THE EARTH INSTITUTE
COLUMBIA UNIVERSITY

# Integrated Development Approach for Poverty Reduction in the Sahel

- Millennium Villages Project
- East African Drylands Alliance
- Nigeria MDG Scale Up Initiative
- Community Health Worker Scale Up
- Off-Grid Infrastructure: Shared Solar

A presentation by Jeffrey D. Sachs
Director, Earth Institute
Special Advisor to the UN Secretary General Ban Ki-moon

# Millennium Villages Project

**FIVE CORE INTERVENTIONS:**

- **Food production: Agricultural inputs**
- **Access to primary education (school meals, IT)**
- **Access to health care**
- **Access to infrastructure: roads, electricity, telephony and ICTs, safe water and sanitation, irrigation**
- **Business development**

**Built on community-led development and local professional management**

http://millenniumvillages.org/

# TARGET SECTORS AND EXAMPLES OF INTERVENTION STRATEGIES

## AGRICULTURE

- Fertilizer
- High-yield seeds
- Treadle pumps and supplemental irrigation
- Agricultural extension

## EDUCATION

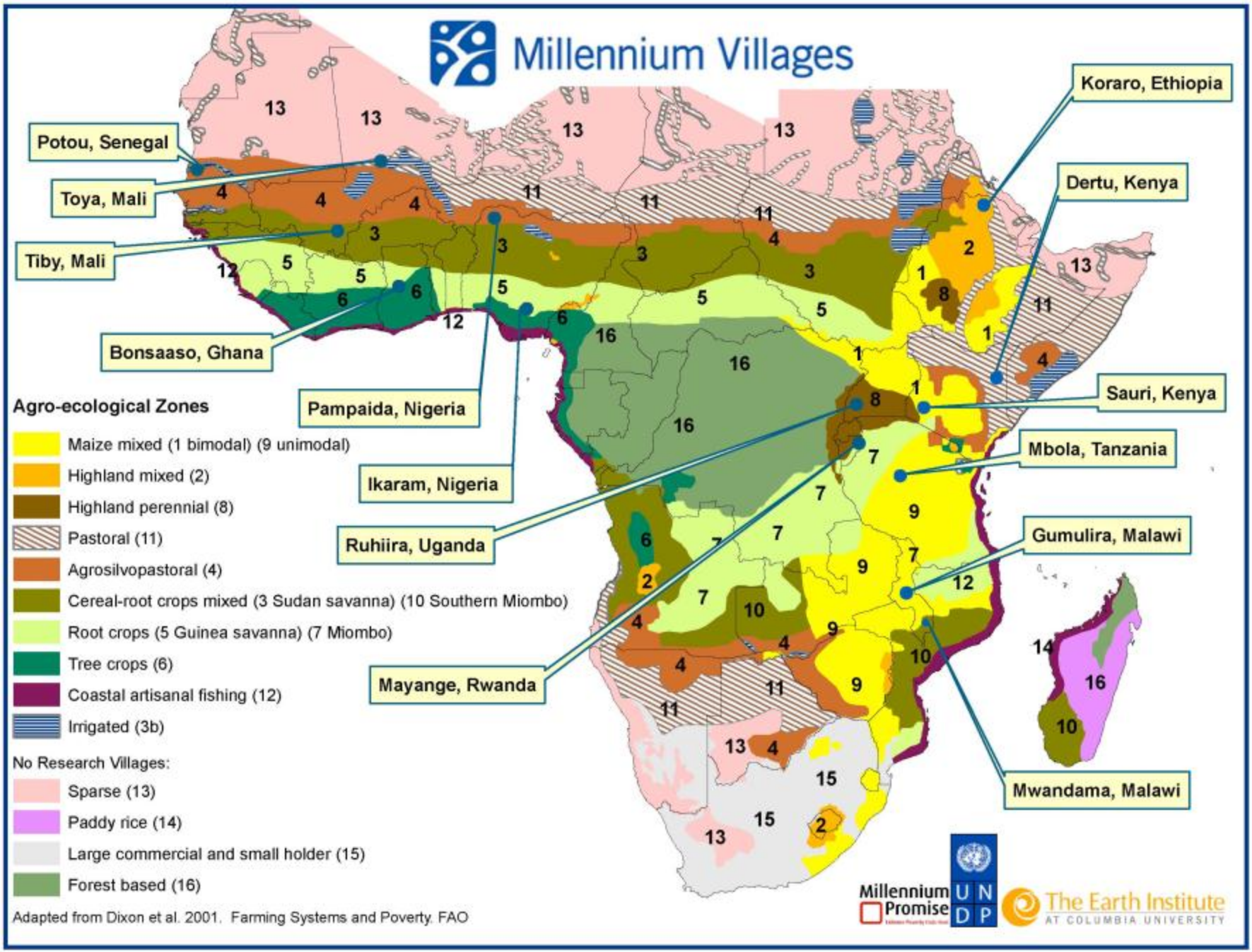
- Construction of high-quality classrooms
- Books and supplies
- Teacher training
- Mid-day meals
- Computers
- Internet connectivity in some schools
- School-to-School program

## HEALTH

- Construction of clinics (Level 3)
- Upgrading hospitals (Level 4)
- Medical supplies
- Improved staffing and salaries for health workers
- Training of Community Health Workers
- Improving access to family planning services

## INFRASTRUCTURE

- Extending cell phone coverage throughout the village
- Internet connectivity in schools, health centers
- Road grading, road construction
- Increasing access to water resources, innovative electrical systems


Millennium Villages
Potou, Senegal
Toya, Mali
Tiby, Mali
Bonsaaso, Ghana
Pampaida, Nigeria
Ikaram, Nigeria
Ruhiira, Uganda
Mayange, Rwanda
Koraro, Ethiopia
Dertu, Kenya
Sauri, Kenya
Mbola, Tanzania
Gumulira, Malawi
Mwandama, Malawi
Agro-ecological Zones
Maize mixed (1 bimodal) (9 unimodal)
Highland mixed (2)
Highland perennial (8)
Pastoral (11)
Agrosilvopastoral (4)
Cereal-root crops mixed (3 Sudan savanna) (10 Southern Miombo)
Root crops (5 Guinea savanna) (7 Miombo)
Tree crops (6)
Coastal artisanal fishing (12)
Irrigated (3b)
No Research Villages:
Sparse (13)
Paddy rice (14)
Large commercial and small holder (15)
Forest based (16)
Adapted from Dixon et al. 2001. Farming Systems and Poverty. FAO
Millennium Promise
UNDP
The Earth Institute
AT COLUMBIA UNIVERSITY

# Year Three Results*

- **7X** increase in bednet usage
- **60%** reduction in malaria prevalence
- **30%** increase in women giving birth in presence of skilled birth attendant
- More than **2x** increase in staple crop yields
- **35%** reduction in chronic undernutrition among children under 2
- **80%** of children receiving school meals
- **3X** increase in access to safe water
- **7X** increase in access to high quality sanitation facilities
- **20%** increase in school coverage

*represents results after three years of implementation across five initial MV sites in Ghana, Kenya, Malawi, Nigeria and Uganda

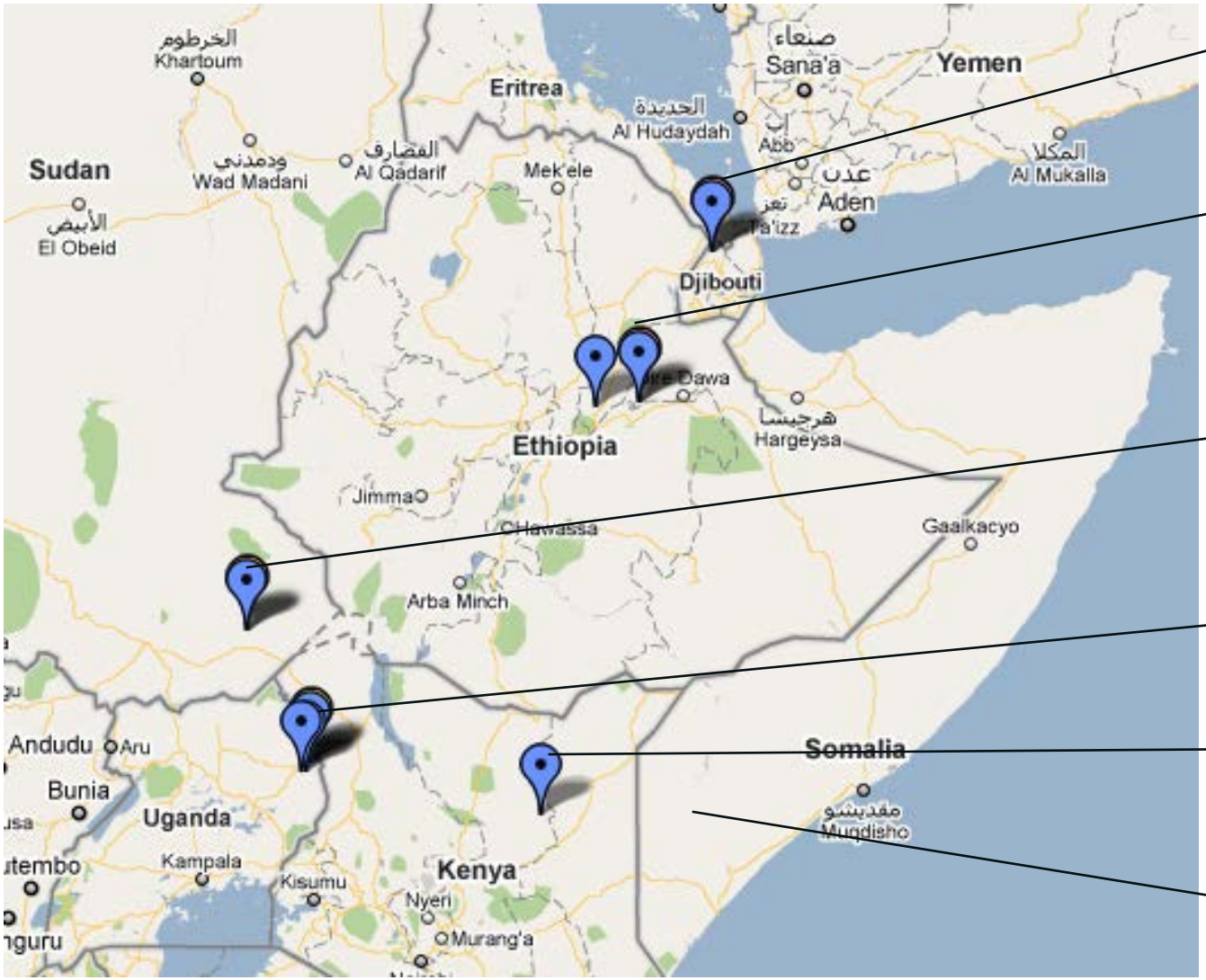
# Some Challenges of the Drylands of East Africa

- Historic under-representation
- High incidence of poverty, food insecurity & malnutrition
- Very low population density and low service delivery
- Severe infrastructure deficit
- High population growth rates
- Localized insecurity

# East African Drylands Alliance

A project in the Horn of Africa to demonstrate that an integrated rural development approach in arid regions can achieve meaningful development gains.

http://www.earth.columbia.edu/articles/view/2713




Khor Angar, Djibouti

Afdem and Amibara, Ethiopia

Eastern Equatoria, S. Sudan (proposed)

Lotome and Lorengedwat, Uganda

Eresaburu and Eldera, Kenya

North & South Somalia (proposed)

# Proposed East African Drylands Initiative Interventions by Sector

| Sector(s) | Proposed Interventions |
|---|---|
| **Health** | New and improved health facilities; Increased access to drugs and bednets; Mobile clinics; Community Health Workers |
| **Education** | New and improved schools (including mobile schools); school meal programs; Availability of supplies; Human resource strengthening |
| **Infrastructure** | New and improved roads; Increased mobile connectivity penetration; Access to modern energy |
| **Livestock and Agriculture** | Provision of veterinary services; Improved livestock marketing; Availability of seeds and fertilizer; Early warning systems for drought |
| **Water and Sanitation** | Access to safe drinking water and basic sanitation; Water points for livestock and irrigation; Construction of dams |
| **Community Development** | Community development groups (pastoral, farming, marketing, etc.); Increased inter-community dialogue |
| **Environment** | Rehabilitate degraded rangeland; Decreased environmental damage at water sites; Improved land management |

