Keynote Address presented at the AfricaGIS 2017 Conference
United Nations Economic Commission for Africa, Addis Ababa, Ethiopia
Tuesday, 21st November 2017

Geo-information:

A Key Pillar for Modern-day Decision Makers

Presented By:

H.E. Hon. Dr. Wilber Ottichilo, CBS
Governor Vihiga County
Kenya

&

Erick Khamala
Managing Director, LocateIT Ltd
Kenya

PRESENTATION OUTLINE

- Introduction
- Trends and Opportunities in EO, GIS and allied Geo-ICTs
- Talking Development: Examples of role played by GI Technologies in planning and decision making:
  - Africa
  - Emuhaya Constituency, Kenya
  - Vihiga County, Kenya
- Conclusion

INTRODUCTION: MODERN-DAY DECISION MAKER

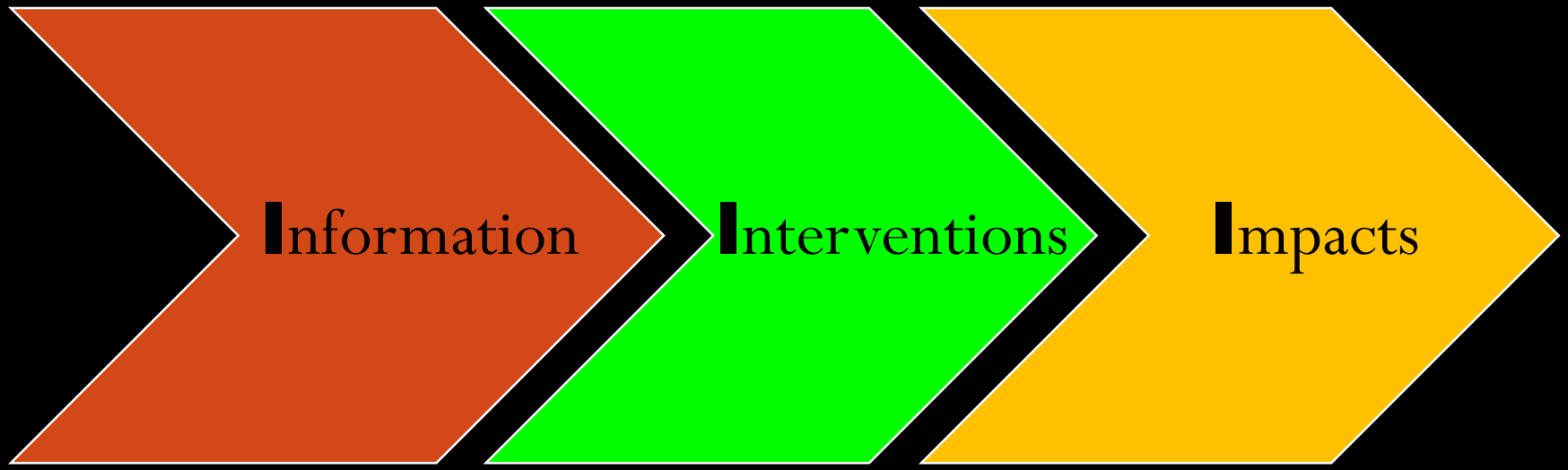
Geospatial technologies (EO, Navigation & Positioning, and Communication), **and allied ICT technologies**

