp groups
- Free pilot, then pay-as-you-go

Ask: mentorship and incubation to pilot on 2–3 cage farms (Oct–Dec). Pipeline already runs end to end on mock data.

Maji Sasa

SMART IRRIGATION. BETTER HARVESTS.

Know when to irrigate, how much water to use, and when rain is enough.

REAL-TIME FARM INSIGHTS

SATELLITE + RAINFALL DATA

SMART WATERING ADVICE



For Lake Victoria smallholder farmers

Explore Maji Sasa

www.chakalaboti.com/majisasa/

Maji Sasa

SMART WATER. STRONGER FARMS.



ABOUT US

Maji Sasa is a smart irrigation advisory platform helping Lake Victoria smallholder farmers make confident, data-driven watering decisions.

WHAT WE DO

We combine satellite observations, local rainfall data and crop water-balance modelling to tell farmers when to irrigate, how much water to use and when rain is enough.

OUR MISSION

To help farmers save water, reduce pumping costs and grow healthier crops through timely, practical irrigation advice.

OUR VISION

A future where every smallholder farmer can access reliable climate and farm intelligence for resilient, sustainable agriculture.

OUR TEAM

Group Members

Newton Deus
Leticia Charles
David Calword
Andrew Irunde
Glory Pascal

SMART WATER. STRONGER FARMS.