# The Beneficiaries: Pastoralists, Agro-Pastoralists

# Nigeria MDG Scale Up:

# The Conditional Grant Scheme for

# Local Government Areas (2011)

# Nigeria's MDGs Conditional Grants Scheme (CGS): Concept and Local Government Initiative

- **The Conditional Grants Scheme for States was introduced in 2007**
  - **Funded from the Debt-Relief Gains as overseen by the Office of the SSAP-MDGs**
  - **Introduced in response to low implementation rates and poor consultation of Federal Ministries and Agencies with State/Local Government and communities**
  - **In 2011 seeking to engage and support Local Government Areas in achieving the MDGs**

# Objective of the CGS Starting in 2007

- Investing in the MDGs at the State &LGA Level and ensuring ownership and sustainability
- Empowering State and Local Government to carry out their constitutional responsibilities
- Promoting improvements in public service delivery
- Encouraging improvements in public expenditure reform,
- Strengthening the partnership between the three tiers of government for national planning

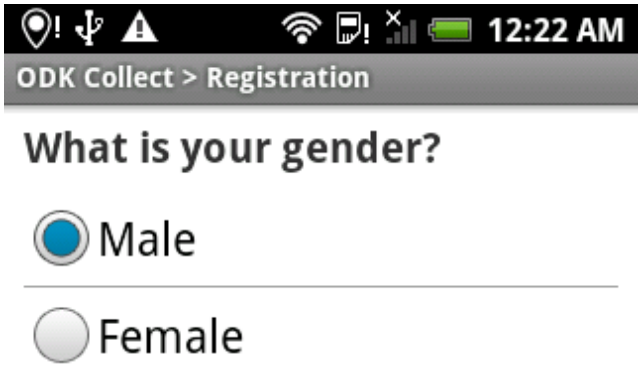
# Extending Engagement to LGAs in 2011

- Building on the successes of the State track of the CGS by providing grants for integrated investments focused on specific LGAs
- Responding to observed weaknesses in the service delivery chain that prevent access to essential services
- Empowering LGAs to fulfil their constitutional responsibilities for primary healthcare and education
- Facilitating deeper involvement of communities in local development through Local Government

# Data Collection in LGAs Using Android Smartphones

# GPS Coordinates

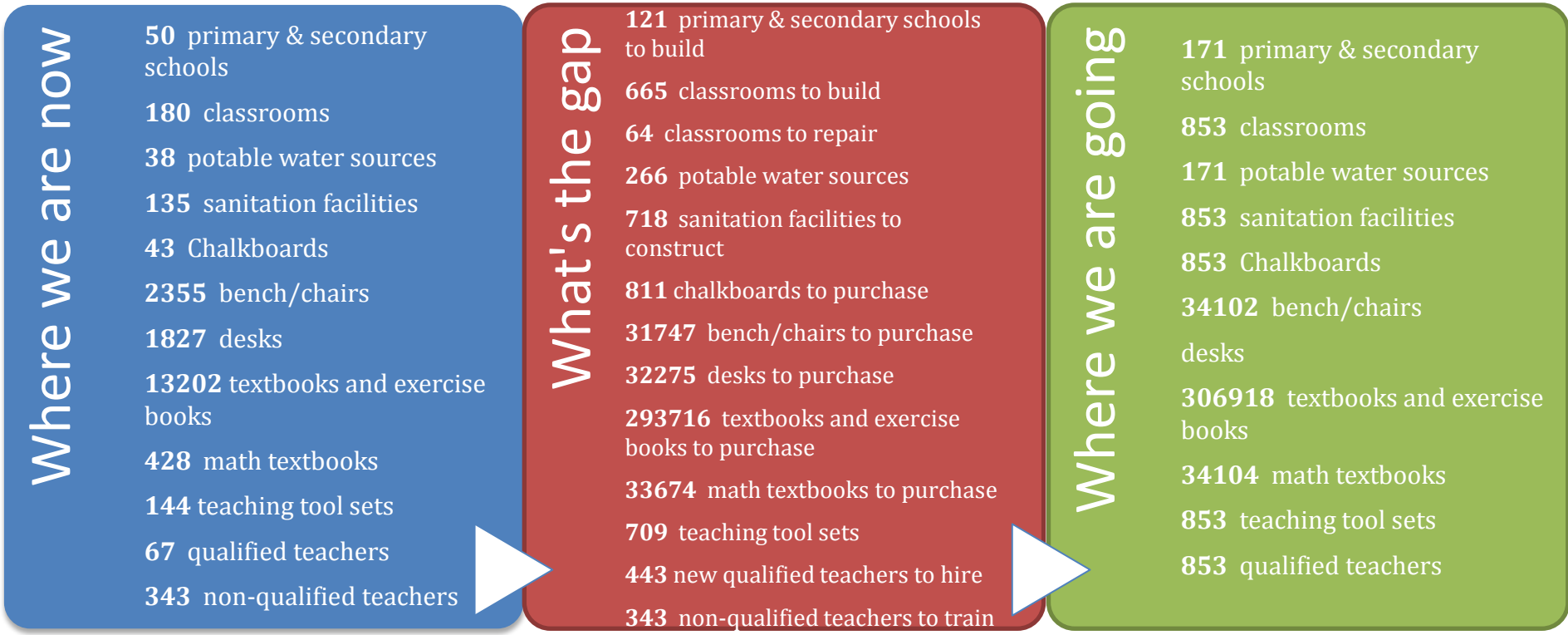
# Multiple Choice



# Text

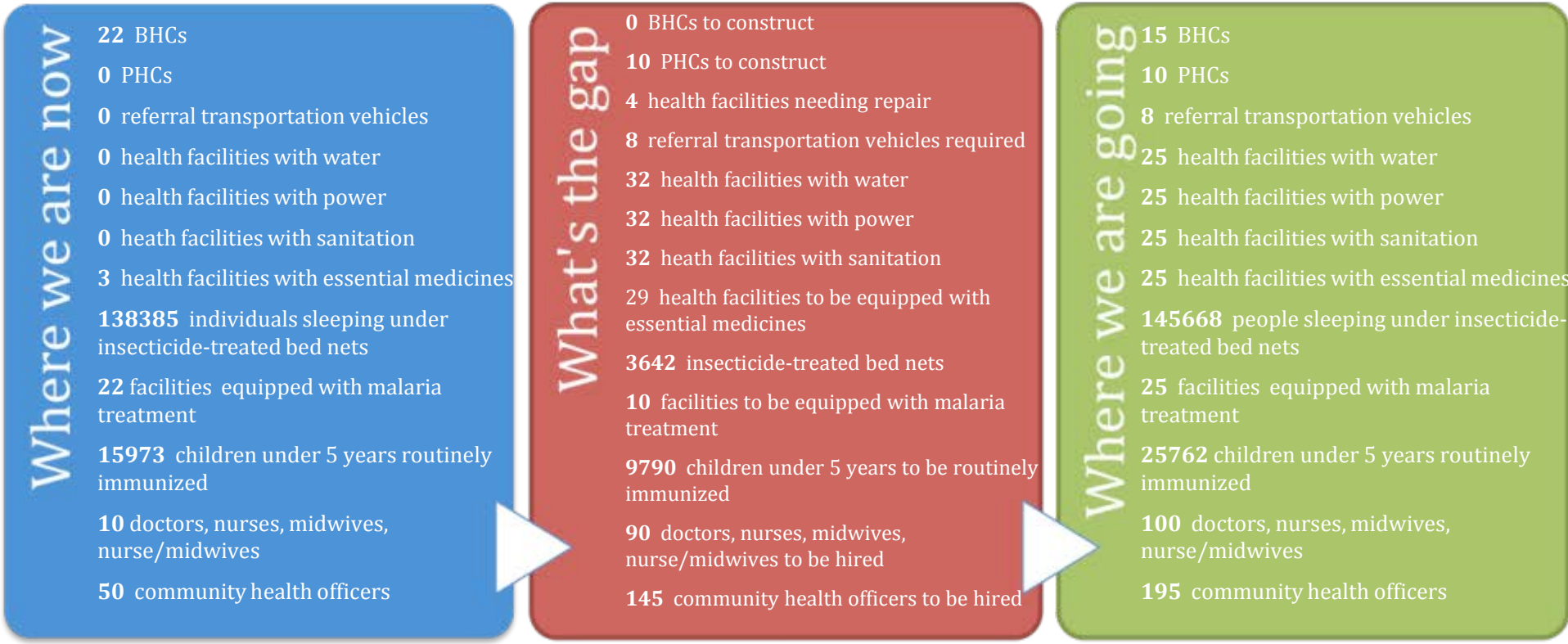

11:57 PM
ODK Collect > Water
Which school or health clinic is this scheme / source closest to?
q w e r t y u i o p
a s d f g h j k l
z x c v b n m DEL
?123
.