Information for Planning, Policy and Decision Support

Transformative Interventions

Societal Impacts

The 3is Framework™

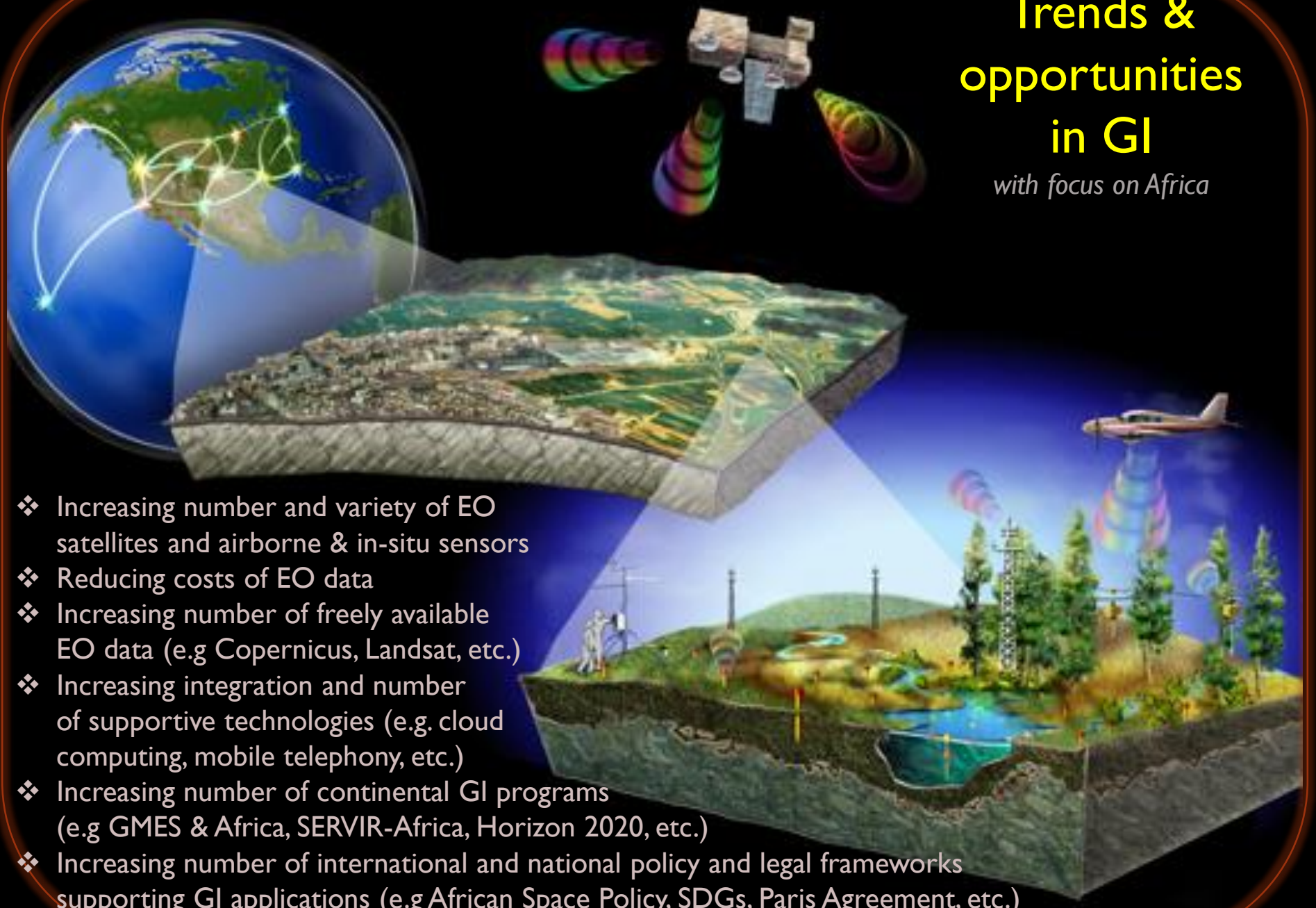


TRENDS AND OPPORTUNITIES

In Earth Observation, GIS and allied Geo-ICTs

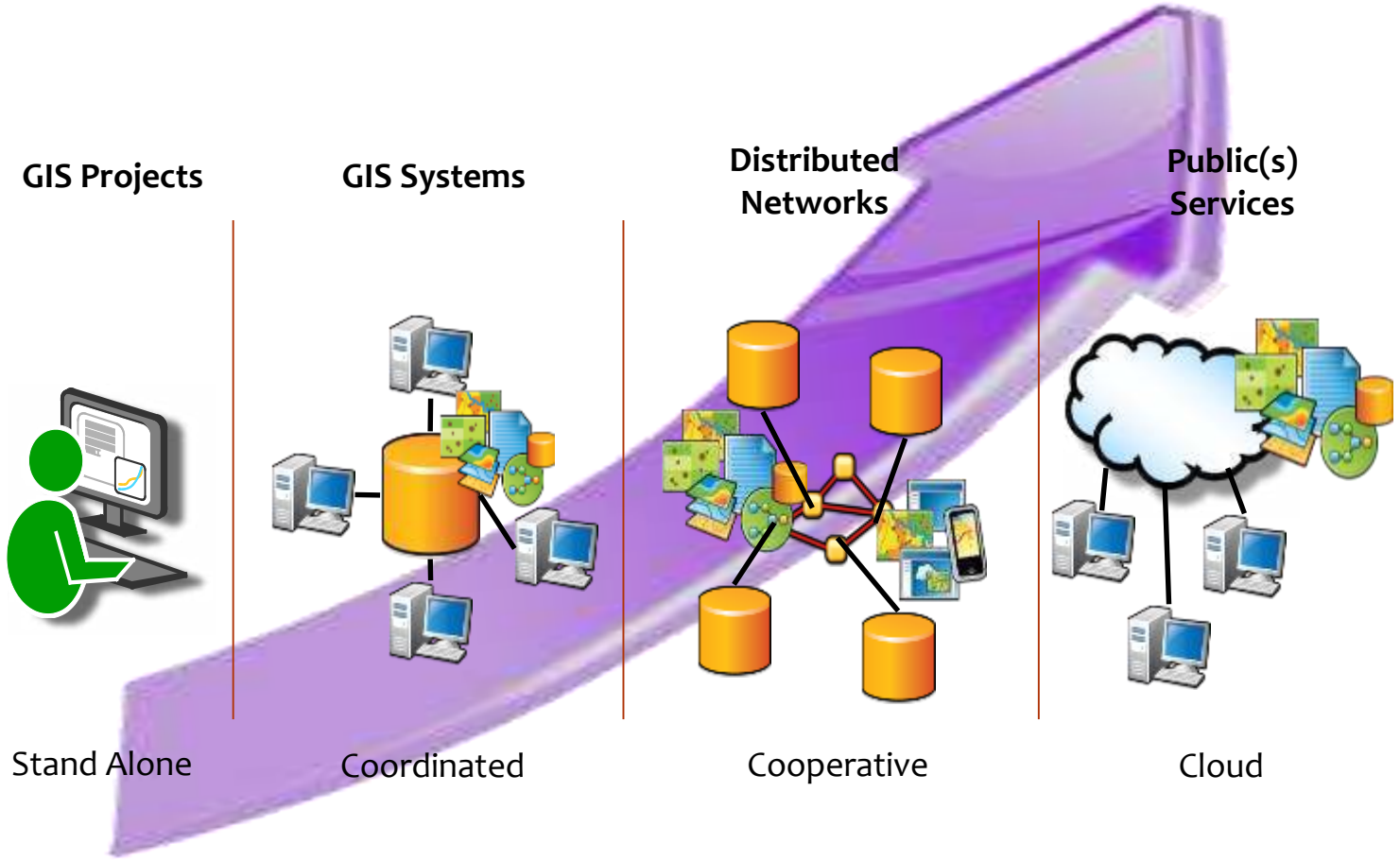
Trends & opportunities in GI

with focus on Africa



- Increasing number and variety of EO satellites and airborne & in-situ sensors
- Reducing costs of EO data
- Increasing number of freely available EO data (e.g Copernicus, Landsat, etc.)
- Increasing integration and number of supportive technologies (e.g. cloud computing, mobile telephony, etc.)
- Increasing number of continental GI programs (e.g GMES & Africa, SERVIR-Africa, Horizon 2020, etc.)
- Increasing number of international and national policy and legal frameworks supporting GI applications (e.g African Space Policy, SDGs, Paris Agreement, etc.)
- Emerging GI application areas (e.g crop and livestock insurance, Internet of Things, etc.)

Technology advances over the years made it technically possible for more people and organizations to be connected…….



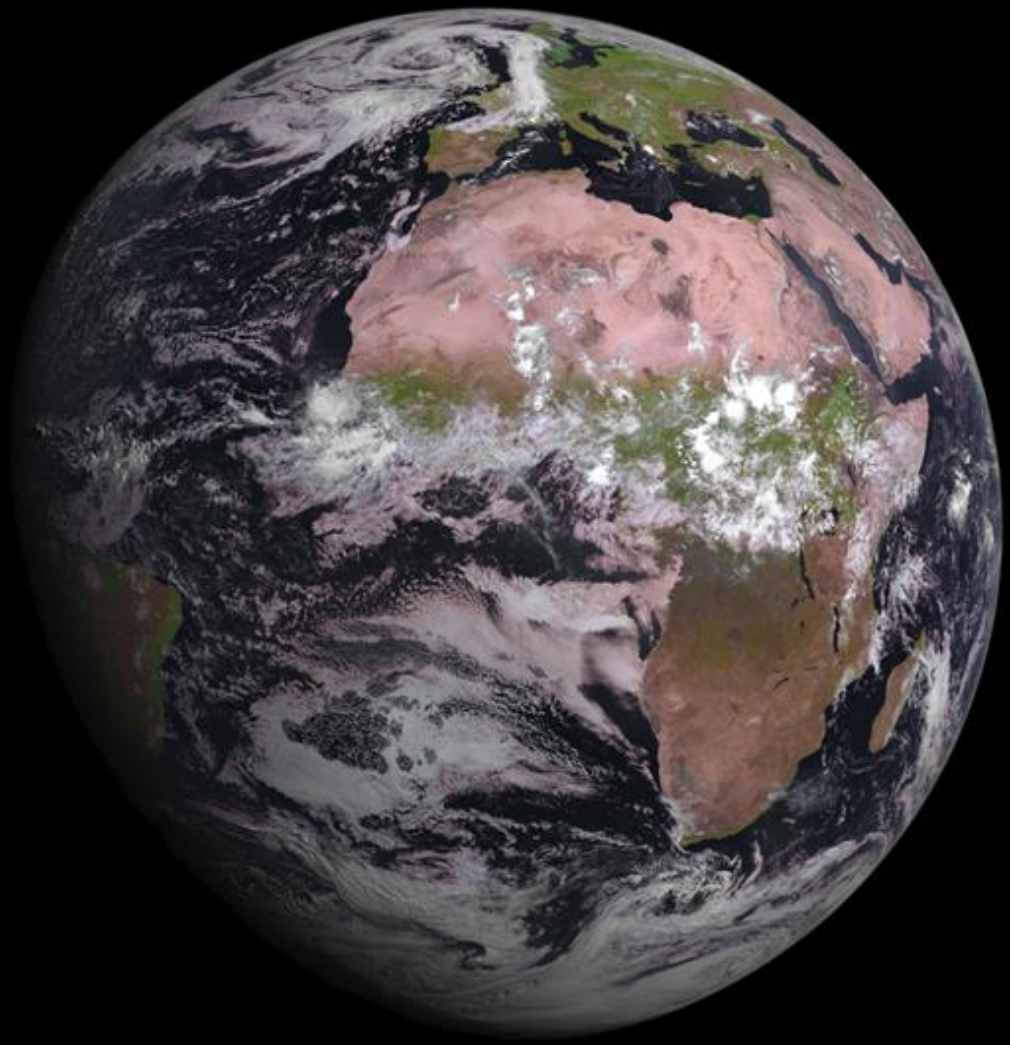
…. Allowing a myriad of applications in all sectors

Smartphones have GPS gadgets

TALKING DEVELOPMENT

Examples of role played by Geo-information Technologies in planning & decision making

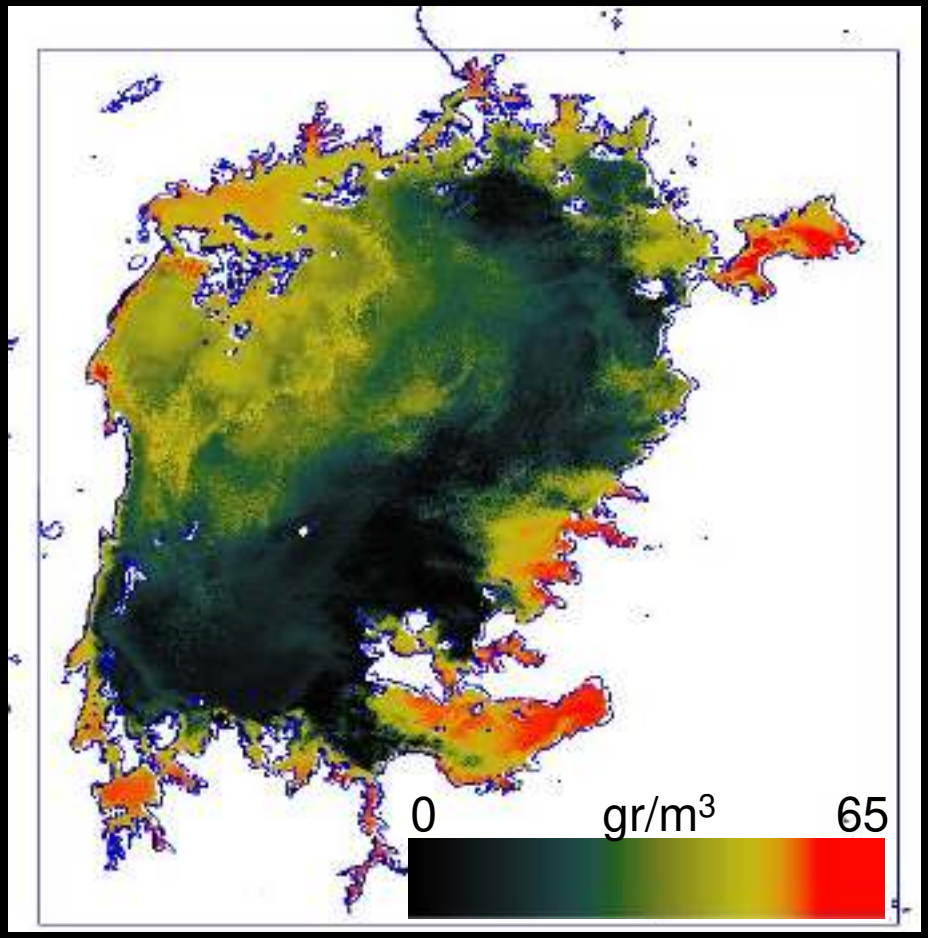
- *In Africa*
- *In Emuhaya Constituency*
- *In Vihiga County*