www.chakalaboti.com/majisasa/

KIJANISPACE TALENT PROGRAMME

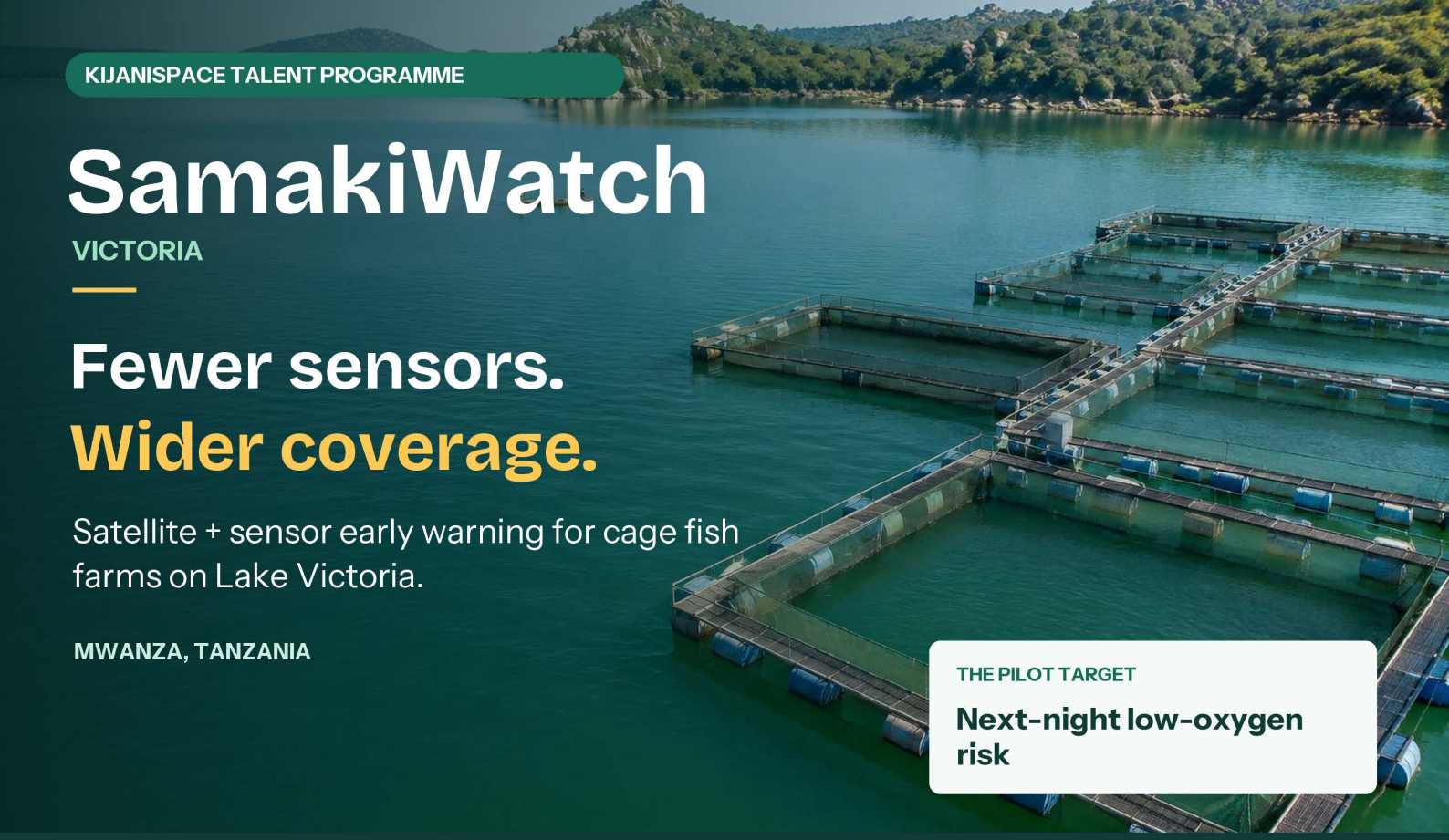
SamakiWatch

VICTORIA

Fewer sensors. Wider coverage.

Satellite + sensor early warning for cage fish farms on Lake Victoria.

MWANZA, TANZANIA



THE PILOT TARGET

Next-night low-oxygen risk

A harvest can be lost overnight.

Low oxygen, algal blooms, pollution and water hyacinth threaten cage farms.

HOW THE IDEA WORKS

Local readings. Lake-wide intelligence.

01

Sensors teach

Water sensors measure oxygen, temperature, pH and turbidity to ground the model in local conditions.

02

Satellites scale

Sentinel-1/2/3 data is matched to readings. A trained model estimates risk by zone; a few sensors stay to calibrate.

03

Farmers get alerts

Only farms in affected zones receive Swahili SMS alerts, so warnings stay relevant to their location.

LESS INFRASTRUCTURE. MORE OF THE LAKE COVERED.

The pilot will test whether useful warnings can be maintained as sensor numbers fall. Accuracy and false alarms will be checked before scaling.

HELP BRING THE PILOT TO LIFE

Seeking pilot partners

A fish-farming cooperative · Sensor and satellite data access · Pilot sensors and mentorship

Concept imagery

GROUP 4 | SATELLITE + IoT BOX | LAKE VICTORIA BASIN

AgroMavuno

Protect crops. Protect the lake.
Sell at the best place, in a reliable market.

THE PROBLEM

1. **Pests are found late.** Whole fields get sprayed, so costs rise.
2. **The lake pays the price.** Rain carries pesticides into ponds and the lake.
3. **Prices are a guess.** Farmers harvest and sell without market information.

THE SOLUTION: FROM SPACE AND SENSORS TO SMS

Satellite (Sentinel)
Crop stress, rain, water

IoT Box
Farm and pond sensors

Market data
Prices and demand

↓

AI analysis: crop risk, rain warning, harvest and price outlook

↓

SMS / WhatsApp: short alerts, no smartphone needed

↓

Farmer
"Spray Zones A and B only."
"Rain coming: do not spray."

Customer (buyer)
"Maize ready in about 2 weeks."
"Expected volume and pickup date."

THE BUSINESS: HOW WE EARN

Revenue streams

Per-acre monitoring fee

Subscription: pond + selling advice

Commission from buyers

Environmental funding

Customers

Farmers, fish-pond owners, cooperatives and buyers. Later: banks and insurers.

Launch

Maize near one river; pilot with 20 to 30 farms via cooperatives.

SUSTAINABILITY: WHY IT LASTS

Economic: income repeats every season.

Environmental: less pesticide reaching the lake.