# Nigeria MDG Scale up Initiative
# Quick Needs Assessment: Education




Sample from Miga LGA in Jigawa State, Nigeria

# Nigeria MDG Scale Up Initiative
# Quick Needs Assessment: Health



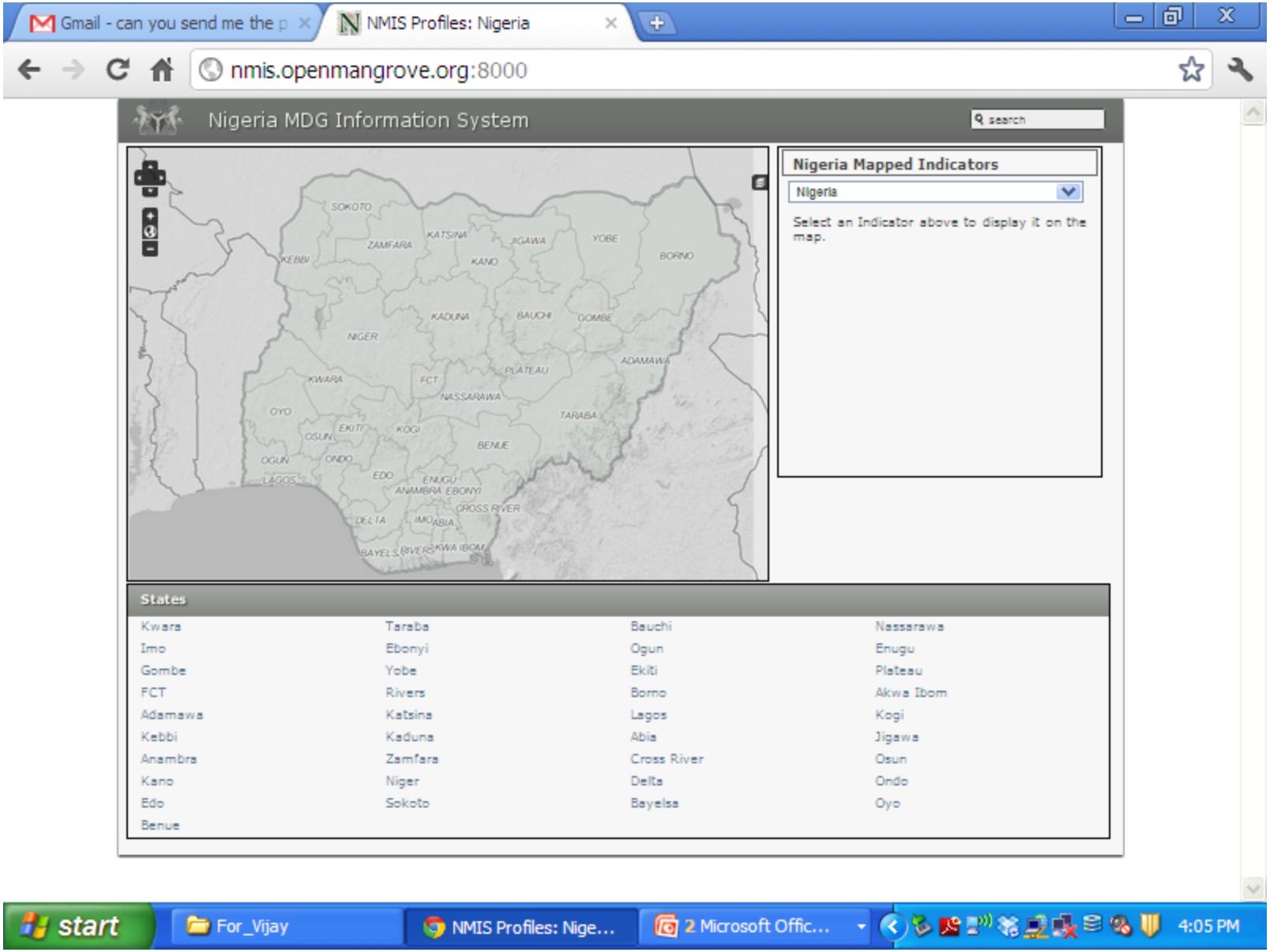

Sample from Miga LGA in Jigawa State, Nigeria

# Health Needs Assessment
# Miga, Jigawa
# Nigeria

| HEALTH RAPID GAP ANALYSIS (Miga, Jigawa) | | |
|---|---|---|
| | NUMBER | GAP |
| Population of the LGA | 145668 | |
| Population of LGA <5 years | 25762 | |
| Number of wards (est) | 7 | |
| **FACILITIES PER POPULATION** | | |
| BHCs (including Health Posts and Dispensaries) per population (target) | 15 | |
| PHCs per population (target) | 10 | |
| Existing BHCs | 22 | |
| Existing PHCs | 0 | |
| Health facilities with maternal health/emergency delivery capacity | 1 | |
| **Gap (BHCs needing construction)** | | 0 |
| **Gap (PHCs needing construction)** | | 10 |
| **Gap (total health facilities needing repair)** | | 4 |
| **EQUIPMENT/INFRASTRUCTURE** | | |
| Emergency referral transportation (target) | 7 | |
| Emergency referral transportation (existing) | 0 | |
| **Gap (emergency referral transportation to be purchased)** | | 7 |
| Healthcare facilities with water (target) | 25 | |
| Healthcare facilities with water | 0 | |
| **Gap (existing healthcare facilities needing water)** | | 22 |
| **Gap (new healthcare facilities needing water)** | | 10 |
| Healthcare facilities with power (target) | 25 | |
| Healthcare facilities with power | 0 | |
| **Gap (existing healthcare facilities needing power)** | | 22 |
| **Gap (new healthcare facilities needing power)** | | 10 |
| Healthcare facilities with sanitation (target) | 25 | |
| Healthcare facilities with sanitation (existing) | 0 | |
| **Gap (existing healthcare facilities needing sanitation)** | | 22 |
| **Gap (new healthcare facilities needing sanitation)** | | 10 |
| **DRUGS, VACCINES, AND DIAGNOSTICS** | | |
| Health facilities with essential medicines (target) | 25 | |
| Health facilities with essential medicines (existing) | 3 | |
| **Gap (existing healthcare facilities needing medicines)** | | 19 |
| **Gap (new healthcare facilities needing medicines)** | | 10 |

# Nigeria Management Information Systems (NMIS)

- Single, easy-to-use, open-source system
- Brings together data from multiple sectors and multiple sources
- Display and visualize
  - See it on the map, see the facility
- Real-time progress
  - Rapid data upload using mobile technologies
  - Facility data + potential for community-level data
- Two-way information flow
  - Feedback to the ground/program managers
- Housed in-country


Gmail - can you send me the p
NMIS Profiles: Nigeria
nmis.openmangrove.org:8000
Nigeria MDG Information System
search
SOKOTO
ZAMFARA
KATSINA
JIGAWA
YOBE
BORNO
KEBBI
KANO
KADUNA
BAUCHI
GOMBE
NIGER
ADAMAWA
PLATEAU
KWARA
FCT
NASSARAWA
TARABA
OYO
EKITI
KOGI
OSUN
BENUE
ONDO
OGUN
EDO
ENUGU
LAGOS
ANAMBRA
EBONYI
CROSS RIVER
DELTA
IMO
ABIA
BAYELSA
RIVERS
AKWA IBOM
Nigeria Mapped Indicators
Nigeria
Select an Indicator above to display it on the map.
States
Kwara
Taraba
Bauchi
Nassarawa
Imo
Ebonyi
Ogun
Enugu
Gombe
Yobe
Ekiti
Plateau
FCT
Rivers
Borno
Akwa Ibom
Adamawa
Katsina
Lagos
Kogi
Kebbi
Kaduna
Abia
Jigawa
Anambra
Zamfara
Cross River
Osun
Kano
Niger
Delta
Ondo
Edo
Sokoto
Bayelsa
Oyo
Benue
start
For_Vijay
NMIS Profiles: Nige...
2 Microsoft Offic...
4:05 PM

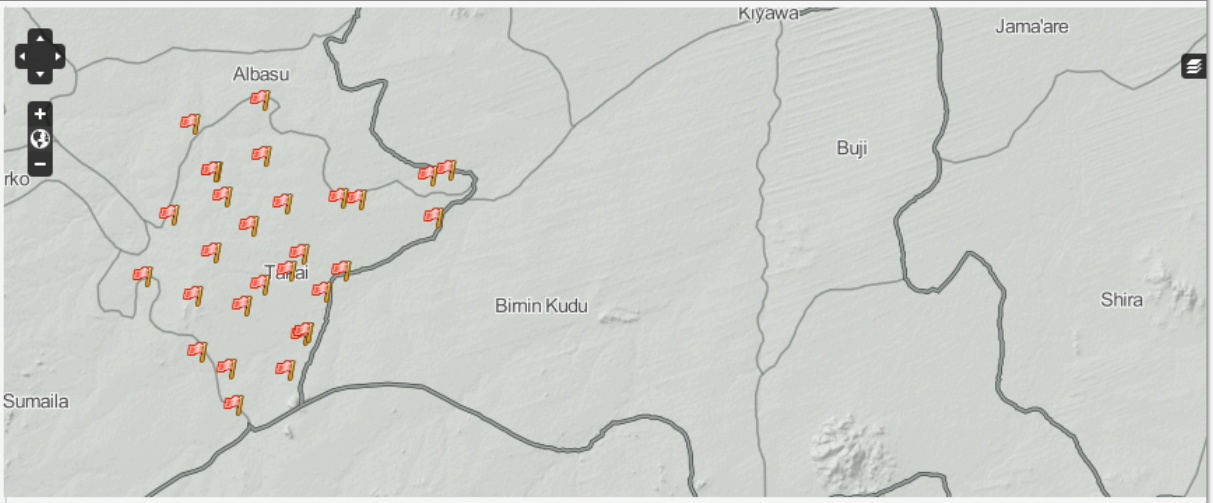
# Nigeria MDG Information System

search

Nigeria > Kano > Takai

Facilities | MDG Indicators

- Kano
  - Nassarawa
  - Rimin Gado
  - Ungongo
  - Wudil
  - Doguwa
  - Albasu
  - Kiru
  - Shanono
  - Kano Municipal
  - Kunchi
  - Tofa
  - Bichi
  - Warawa
  - Garko
  - Makoda
  - Bunkure
  - Dawakin Kudu
  - Gezawa
  - Bebeji
  - Ajingi
  - Tsanyawa
  - Gabasawa
  - Minjibir
  - Kura
  - Takai »
  - Bagwai
  - Gwarzo
  - Rogo
  - Karaye
  - Garun Mallam
  - Sumaila
  - Kabo
  - Dawakin Tofa
  - Kumbotso
  - Fagge

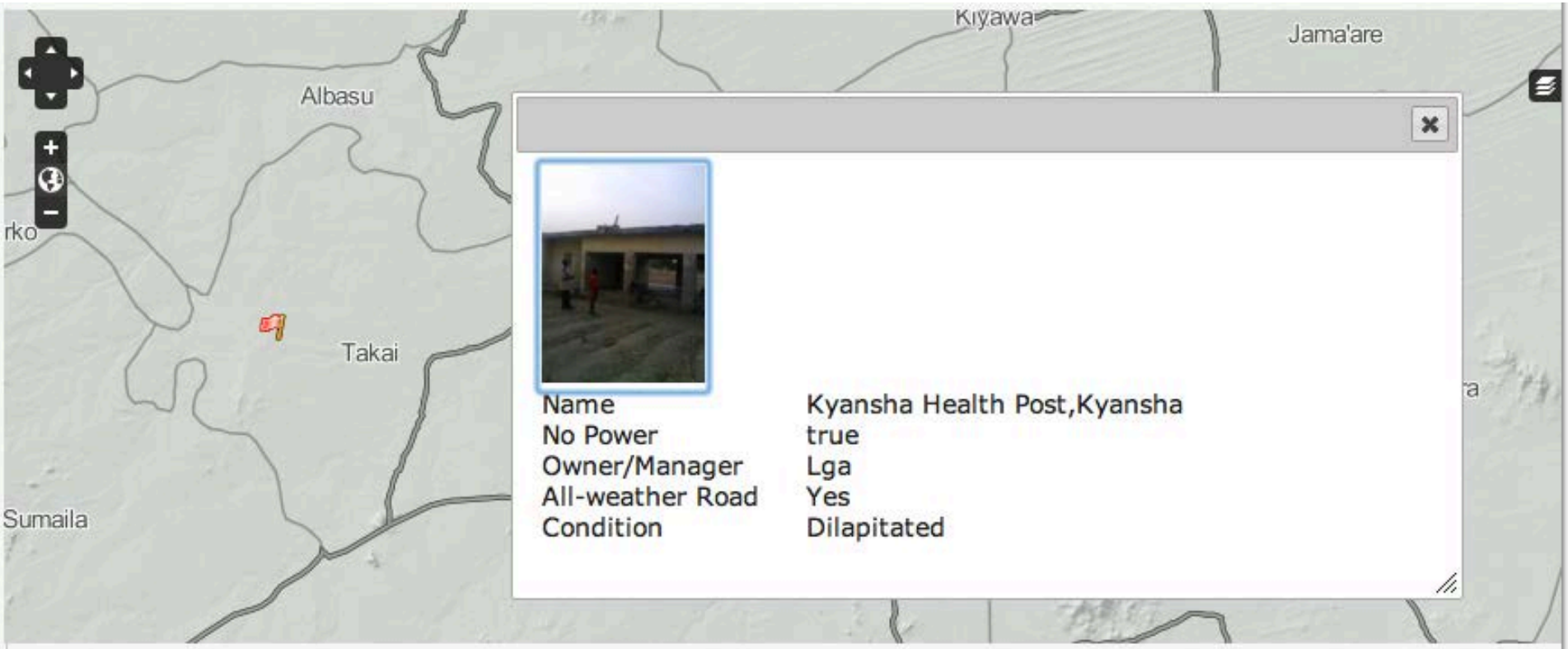



Water (208) | Education (90) | Health (31)

| | | | | |
|---|---|---|---|---|
| Kogo H/ Post | true | Lga | No | Dilapitated |
| Awazara Health Post | true | Lga | No | Dilapitated |
| Kyansha Health Post,Kyansha | true | Lga | Yes | Dilapitated |
| Dispensary | true | Lga | Yes | Poorly Maintained |
| Karifi Dispensery | true | Lga | Yes | Dilapitated |
| Fajewa Health Clinic | true | Stategovernment | Yes | Dilapitated |
| Kacako Dispensary | true | Lga | Yes | Poorly Maintained |
| Kaniyaka Health Post | true | Lga | Yes | Dilapitated |