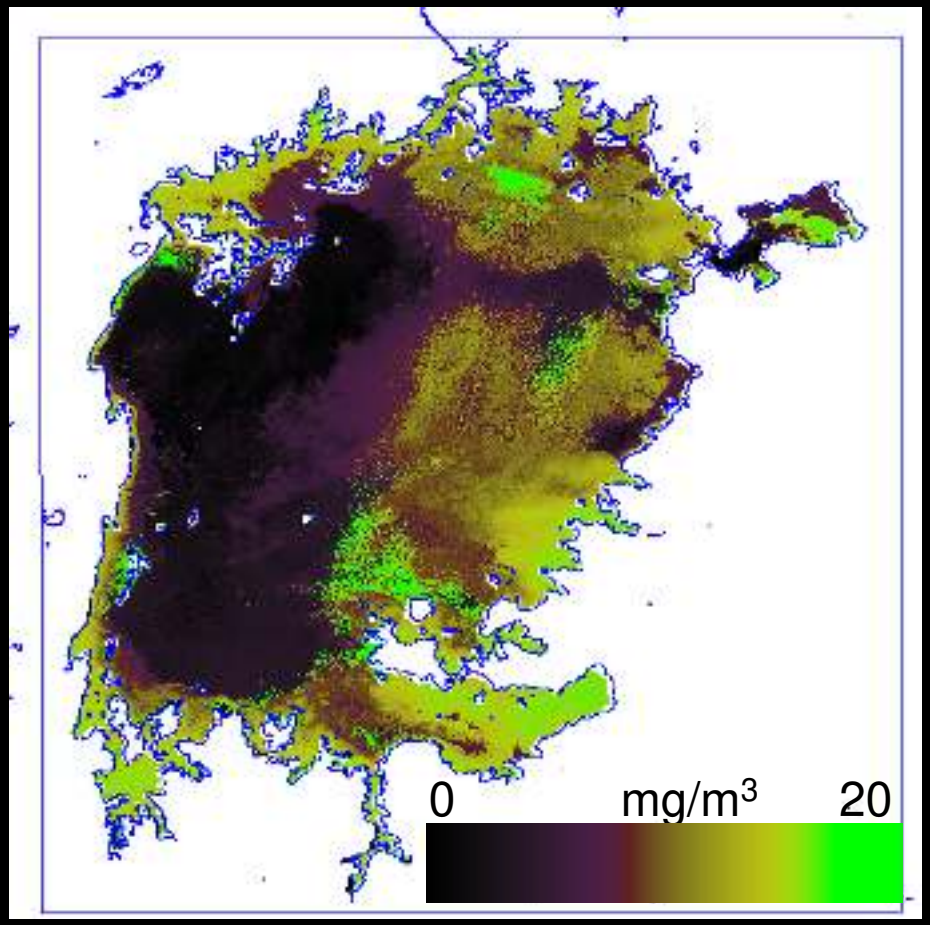
MSG 4 SEVIRI First Image
4th August 2015 10:00 UTC

In 2014, the Lake Turkana Wind Power Project, the largest renewable energy project in Sub-Saharan Africa was launched in northern Kenya and today has 365 turbines installed at **Loiyangalani in Marsabit, Kenya**