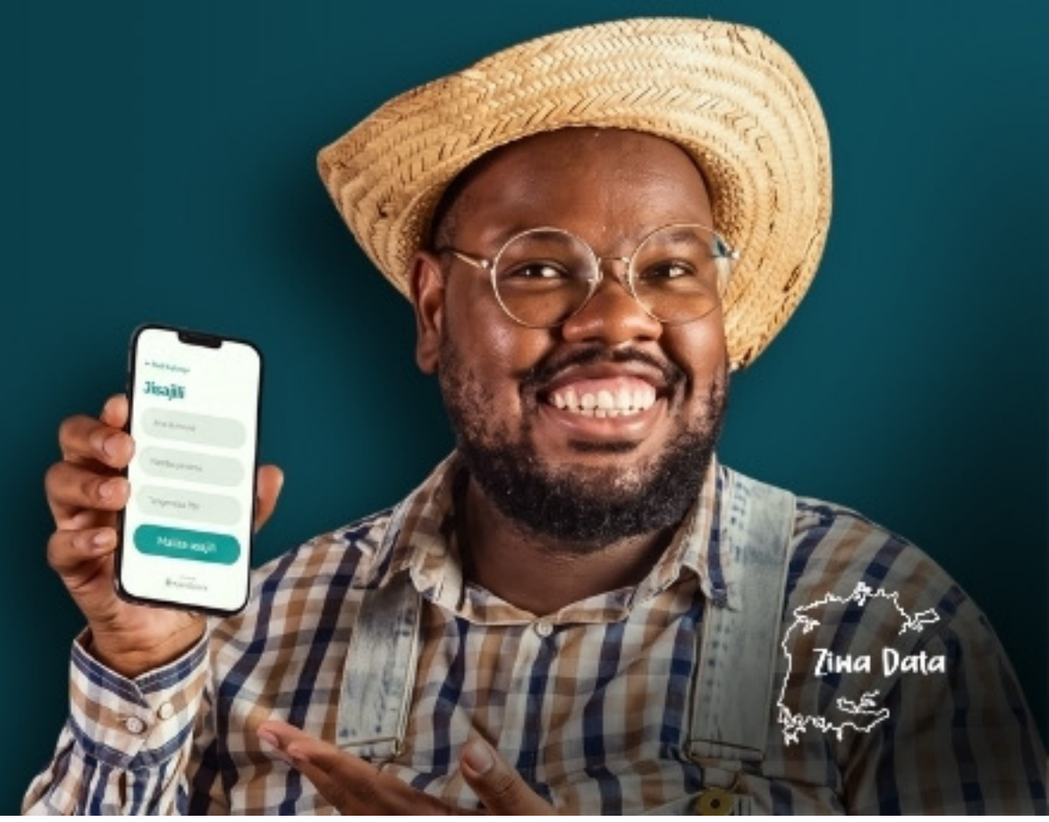
Social: SMS works without smartphones.

Operational: shared IoT Box, local technicians.

Powered by Space-IoT Box and Copernicus Sentinel data

Get all the lake data with an sms

no internet needed



Satelite Water Tracking

Copernicus Sentinel-3 data tracks surface temperature, thermal fronts, and algae blooms daily across the Mwanza Gulf.



In-Cage IoT Sensors

Real-time monitoring of dissolved oxygen (DO), pH, and water temperature directly inside the fish cages.



Simple SMS & voice alerts

Automated Swahili warnings sent to any basic phone: "Oksijeni iko chini, acha kulisha sasa!" via SMS



WHY TIMING MATTERS?



Overdue or Reacting when it's Too Late

Discovering dead fish in the morning means 100% loss of stock from an overnight Kiferezi upwelling.



Fixed Feeding & O_2 Blindness

Feeding during low-oxygen periods wastes expensive feed and suffocates aquatic life.

Zero-Fish Loss, Early warnings

protecting fish stock before overnight mortality strikes and loose it all.