**All weather road access.**

- Yes: 22 (70.9%)
- No: 9 (29%)

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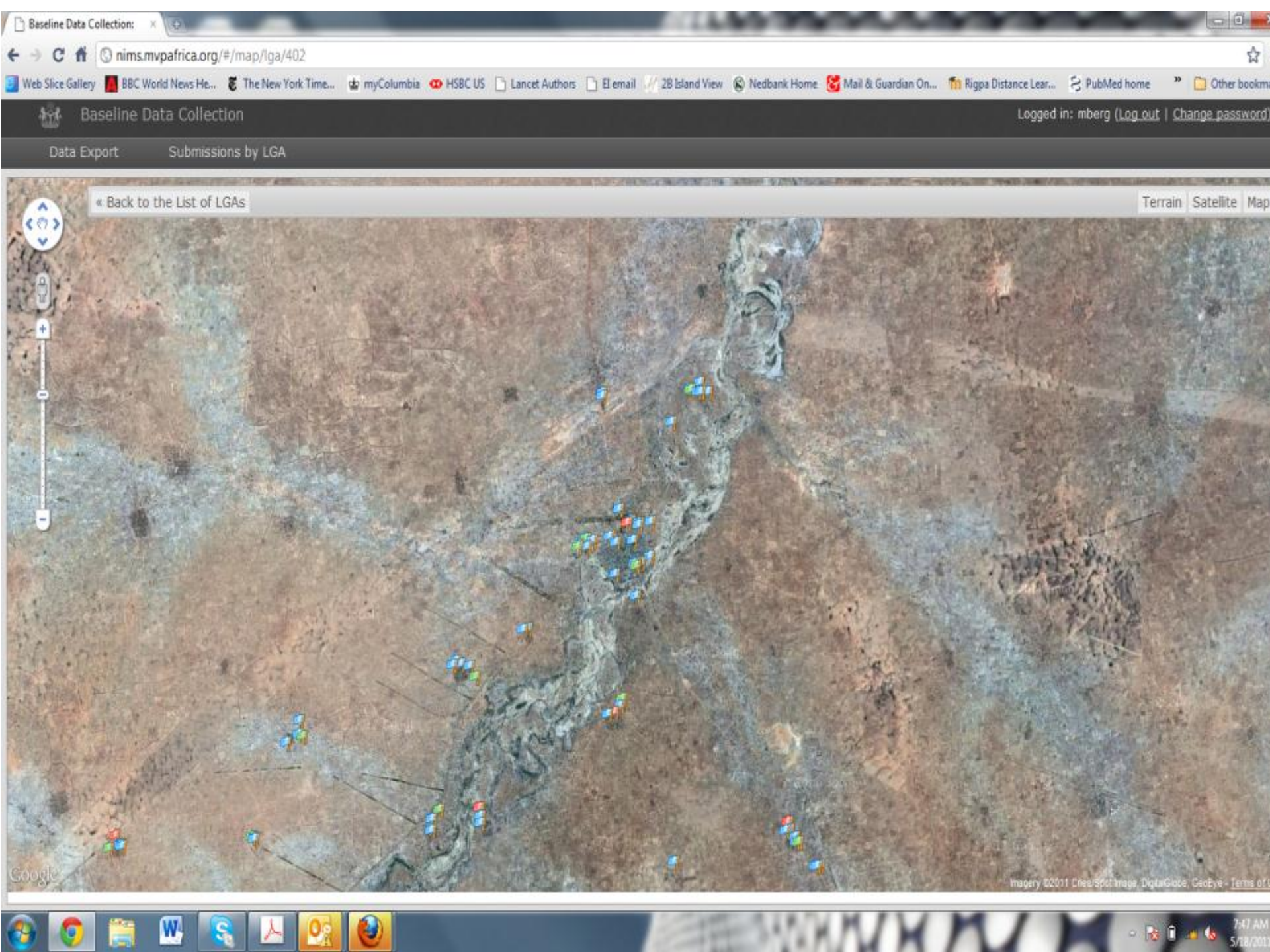
| Kaniyaka Health Post | true | Lga | Yes | Dilapitated |

# NMIS Database Map View:

- **Zoom in to the Local Government Area (LGA)**
  -different colored flags indicate where facilities are located
  -green = schools, blue = water points, red = health clinics

- **Click on a flag to view data gathered on that facility**
  -in this case we selected a green (school) flag in Kaita LGA in Katsina State
  -click on the icon to see a picture of the facility


Baseline Data Collection:
nims.mvpafrica.org/#/map/lga/402
Web Slice Gallery
BBC World News He...
The New York Time...
myColumbia
HSBC US
Lancet Authors
El email
2B Island View
Nedbank Home
Mail & Guardian On...
Rigpa Distance Lear...
PubMed home
Other bookm
Baseline Data Collection
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Data Export
Submissions by LGA
« Back to the List of LGAs
Terrain
Satellite
Map
Google
Imagery ©2011 Cnes/Spot Image, DigitalGlobe, GeoEye - Terms of
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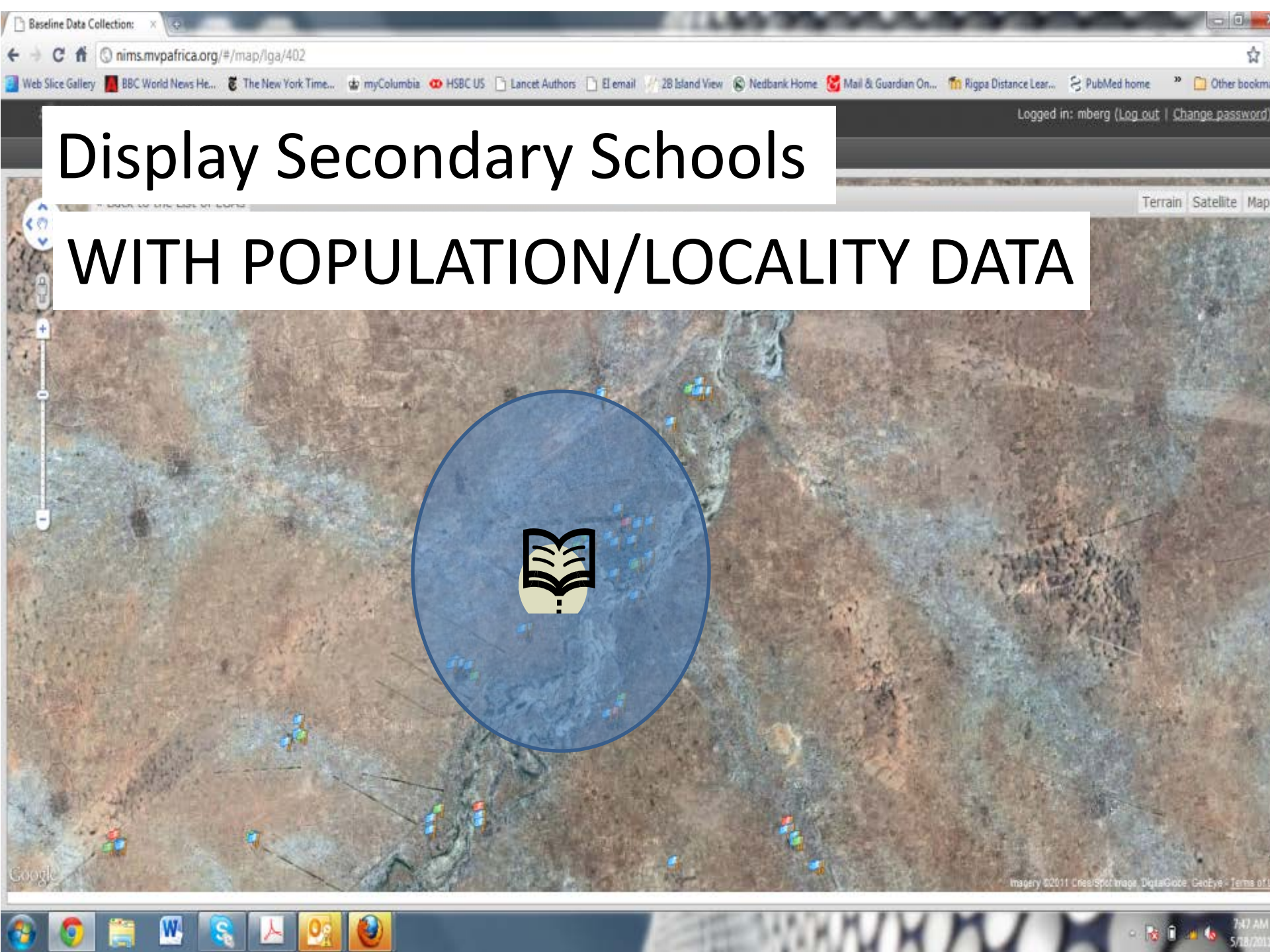
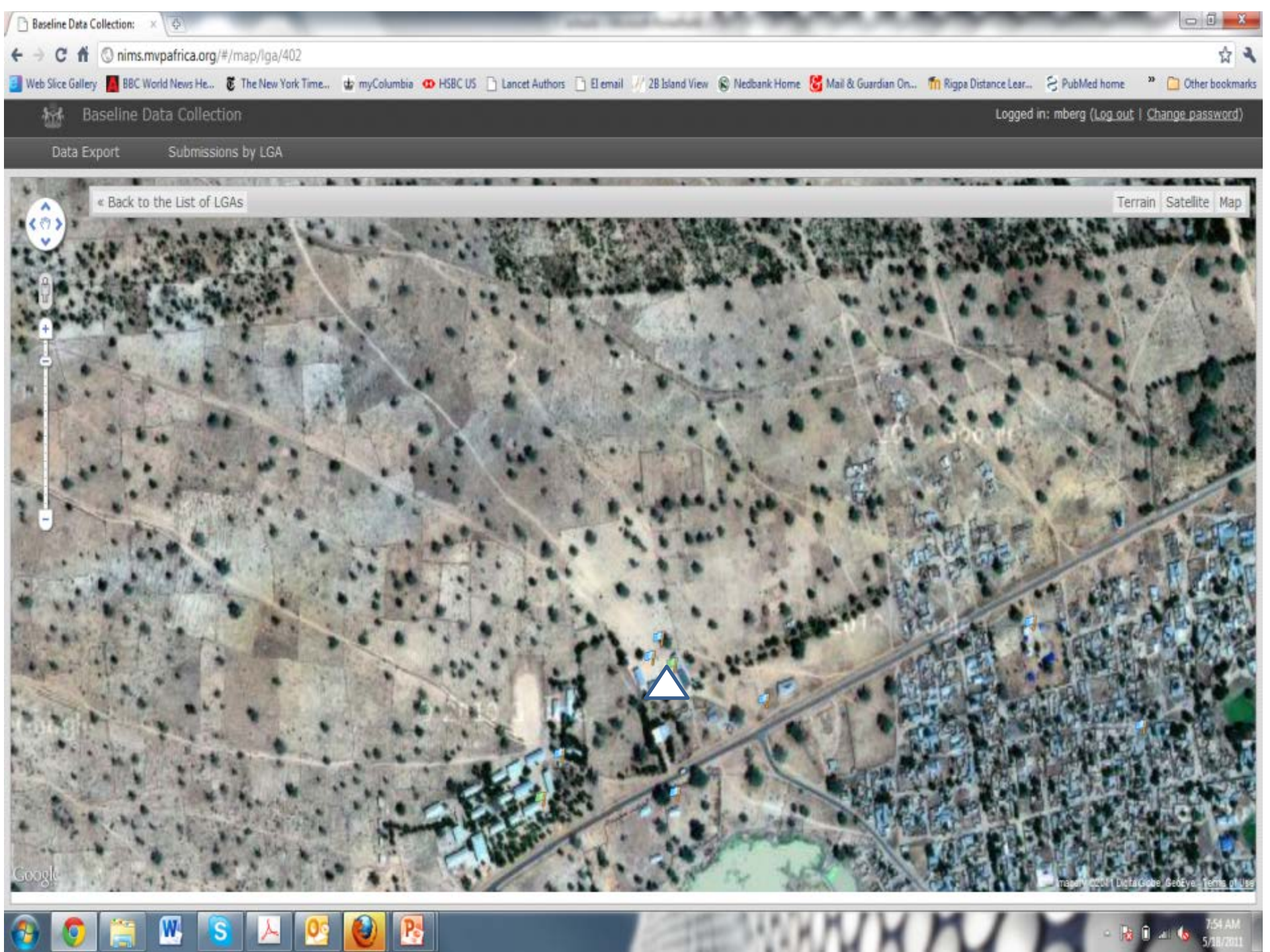
5/18/2011