Mapping Suspended Matter, Chlorophyll and Yellow Matter from Space

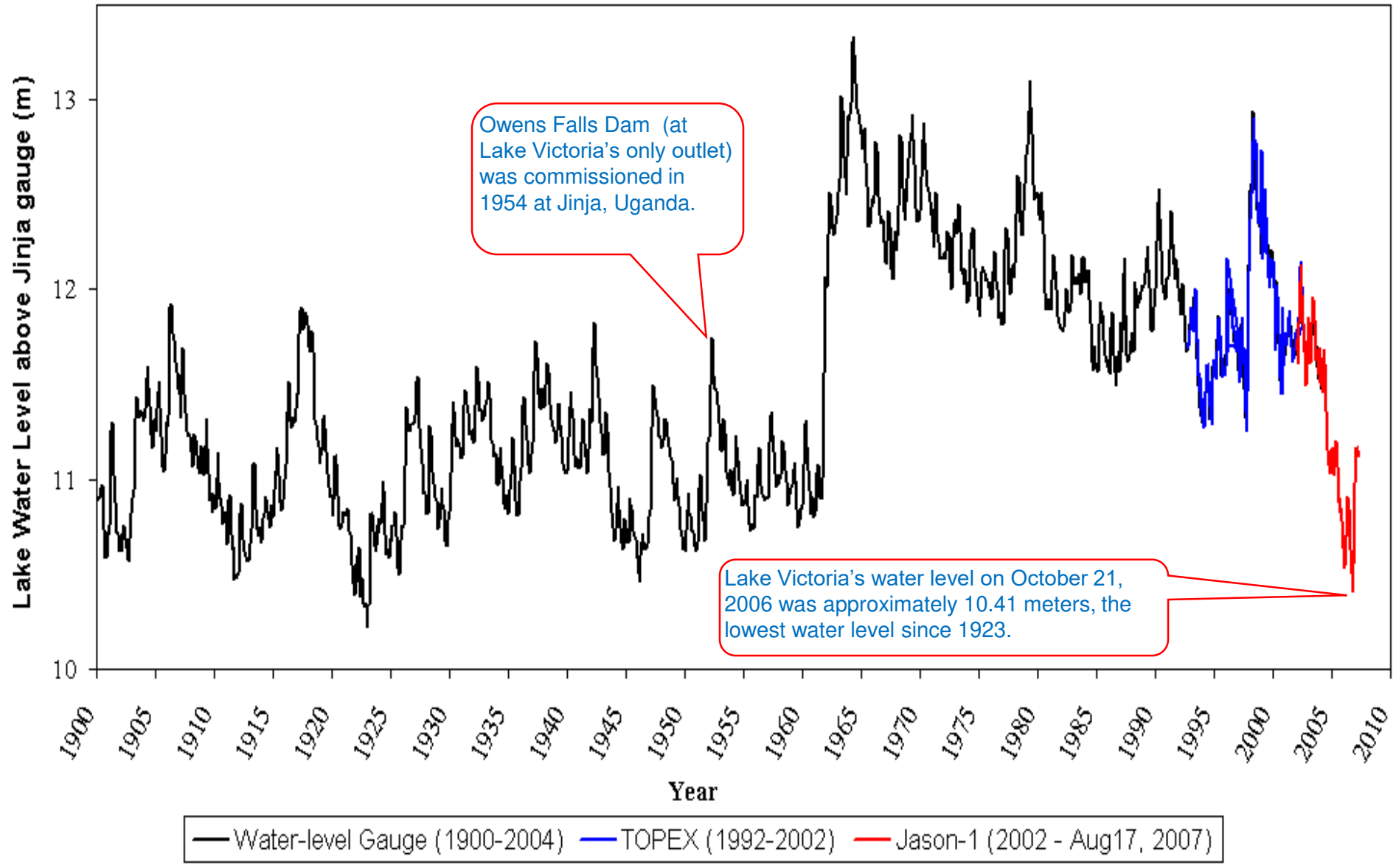


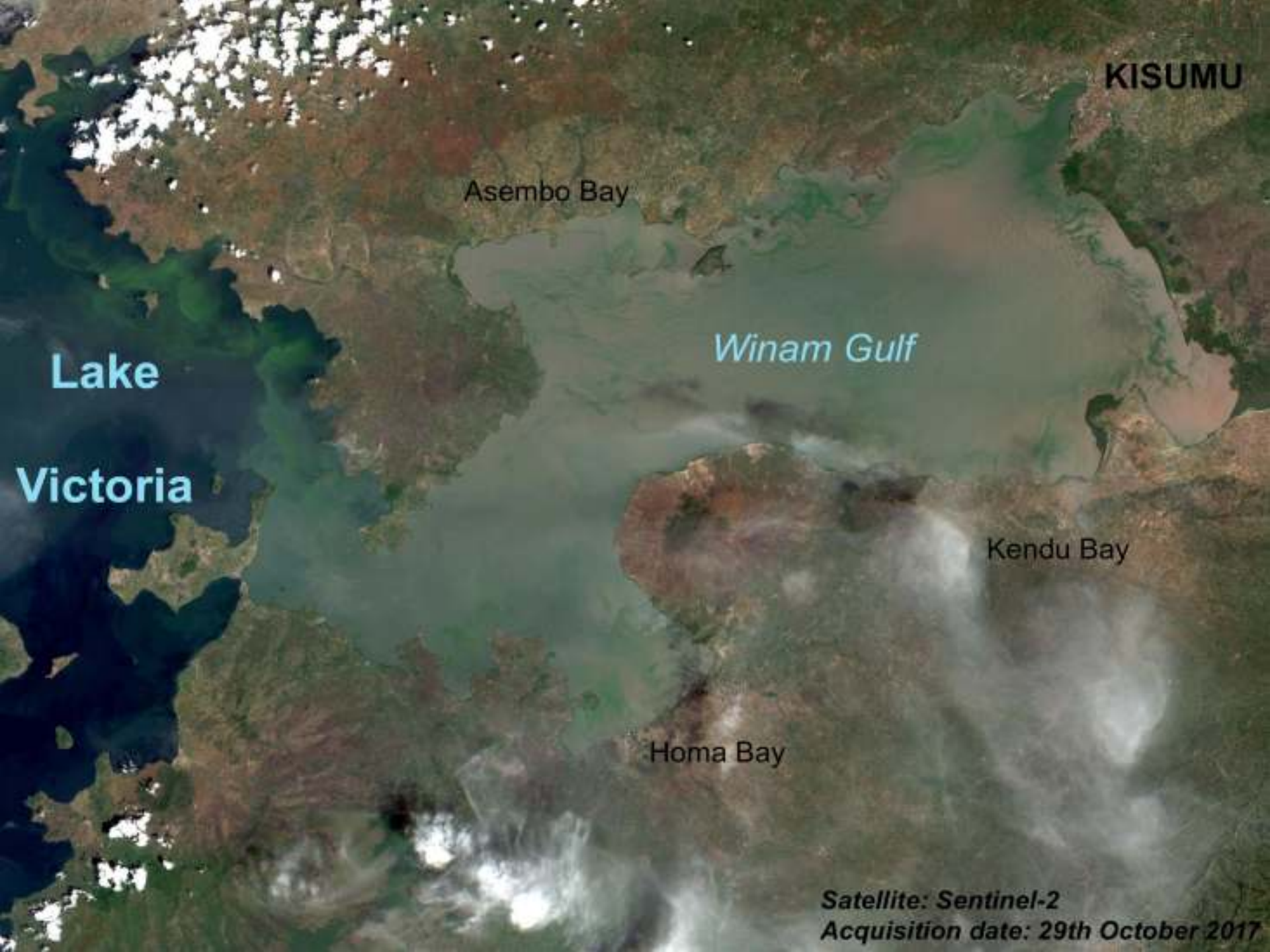
Total suspended matter derived
from Envisat-MERIS Sensor



Total Chlorophyll derived
from Envisat-MERIS Sensor

Lake level fluctuation monitoring from Satellite




KISUMU
Asembo Bay
Winam Gulf
Lake
Victoria
Kendu Bay
Homa Bay
Satellite: Sentinel-2
Acquisition date: 29th October 2017

The Devolved System of Governance in Kenya

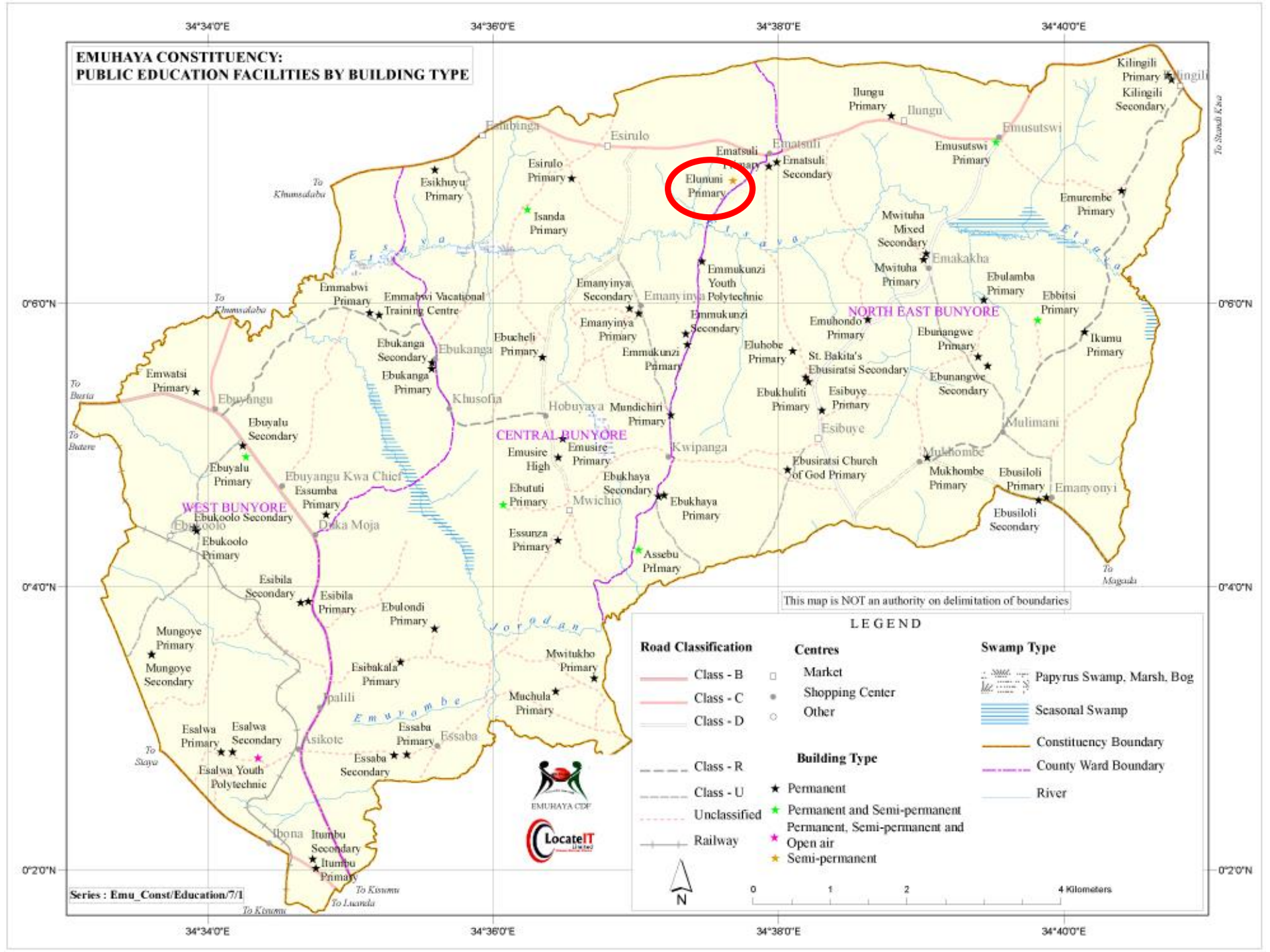
- Constitution provides for devolved Government system
- New Government system ushered on March 4th 2013:
  - National Government
  - 47 County Governments
- Parliamentary system at national level comprising:
  - The National Assembly (349 Members of Parliament)
  - The Senate (67 Members of Senate)
- County Governments comprise:
  - The Executive (Governor & ministers)
  - The County Assembly / Parliament (elected ward representatives)
- Constituency Development Fund (CDF): a fund that supports development at constituency level
- County Government Budget for recurrent expenditures and county development