Verified lender Records

turning farm data into secure credit profiles for microfinance banks.

www.ziwadata.co.tz

Download on the App Store | GET IT ON Google Play

Disclamer: This is a Demo Project from the Kijani space IoT talent trainning programme
not yet developed but coming soon to Mwanza cage Farmers & Fishing ecosystem for testing & launching

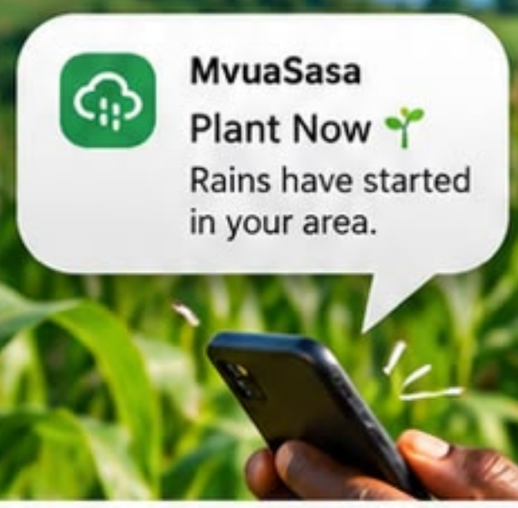


KIJANISPACE TALENT PROGRAMME

MvuaSasa

Rain Now - Plant at the Right Time

Satellite + ground sensors tell Mwanza farmers exactly when the rains have begun



Satellite Rainfall Tracking

Copernicus ERA5-Land data checked daily for your field.



Ground Sensor Confirmation

Soil moisture sensors confirm it's safe to plant, no false starts.



Simple SMS Alert

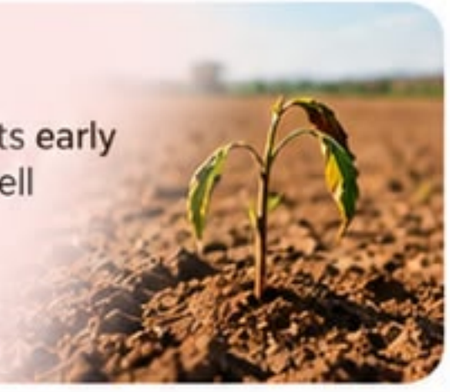
"Plant Now" sent to any basic phone, no internet needed.



WHY TIMING MATTERS

Plant Too Early

A short burst of rain tempts **early planting – then the dry** spell returns and kills young, **shallow-rooted** seedlings before they can establish.



Plant Too Late

Waiting too long out of caution **means too little rain remains** for **the crop to fully mature,** shrinking the harvest at season's end.



7-10% yield gain from optimal-timed planting

20% gain for farmers who had been planting late

Based on regional planting-time decision-support studies (One Acre Fund / TAMSAT-ALERT pilot)

Coming soon to Mwanza farmers

A KijaniSpace Talent Programme project - Mwanza, Tanzania

#KijaniSpace #ClimateSmartAg #MwanzaTanzania #RainNow

KIJANISPACE TALENT PROGRAMME HACKATHON · MWANZA

NetiSmart

Smart Screenhouse Management for the Lake Victoria Basin

A screenhouse that sees trouble coming and acts first.

Farmers growing tomatoes, cucumbers and peppers still inspect by eye and guess when to irrigate. NetiSmart combines in-screenhouse sensors with weather risk from Copernicus, then decides and acts, even when the internet drops.

1	2	3	4	5
Sense	**Predict**	**Decide**	**Act**	**Notify**
Temperature, humidity, soil, tank	Rain and heat risk from Copernicus	Local rules, works offline	Irrigation and ventilation	Kiswahili SMS

FARMERS DO NOT NEED TO READ DATA. THEY SEE A COLOUR.

GREEN	AMBER	RED
All good	Check today	Act now

NetiSmart AMBER: Heavy rain expected. Do not irrigate now. Check drainage.

The farmer stays in control: send MAJI (water) to irrigate or SIMAMA (stop) to halt.

90-DAY PILOT TARGETS (NOT PROVEN RESULTS)

20–35%	2–5	15–25%	10–20%	95%+
less water per kg sold	extra days of warning	less unsellable fruit	more marketable harvest	system uptime

Prototype. Sensor, Copernicus, SMS and valve data are simulated (DEMO). Real integrations come after the hackathon.

GROUP NO. 7