# Display Secondary Schools

# WITH POPULATION/LOCALITY DATA




Baseline Data Collection:
nims.mvpafrica.org/#/map/lga/402
Web Slice Gallery
BBC World News He...
The New York Time...
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HSBC US
Lancet Authors
El email
2B Island View
Nedbank Home
Mail & Guardian On...
Rigpa Distance Lear...
PubMed home
Other bookmarks
Baseline Data Collection
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Data Export
Submissions by LGA
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Map
Google
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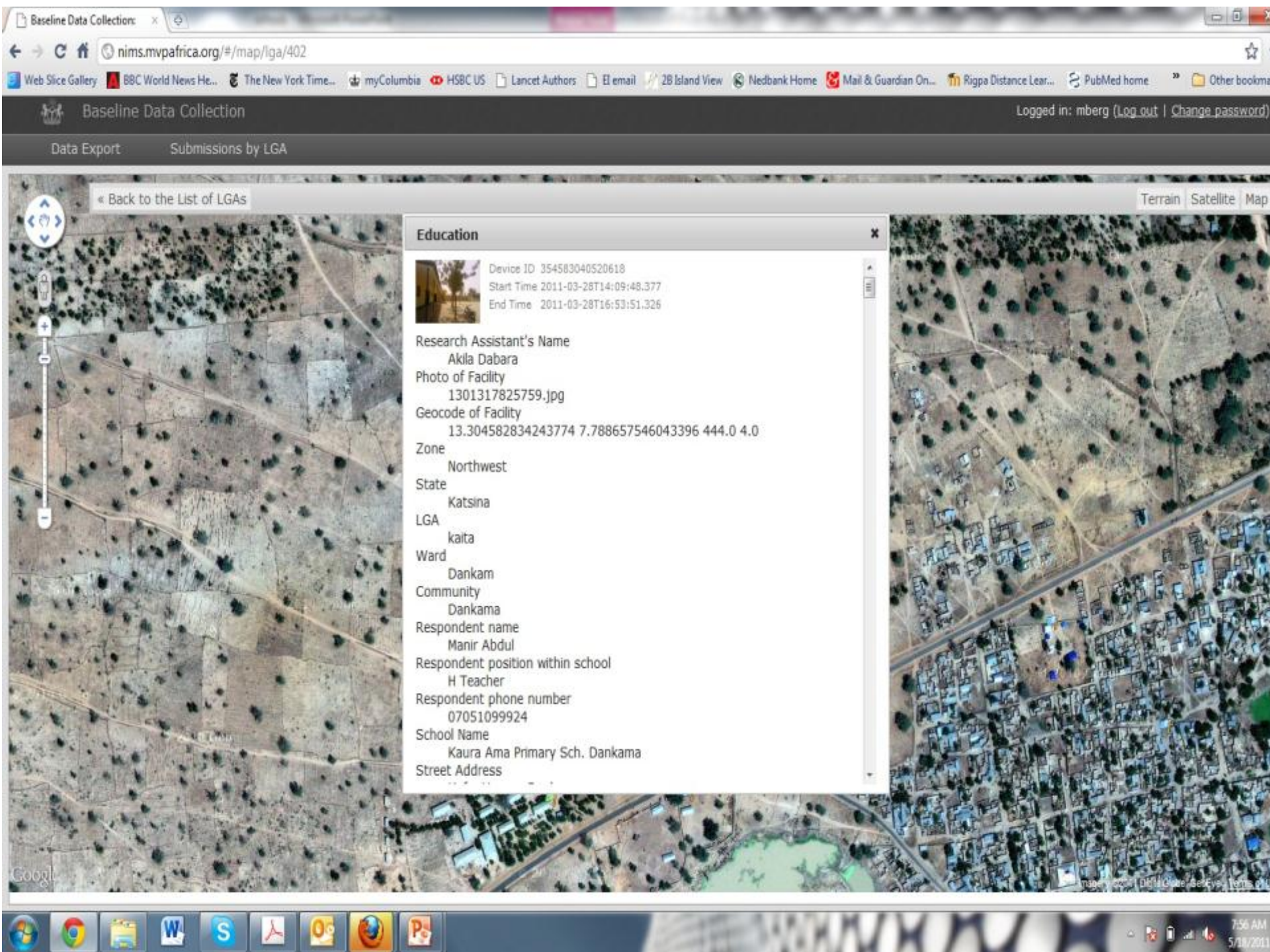

Baseline Data Collection
nims.mvpafrica.org/#/map/lga/402
Baseline Data Collection
Logged in: mberg (Log out | Change password)
Data Export
Submissions by LGA
« Back to the List of LGAs
Terrain
Satellite
Map
Education
Device ID 354583040520618
Start Time 2011-03-28T14:09:48.377
End Time 2011-03-28T16:53:51.326
Research Assistant's Name
Akila Dabara
Photo of Facility
1301317825759.jpg
Geocode of Facility
13.304582834243774 7.788657546043396 444.0 4.0
Zone
Northwest
State
Katsina
LGA
kaita
Ward
Dankam
Community
Dankama
Respondent name
Manir Abdul
Respondent position within school
H Teacher
Respondent phone number
07051099924
School Name
Kaura Ama Primary Sch. Dankama
Street Address

# Rapid Scale Up of Primary Health Care Using Community Health Workers

# Key Steps for Health Scale-Up:

- **Identify Interventions**
- **Quantitative Targets**
- **Campaign Mode**
- **National Plans**
- **Financing Mechanism (Global Fund, GAVI, others)**
- **Partners and Implementation Management (UN, countries, regional bodies, companies, NGOs, foundations)**
- **Monitoring, Audits**

# Scale-up of CHWs

## 6 WHO Health System building blocks for the CHW (plus one):

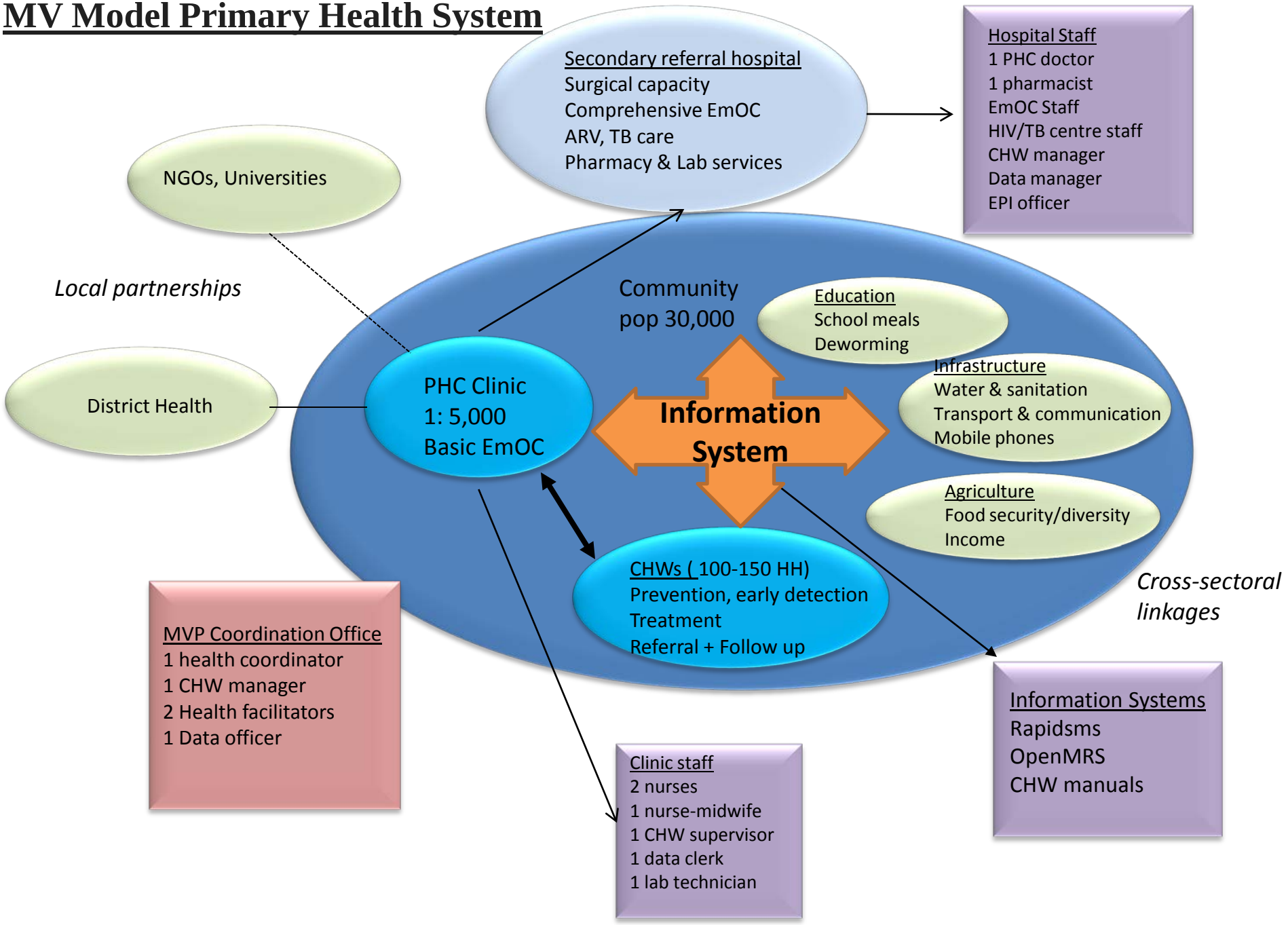
1. Service Delivery – Defining the extension pattern and suite of interventions
2. Health workforce – Determining the profile of a CHW and remuneration/incentives
3. Information Systems – Data for ongoing management and evaluation, mHealth
4. Medicines, Point of Care Diagnostics – Transforming the capabilities of a CHW
5. Financing – Salaries, Motivation and Incentives (backpacks, bikes, uniforms etc)
6. Leadership and Management – Multiple layers of oversight includes community
7. Community Mobilization and Engagement – Foundational and cross cutting

http://millenniumvillages.org/files/2011/06/1mCHW_TechnicalTaskForceReport.pdf

# Who are the Community Health Workers?

# Community Health Workers

# MV Model Primary Health System



# 5 Goals for CHILDCOUNT+

Malaria Rapid Diagnostic Test Report

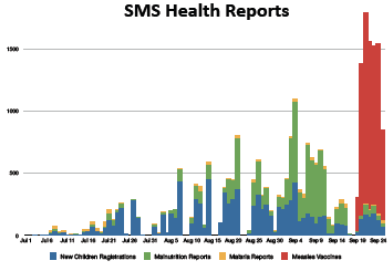
MRDT +28 Y N D CV

Code Patient ID Positive? (Y/N) Bednet? (Y/N) Symptoms

V = Vomiting, F = Fever, D = Diarrhea
A = Appetite Loss, CG = Chronic Cough
CF = Confusion, NR = Non Responsive
CV = Convulsions, UF = Unable to Feed

MRDT> Child +28, DIALLO Fatima M/13m has MALARIA. Child is less than 3. Please provide 1 tab of Coartem (ACT) twice a day for 3 days.