Note: Counties in Kenya comprise between 2 – 17 Constituencies

Emuhaya Constituency

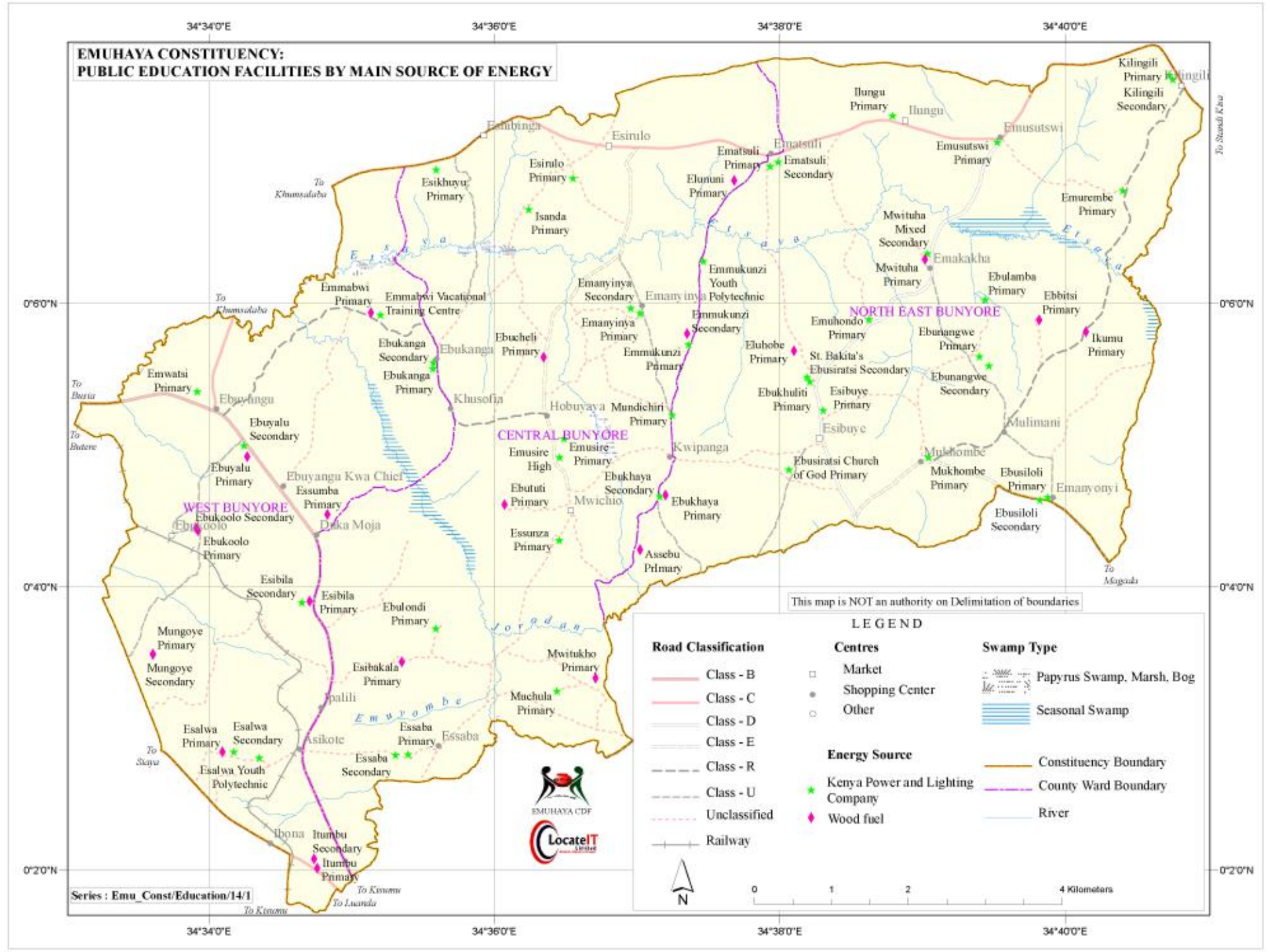
Pleiades image, 3rd Feb. 2016

Examples from the Education Sector


EMUHAYA CONSTITUENCY:
PUBLIC EDUCATION FACILITIES BY BUILDING TYPE
34°34'0"E
34°36'0"E
34°38'0"E
34°40'0"E
0°6'0"N
0°4'0"N
0°2'0"N
Esibinga
Esirulo
Ematsuli
Ematsuli Primary
Ematsuli Secondary
Ilungu Primary
Ilungu
Emusutswi
Emusutswi Primary
Kilingili Primary
Kilingili Secondary
Kilingili
To Standi Kisa
Esikhuyu Primary
Esirulo Primary
Elununi Primary
Isanda Primary
Emurembe Primary
To Khumsalaba
Mwituha Mixed Secondary
Mwituha Primary
Emakakha
Ebulamba Primary
Ebbitsi Primary
Emmabwi Primary
Emmabwi Vacational Training Centre
Emanyinya Secondary
Emanyinya
Emmukunzi Youth Polytechnic
Emmukunzi Secondary
Emanyinya Primary
Emmukunzi Primary
NORTH EAST BUNYORE
Emuhondo Primary
Ebunangwe Primary
Ikumu Primary
Ebukanga Secondary
Ebukanga
Ebucheli Primary
Eluhobe Primary
St. Bakita's Ebusiratsi Secondary
Ebunangwe Secondary
Ebukanga Primary
Khusofia
Hobuyaya
Mundichiri Primary
Ebukhuliti Primary
Esibuye Primary
Esibuye
Mulimani
To Busia
Emwatsi Primary
Ebuyangu
Ebuyalu Secondary
To Butere
CENTRAL BUNYORE
Emusire High
Emusire Primary
Kwipanga
Ebusiratsi Church of God Primary
Mukhombe
Mukhombe Primary
Ebusiloli Primary
Emanyonyi
Ebusiloli Secondary
Ebuyalu Primary
Ebuyangu Kwa Chief
Essumba Primary
Ebukhaya Secondary
Ebututi Primary
Mwichio
Ebukhaya Primary
WEST BUNYORE
Ebukoolo Secondary
Ebukoolo
Duka Moja
Ebukoolo Primary
Essunza Primary
Assebu PrImary
To Magada
Esibila Secondary
Esibila Primary
Ebulondi Primary
This map is NOT an authority on delimitation of boundaries
Mungoye Primary
Mungoye Secondary
Esibakala Primary
Mwitukho Primary
Muchula Primary
Ipalili
Esalwa Primary
Esalwa Secondary
Asikote
Essaba Primary
Essaba
Essaba Secondary
To Siaya
Esalwa Youth Polytechnic
Ibona
Itumbu Secondary
Itumbu Primary
To Kisumu
To Luanda
To Kisumu
Series : Emu_Const/Education/7/1
EMUHAYA CDF
LocateIT
LEGEND
Road Classification
Class - B
Class - C
Class - D
Class - R
Class - U
Unclassified
Railway
Centres
Market
Shopping Center
Other
Building Type
Permanent
Permanent and Semi-permanent
Permanent, Semi-permanent and Open air
Semi-permanent
Swamp Type
Papyrus Swamp, Marsh, Bog
Seasonal Swamp
Constituency Boundary
County Ward Boundary
River
N
0
1
2
4 Kilometers

New Education Infrastructural Projects: ***Ebunangwe High School***

Status of Electricity in Public Education Facilities


EMUHAYA CONSTITUENCY:
PUBLIC EDUCATION FACILITIES BY MAIN SOURCE OF ENERGY
34°34'0"E
34°36'0"E
34°38'0"E
34°40'0"E
0°6'0"N
0°4'0"N
0°2'0"N
Esimbinga
Esirulo
Ilungu
Ilungu Primary
Emusutswi
Emusutswi Primary
Kilingili Primary
Kilingili Secondary
Kilingili
Ematsuli
Ematsuli Primary
Ematsuli Secondary
Elununi Primary
Esirulo Primary
Esikhuyu Primary
Isanda Primary
To Khumsalaba
To Stanali Kisa
Emurembe Primary
Mwituha Mixed Secondary
Emakakha
Mwituha Primary
Ebulamba Primary
Ebbitsi Primary
Ikumu Primary
Emmukunzi Youth Polytechnic
Emanyinya Secondary
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Hobuyaya
Mundichiri Primary
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NORTH EAST BUNYORE
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Ebuyalu Secondary
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WEST BUNYORE
Ebukoolo Secondary
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Ebukoolo Primary
Esibila Secondary
Esibila Primary
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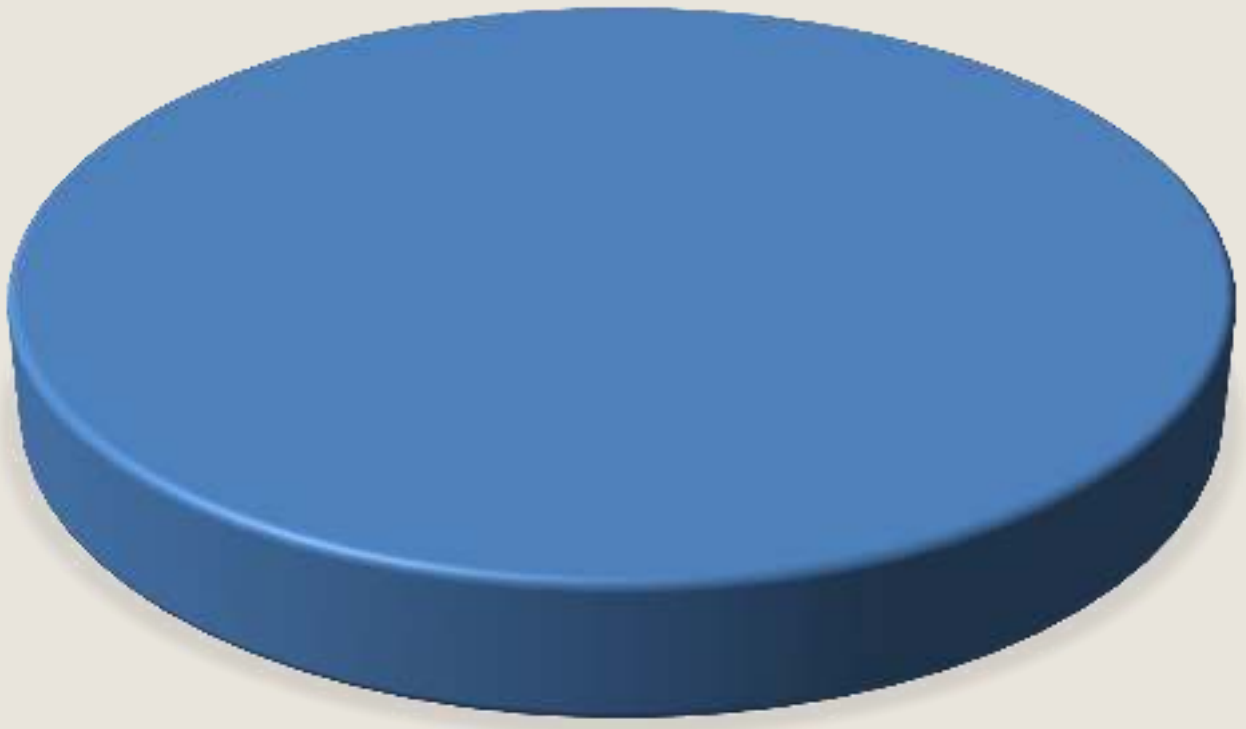
Mungoye Primary
Mungoye Secondary
Esibakala Primary
Mwitukho Primary
Muchula Primary
Ipalili
Esalwa Primary
Esalwa Secondary
Esalwa Youth Polytechnic
Asikote
Essaba Primary
Essaba
Essaba Secondary
Ibona
Itumbu Secondary
Itumbu Primary
To Busia
To Butere
To Siaya
To Kisumu
To Luanda
To Magada
Etsava
Jorodan
Emurombe
This map is NOT an authority on Delimitation of boundaries
LEGEND
Road Classification
Class - B
Class - C
Class - D
Class - E
Class - R
Class - U
Unclassified
Railway
Centres
Market
Shopping Center
Other
Energy Source
Kenya Power and Lighting Company
Wood fuel
Swamp Type
Papyrus Swamp, Marsh, Bog
Seasonal Swamp
Constituency Boundary
County Ward Boundary
River
N
0
1
2
4 Kilometers
EMUHAYA CDF
LocateIT Limited
Series : Emu_Const/Education/14/1

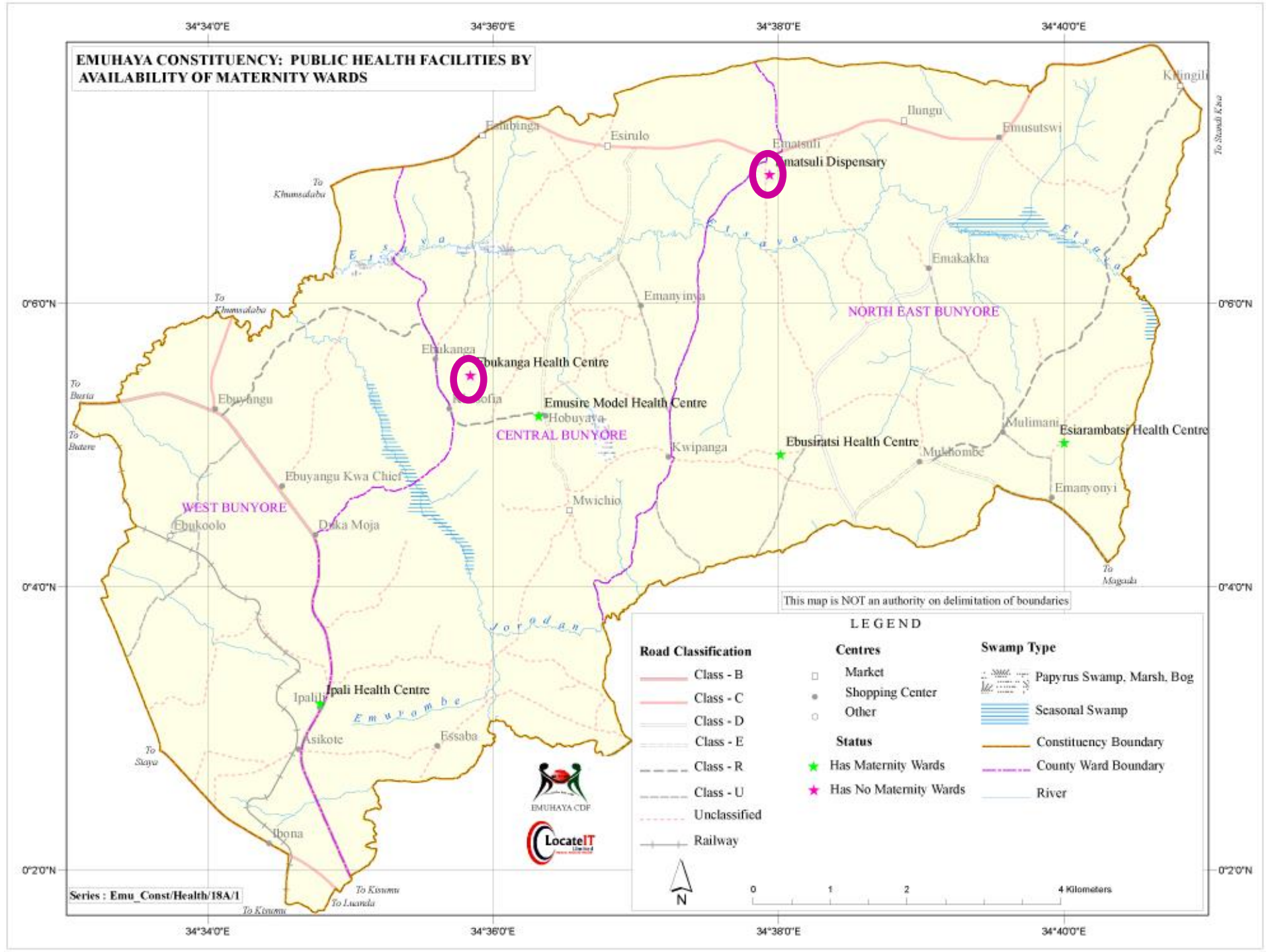
Status of electricity connectivity in Education Facilities in Emuhaya Constituency in **August 2015**