SMS Health Reports



**Monitor for malaria, diarrhea, and pneumonia**

*Nyawara Clinic*

| # | PROVIDER | TOTAL CASES | # NEW CASES | MRDT | MUAC | RATE | LAST ACTVITY |
|---|---|---|---|---|---|---|---|
| 1 | Solomon Wasambo | 116 | 17 | 10 | 112.97% (112/116) | 92% (128/140) | 1 days ago |
| 2 | Emily Aoko | 81 | 3 | 3 | 76.94% (76/81) | 100% (49/49) | 1 days ago |
| 3 | Josephine Otieno | 87 | 8 | 0 | 83.95% (83/87) | 86% (53/61) | 2 days ago |
| 4 | Jacob Ochieng | 73 | 5 | 1 | 66.90% (66/73) | 100% (35/35) | 1 days ago |
| 5 | Lawrence Ogoga | 55 | 11 | 4 | 3.5% (3/55) | 80% (37/46) | 1 days ago |
| 6 | Salome Abonyo | 71 | 2 | 1 | 30.42% (30/71) | 94% (16/17) | 2 days ago |
| 7 | Wycliffe Okol | 116 | 2 | 6 | 118.102% (118/116) | 100% (59/59) | 1 days ago |
| 8 | Peter Onyango | 99 | 3 | 0 | 86.87% (86/99) | 93% (44/47) | 1 days ago |
| 9 | Godfrey Nyateng | 73 | 4 | 1 | 71.97% (71/73) | 89% (68/76) | 1 days ago |
| 10 | Frederick Odhiambo | 109 | 52 | 0 | 81.74% (81/109) | 100% (166/166) | 1 days ago |
| 11 | Josephine Mutitu | 55 | 39 | 3 | 30.55% (30/55) | 89% (114/127) | 1 days ago |
| 12 | Lilian Okello | 65 | 1 | 3 | 68.105% (68/65) | 94% (52/55) | 2 days ago |
| 13 | Maurine Akinyi | 107 | 11 | 0 | 88.82% (88/107) | 64% (38/45) | 1 days ago |
| | Summary | 1107 | | 32 | 82.% (912/1107) | 93% (860/923) | |

**Record all births and death**

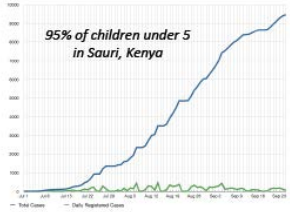
Child Registration

new diallo fatimata f 110408 amie 324245

CODE Last First Gender(M/F) DOB(ddmmyy) Guardian Contact #

PATIENT REGISTERED> +28: DIALLO Fatimata. 4/13M. Mother: Amie, Village: Kangaba

**Register every child**




*Amyiko: Carolyne Aieko*

CHW Child Reports

**Full child immunization report**

MEASLES +452 +5652 +324 +8425

| Vaccinated | Eligible | Coverage |
|---|---|---|
| 7574 | 8083 | 94% |

**Screen for malnutrition every 90 days**

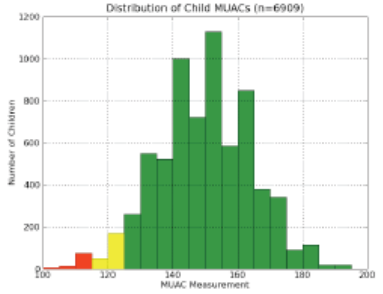
Nutrition Screening Report

MUAC +28 105 E V D

CODE Patient ID MUAC (mm) Edema (E/N) Symptoms

V = Vomiting, F = Fever, D = Diarrhea
A = Appetite Loss, CG = Chronic Cough
CF = Confusion, NR = Non Responsive
CV = Convulsions, UF = Unable to Feed

MUAC> Child +28 Fatimata Diallo F/13M has SAM+. Please bring child in for IMMEDIATE inpatient care.



## Informal counselling

## Structured consultation

CHW's

Cluster Clinics

District Hospital

Teaching Hospital

Emergency number

Emergency medical transport vehicle

# Mobile-based Telemedicine Services

# OFF-GRID Infrastructure

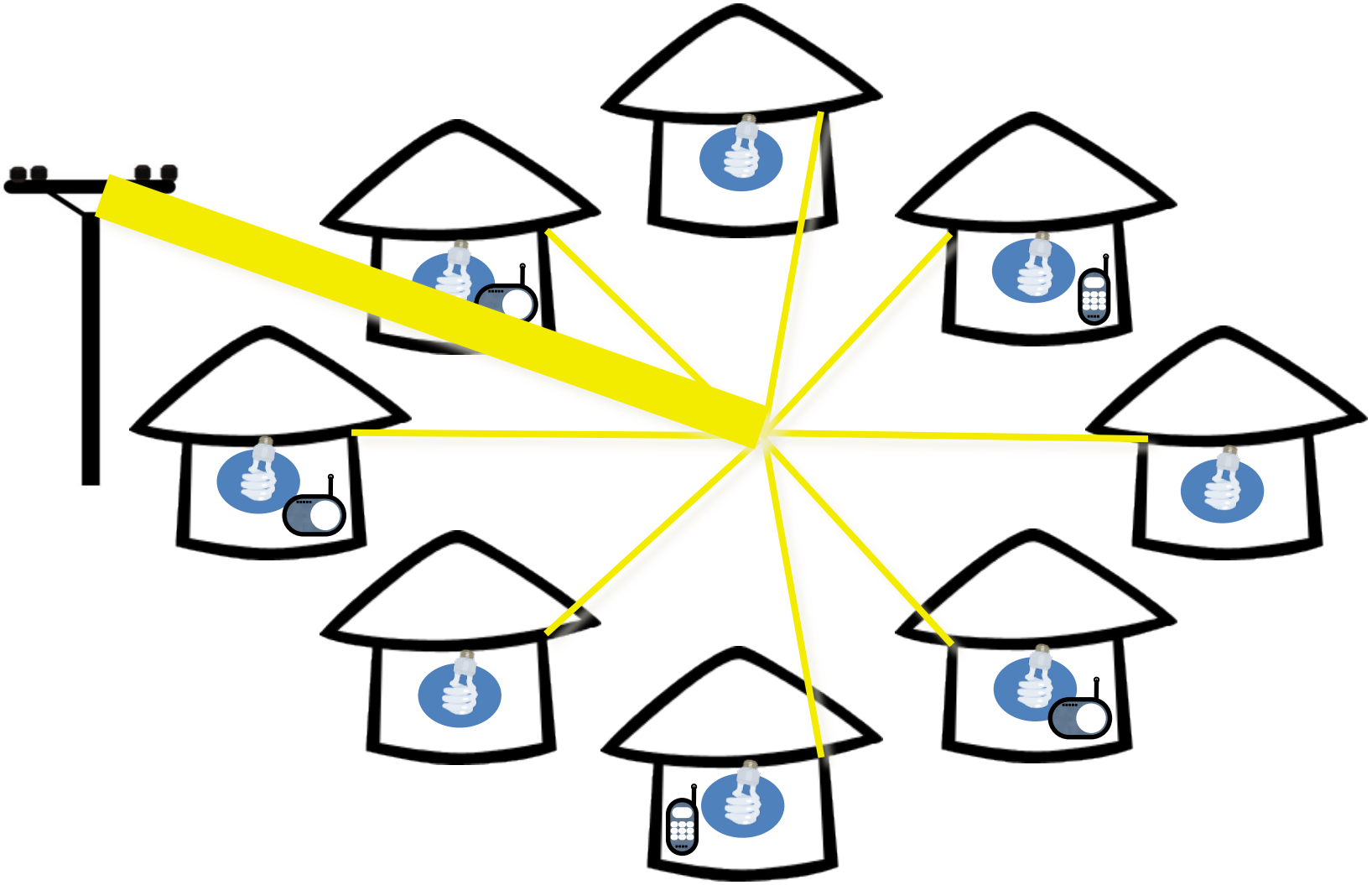

## Contributors

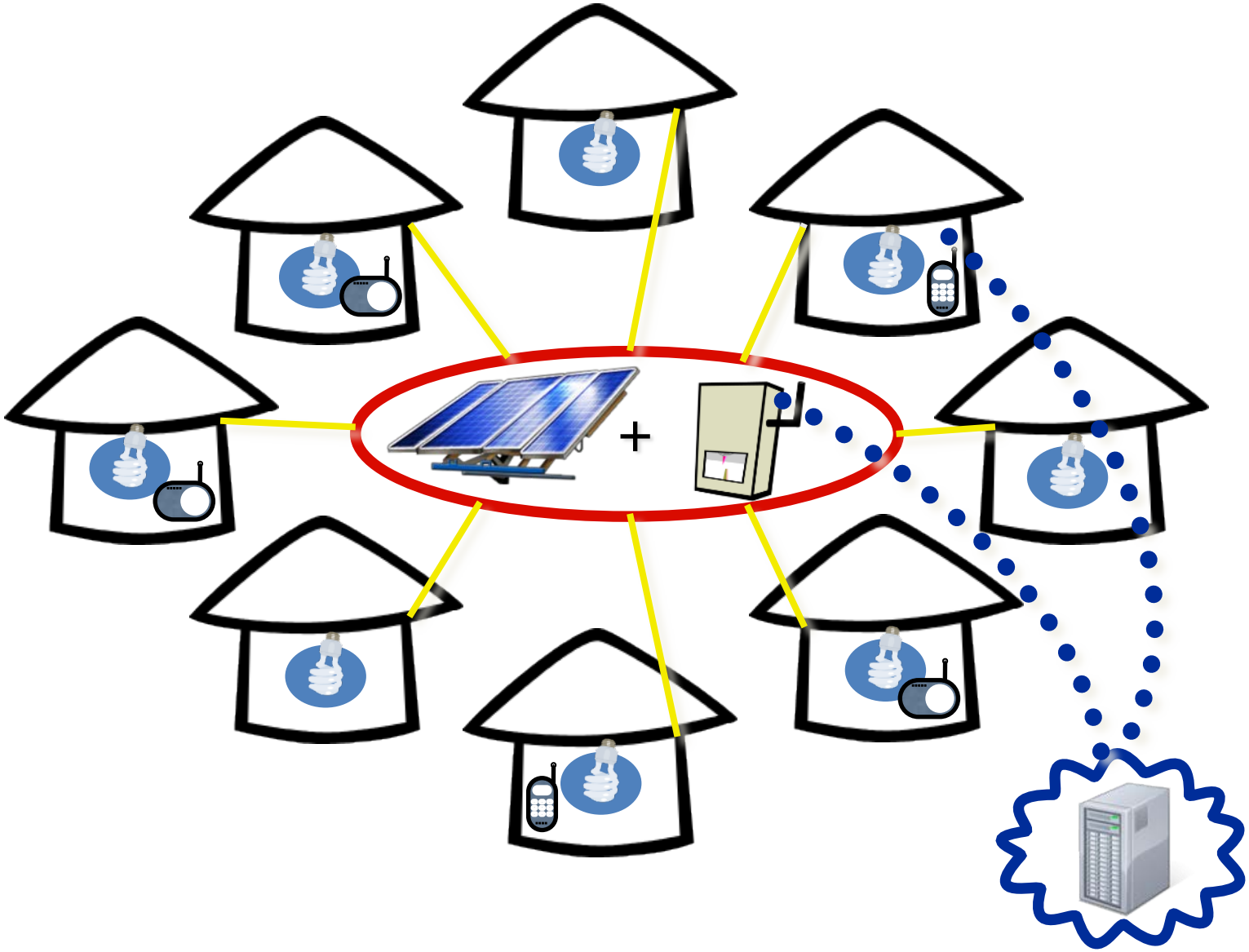
Edwin Atkins, Matt Basinger, Michael Benedict, Eric Brewer, Harrison Chiu, Justin Elszasz, Kate Kennedy Freeman, Emilio Simonet Jiménez, Levi Kingery, Yancheng Li, Achintya Madduri, Scott McNeil, Rajesh Menon, Javier Rosa, FS Rodriguez Sanchez, John Sarik, Daniel Soto, Ivan Willig