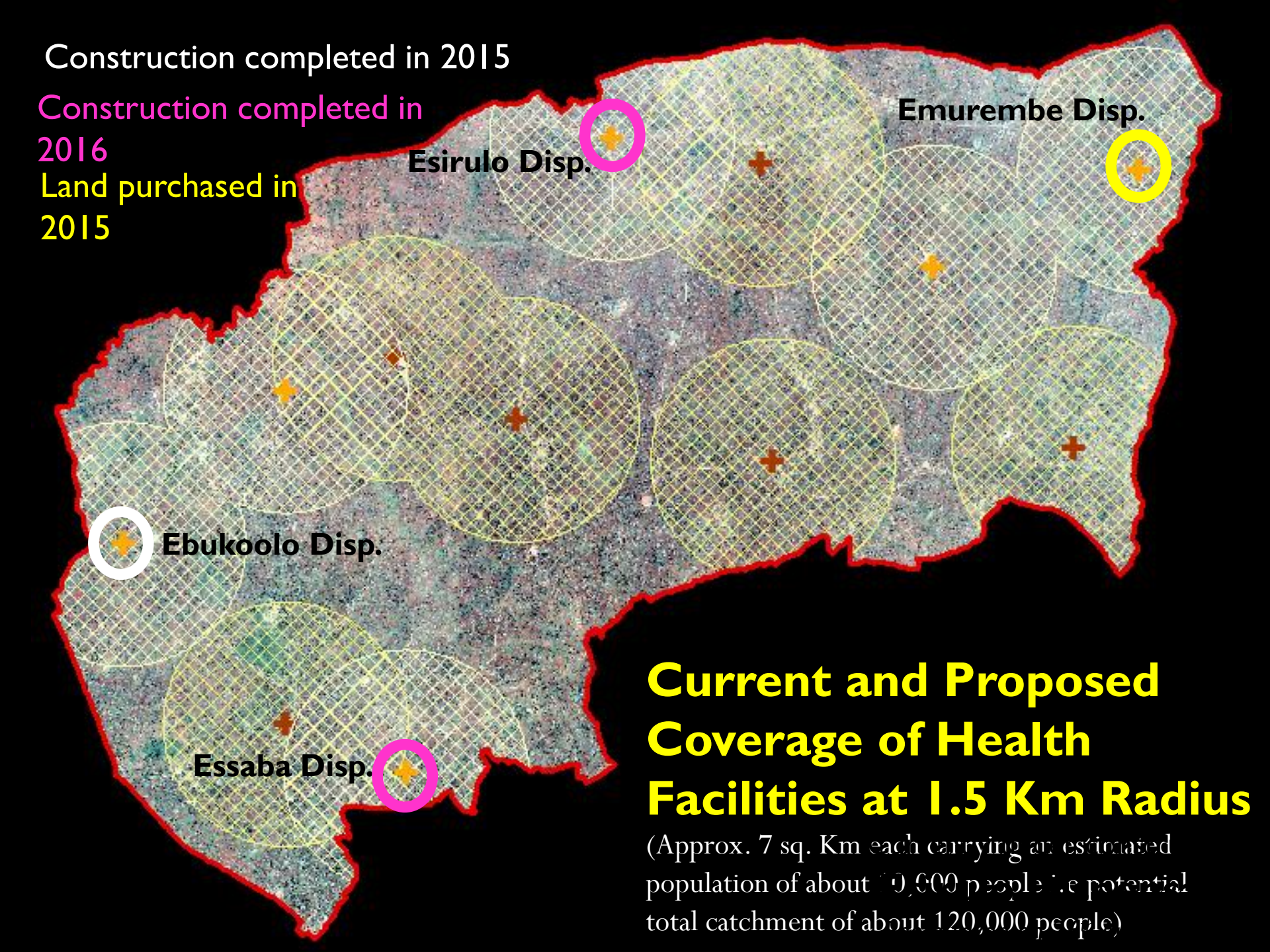


Accessing school

Ebucheli Primary School

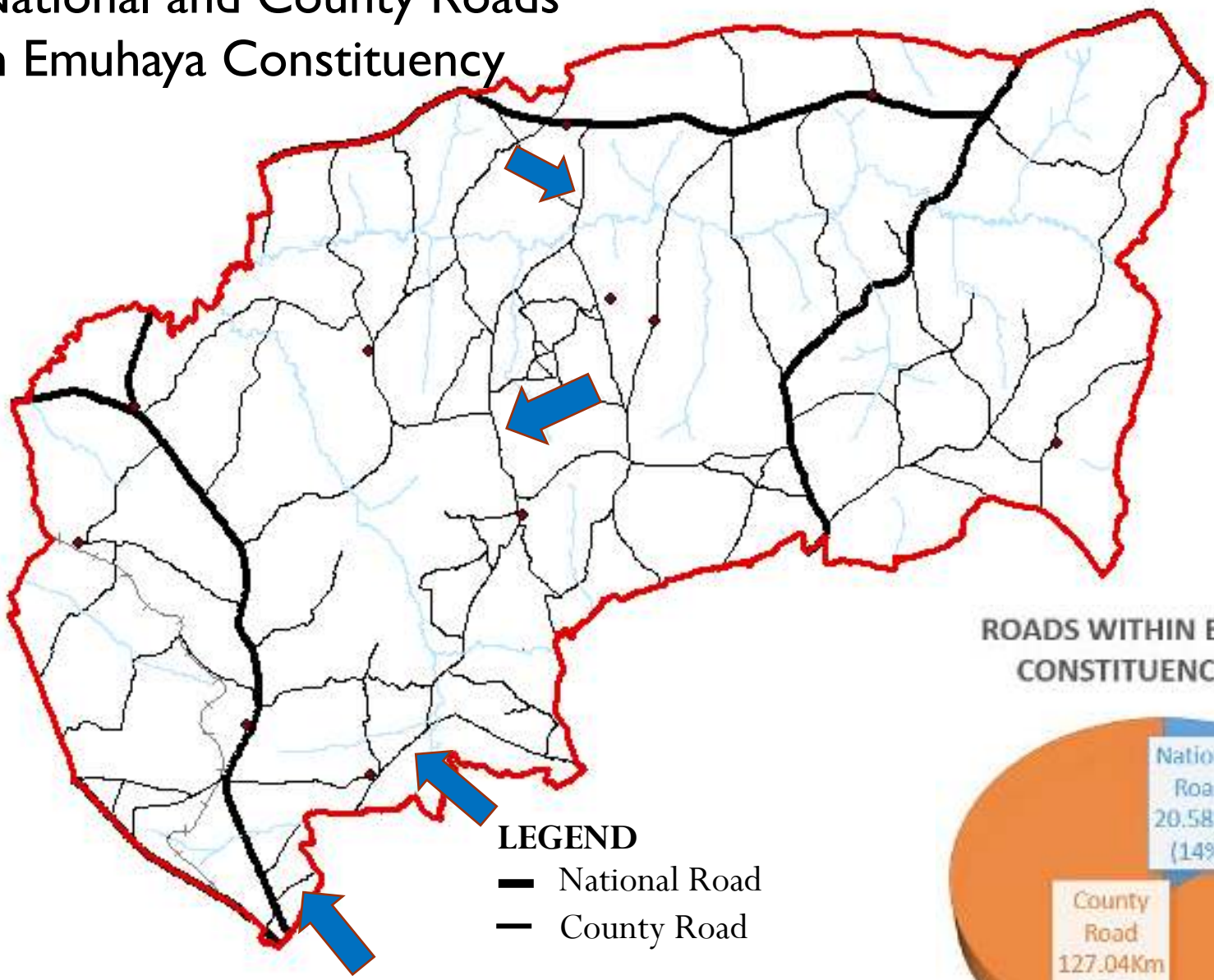
Examples from the Health Sector

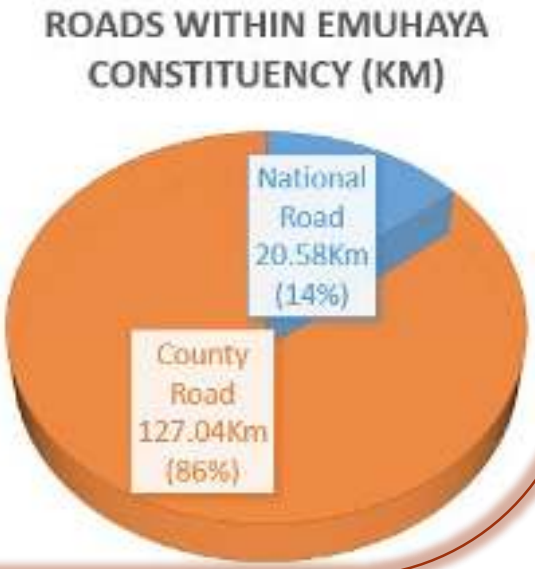

EMUHAYA CONSTITUENCY: PUBLIC HEALTH FACILITIES BY AVAILABILITY OF MATERNITY WARDS
34°34'0"E
34°36'0"E
34°38'0"E
34°40'0"E
0°6'0"N
0°4'0"N
0°2'0"N
Kilingili
Ilungu
Emusutswi
Esirulo
Ematsuli
Ematsuli Dispensary
To Khumsalaba
To Khumsalaba
Emakakha
Emanyinya
NORTH EAST BUNYORE
Ebukanga
Ebukanga Health Centre
To Busia
Ebuyangu
Emusire Model Health Centre
Hobuyaya
CENTRAL BUNYORE
To Butere
Kwipanga
Ebusiratsi Health Centre
Mulimani
Esiarambatsi Health Centre
Ebuyangu Kwa Chief
Mwichio
Emanyonyi
WEST BUNYORE
Ebukoolo
Duka Moja
To Magada
This map is NOT an authority on delimitation of boundaries
LEGEND
Road Classification
Class - B
Class - C
Class - D
Class - E
Class - R
Class - U
Unclassified
Railway
Centres
Market
Shopping Center
Other
Status
Has Maternity Wards
Has No Maternity Wards
Swamp Type
Papyrus Swamp, Marsh, Bog
Seasonal Swamp
Constituency Boundary
County Ward Boundary
River
Ipali Health Centre
Asikote
Essaba
To Siaya
Ibona
EMUHAYA CDF
LocateIT
N
0
1
2
4 Kilometers
Series : Emu_Const/Health/18A/1
To Kisumu
To Luanda
To Kisumu


Construction completed in 2015
Construction completed in 2016
Land purchased in 2015
Esirulo Disp.
Emurembe Disp.
Ebukoolo Disp.
Essaba Disp.
Current and Proposed Coverage of Health Facilities at 1.5 Km Radius
(Approx. 7 sq. Km each carrying an estimated population of about 10,000 people i.e potential total catchment of about 120,000 people)