Vijay Modi (modi@columbia.edu)

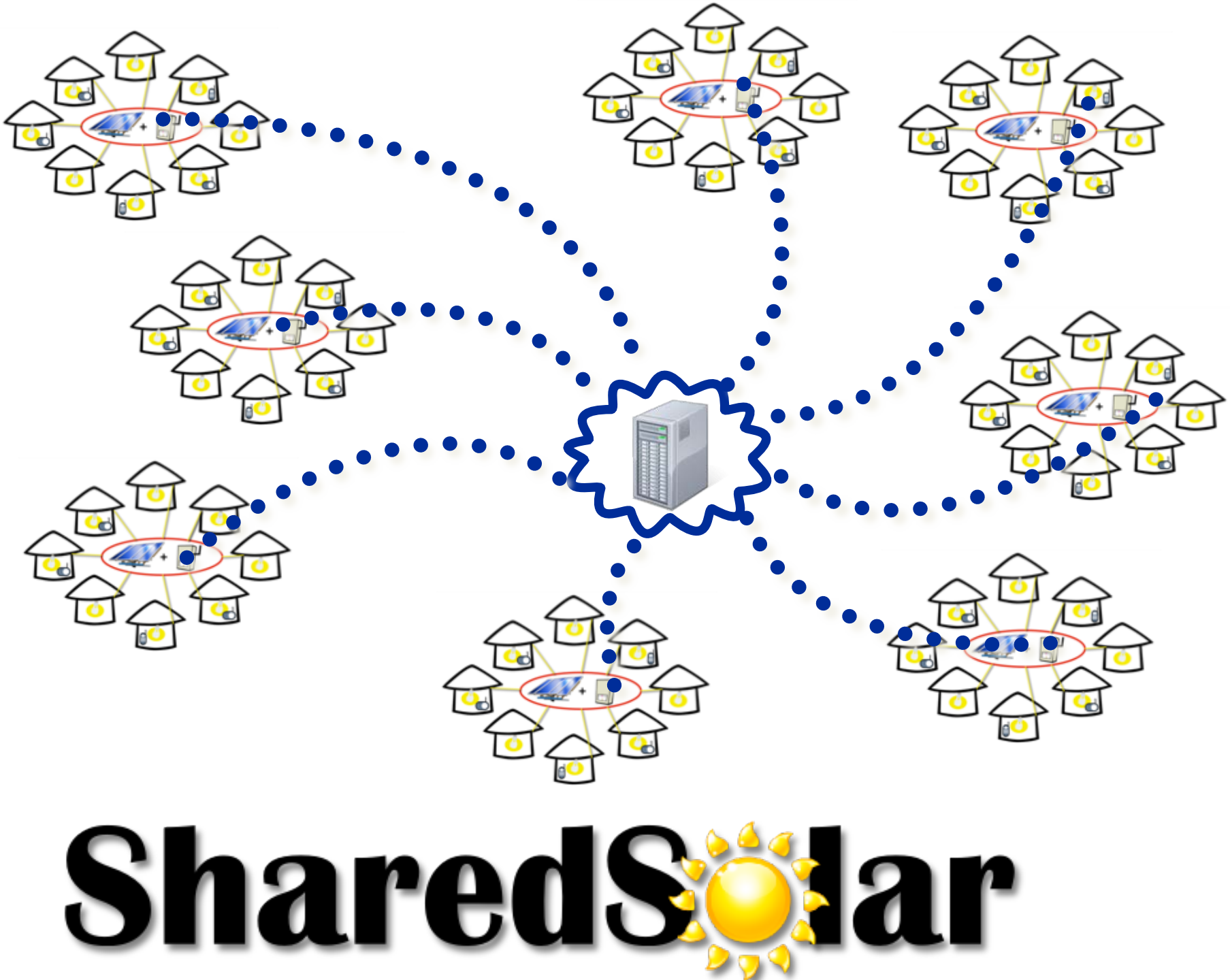
# What do the poor pay?

- $2 to $8 per month
- **Not consistently-cannot pay every month in one monthly payment**
- For less than 1 kWh equivalent (in form of kerosene, batteries), or >$5/kWh
- **Our approach: developed a PAY AS YOU GO MODEL with low initial cost to consumer and low transaction costs for payments.**

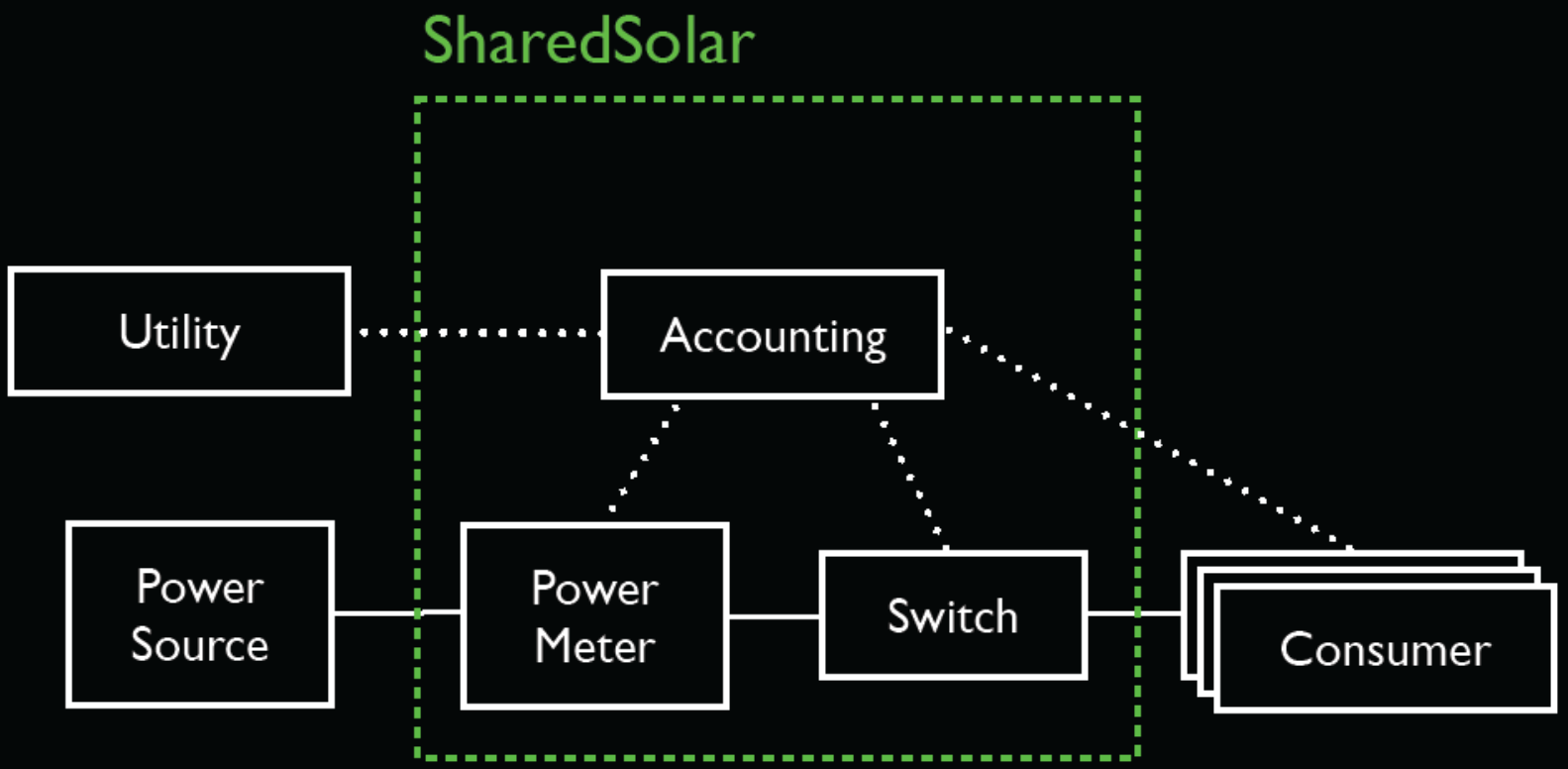




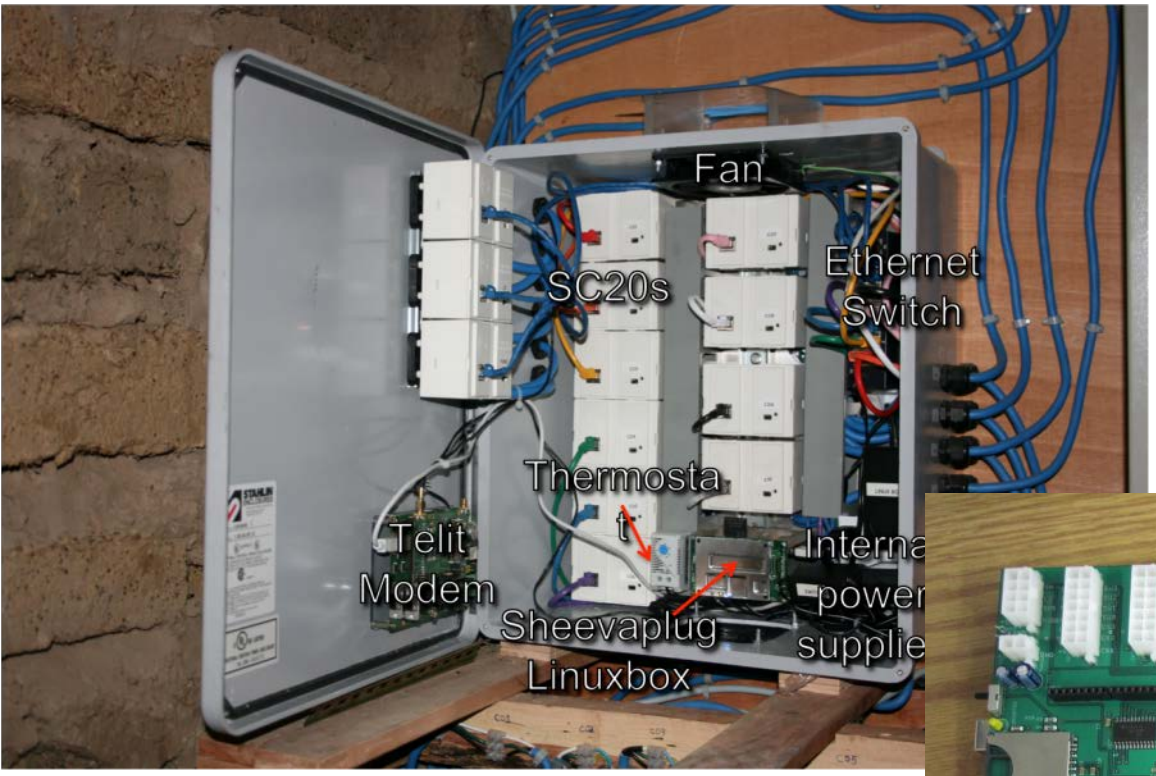
# SharedSolar

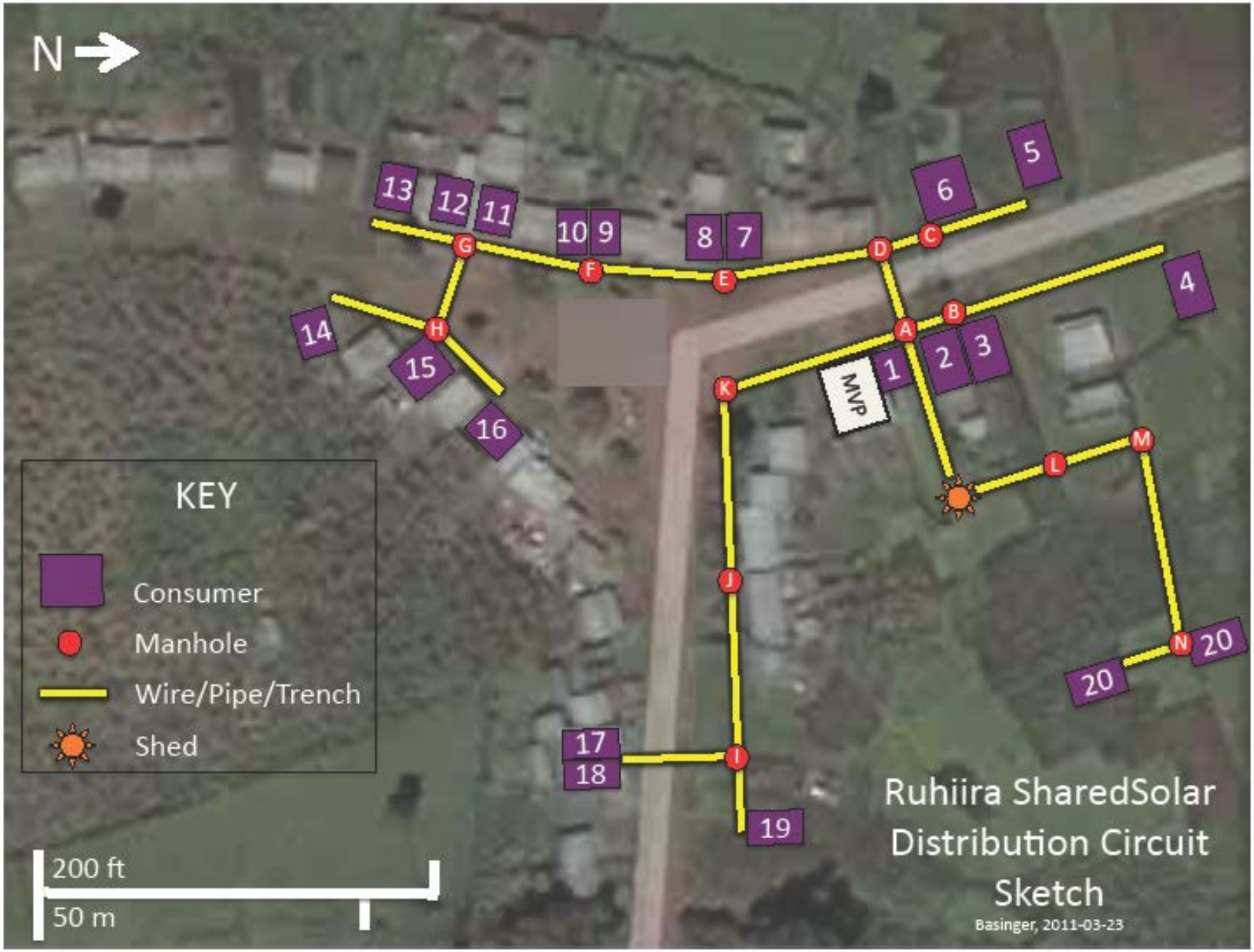

SharedSolar

# Architecture



# Meter Enclosure

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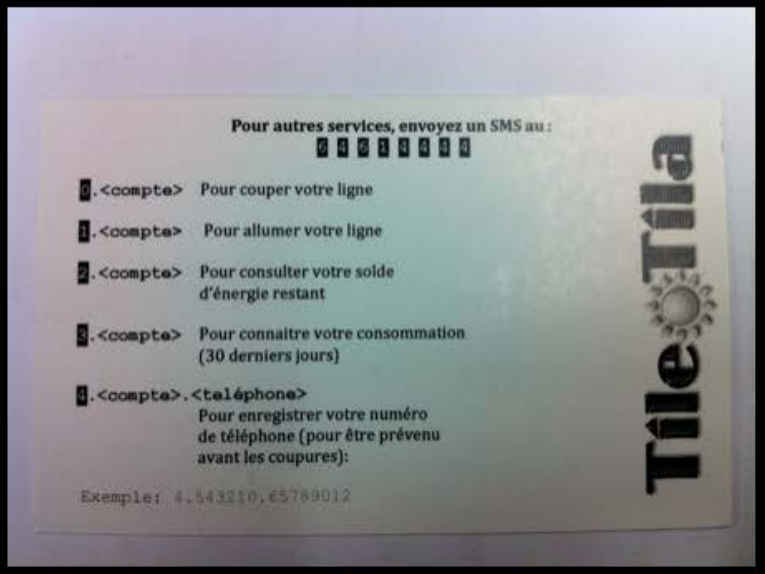
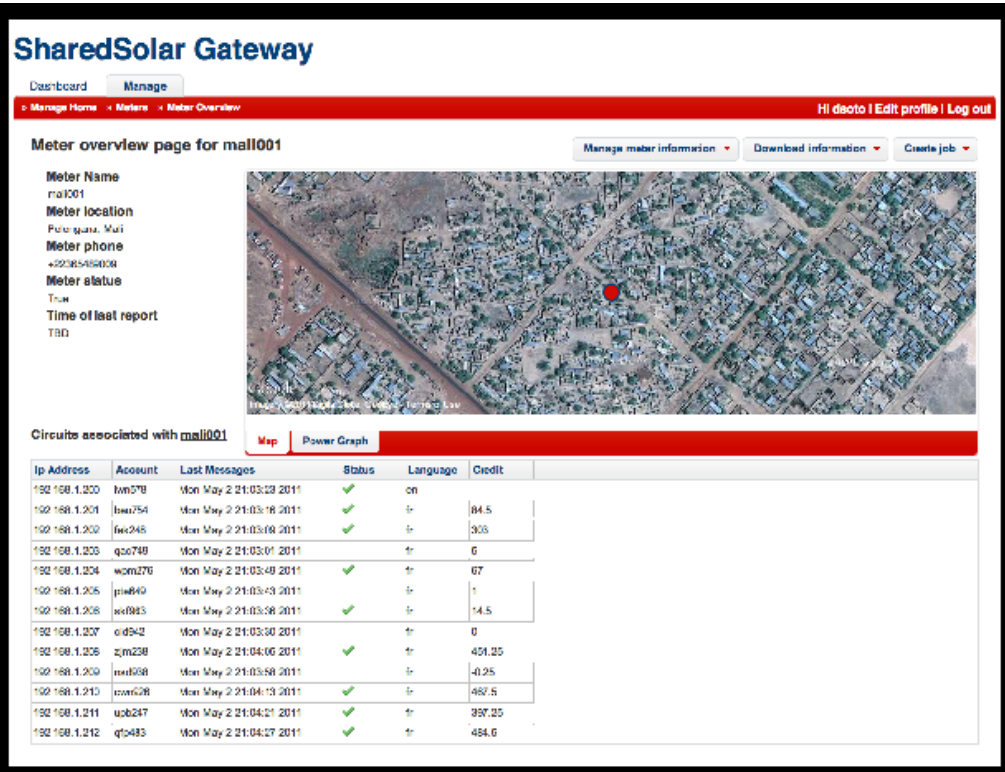
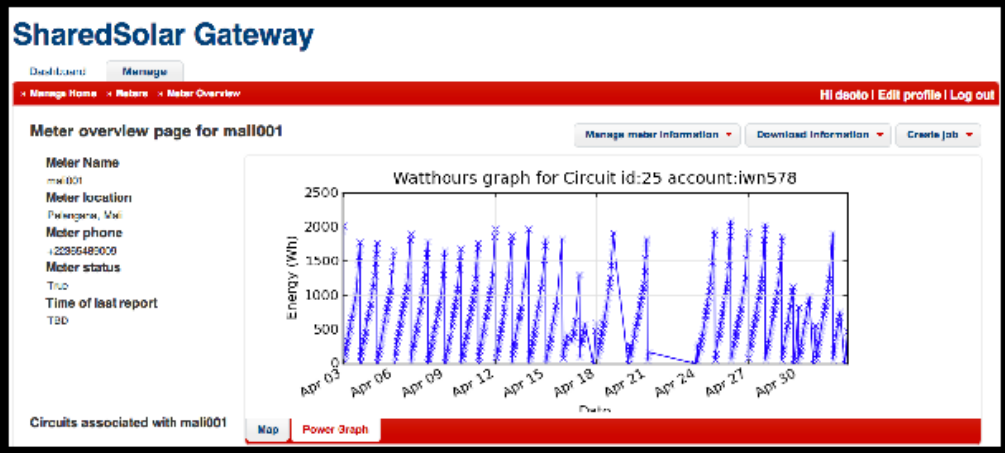
MVP
A
B
C
D
E
F
G
H
I
J
K
L
M
N
KEY
Consumer
Manhole
Wire/Pipe/Trench
Shed
200 ft
50 m
Ruhiira SharedSolar
Distribution Circuit
Sketch
Basinger, 2011-03-23

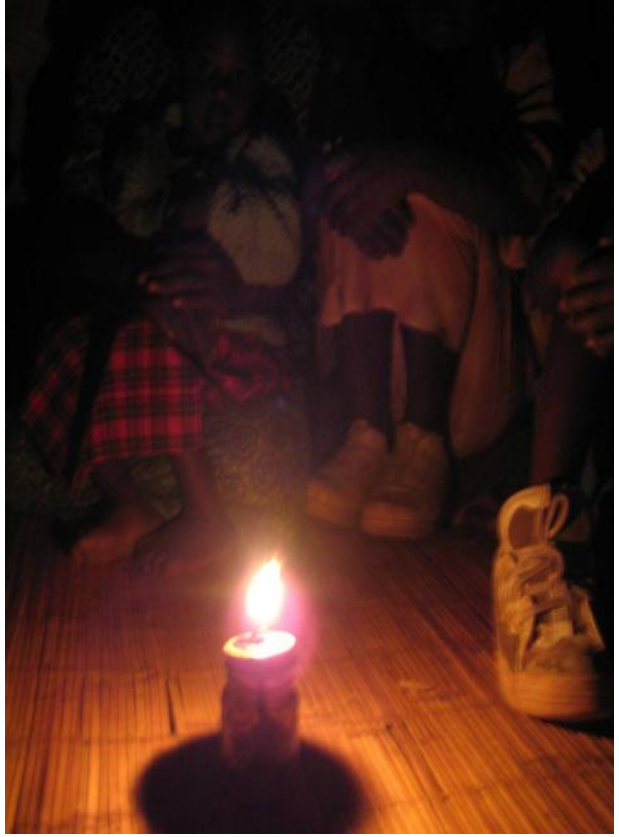
# Scratch Cards for Energy Purchase



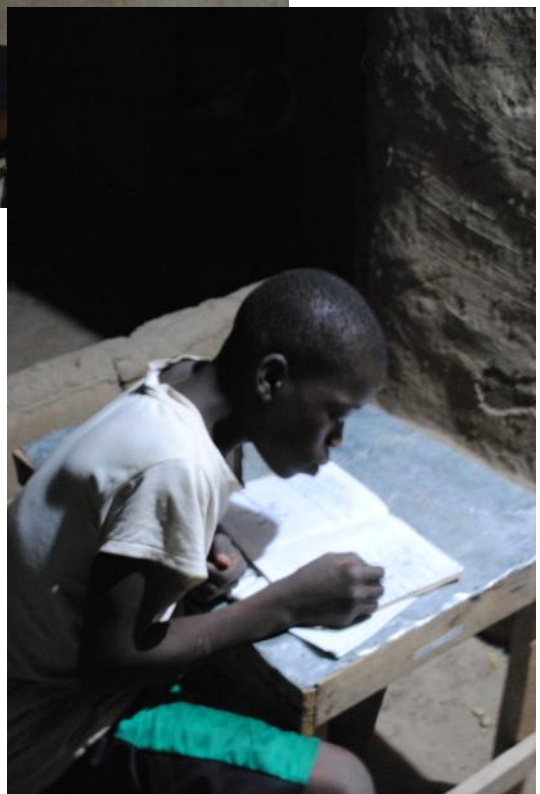

# Web Interface






300W AC Inverter



# Where are we deploying pilots of Shared Solar?

- Mali  (functioning since two months)
- Strong government interest in Mali
- Uganda (functioning since two weeks)
- Next: Tanzania