ROADS

National and County Roads in Emuhaya Constituency





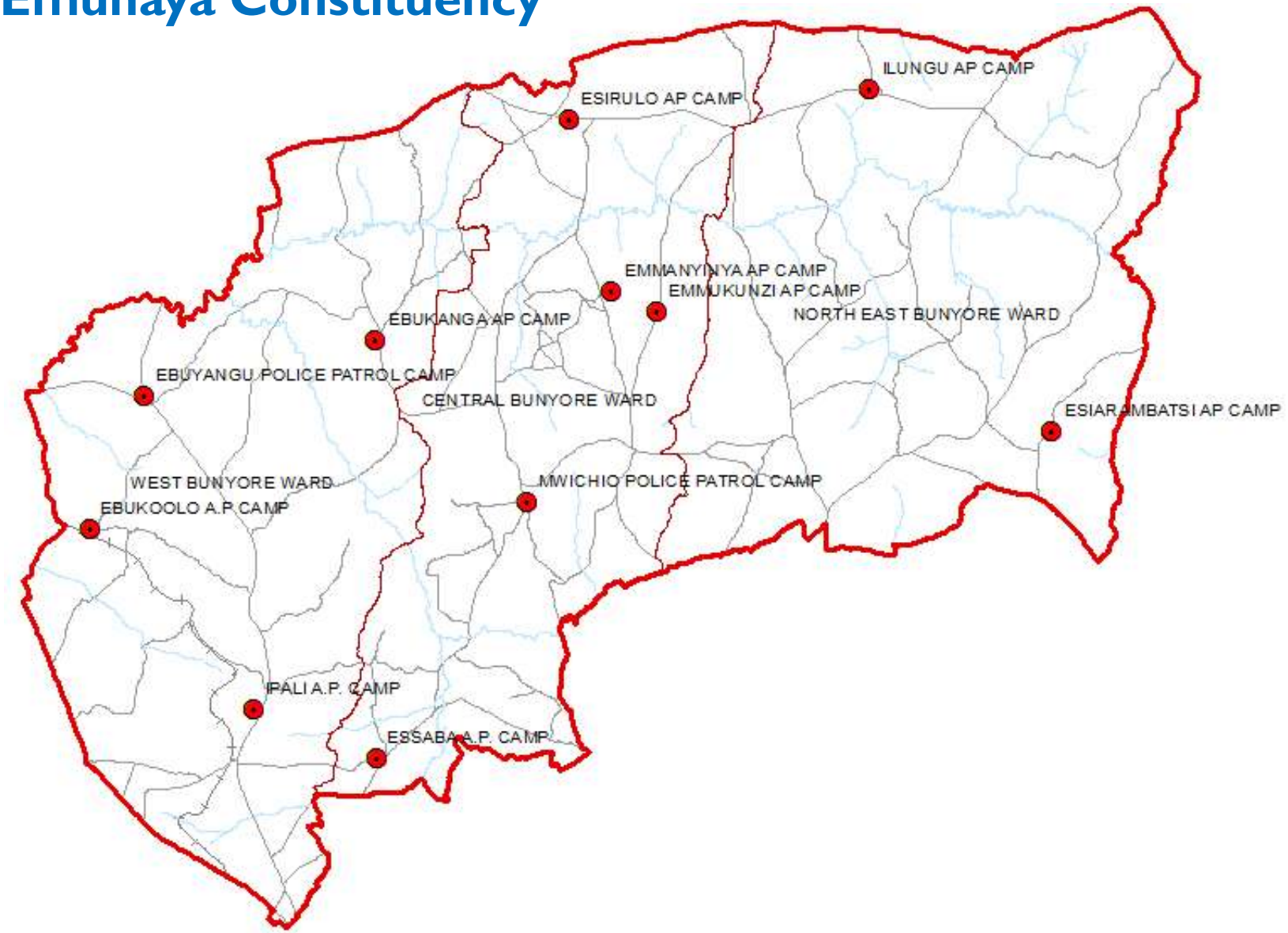
Ebukoolo Area

Esibuye Area

Ematsuli Area

Security

Police and AP Posts in Emuhaya Constituency



Dr Wilbur Ottichilo for Vihiga County Governor 2017

@WKO4VIHIGA

Write a comment...

Dr Wilbur Ottichilo for Vihiga County Governor 2017
posted 10 photos in Instagram.
22 June at 12:22 ·

The great people of Emuhondo sub-location in Ebusamia location, N.E. Bunyore Ward in Emuhaya sub-county received 1M shillings today to fund the construction of Mwituha police post from Emuhaya constituency CDF. This comes after they acquired an acre of land through CDF funding. Construction is commencing soon.

Strengthening security and instilling peace in Vihiga county is a priority for my people.

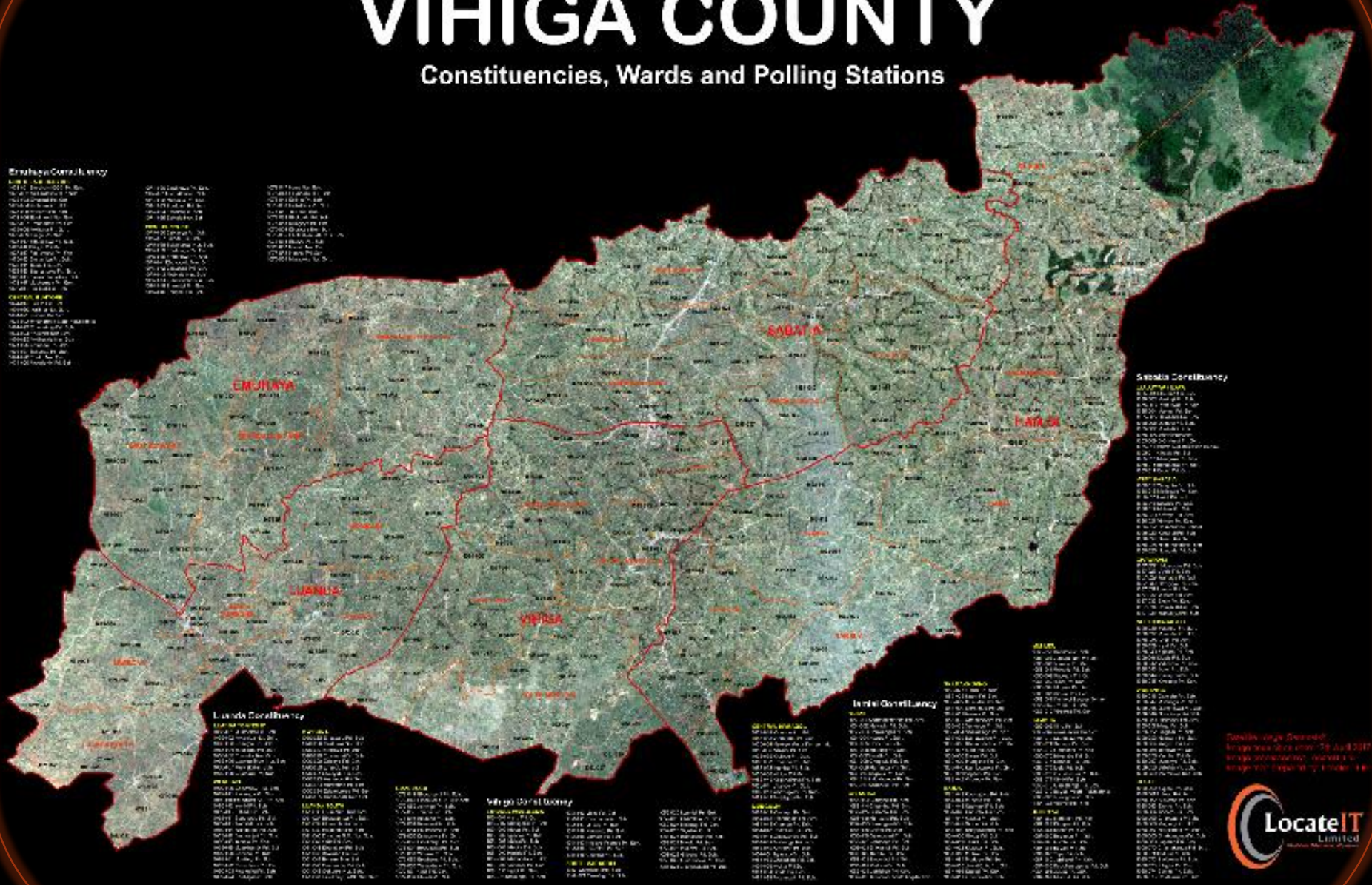
#VihigaAgenda #OttichiloTanoKwanza #MaendeleoBilaCorruption

Example of Visibility Forum:

Launch of Emuhaya Constituency GIS / ICT Centre

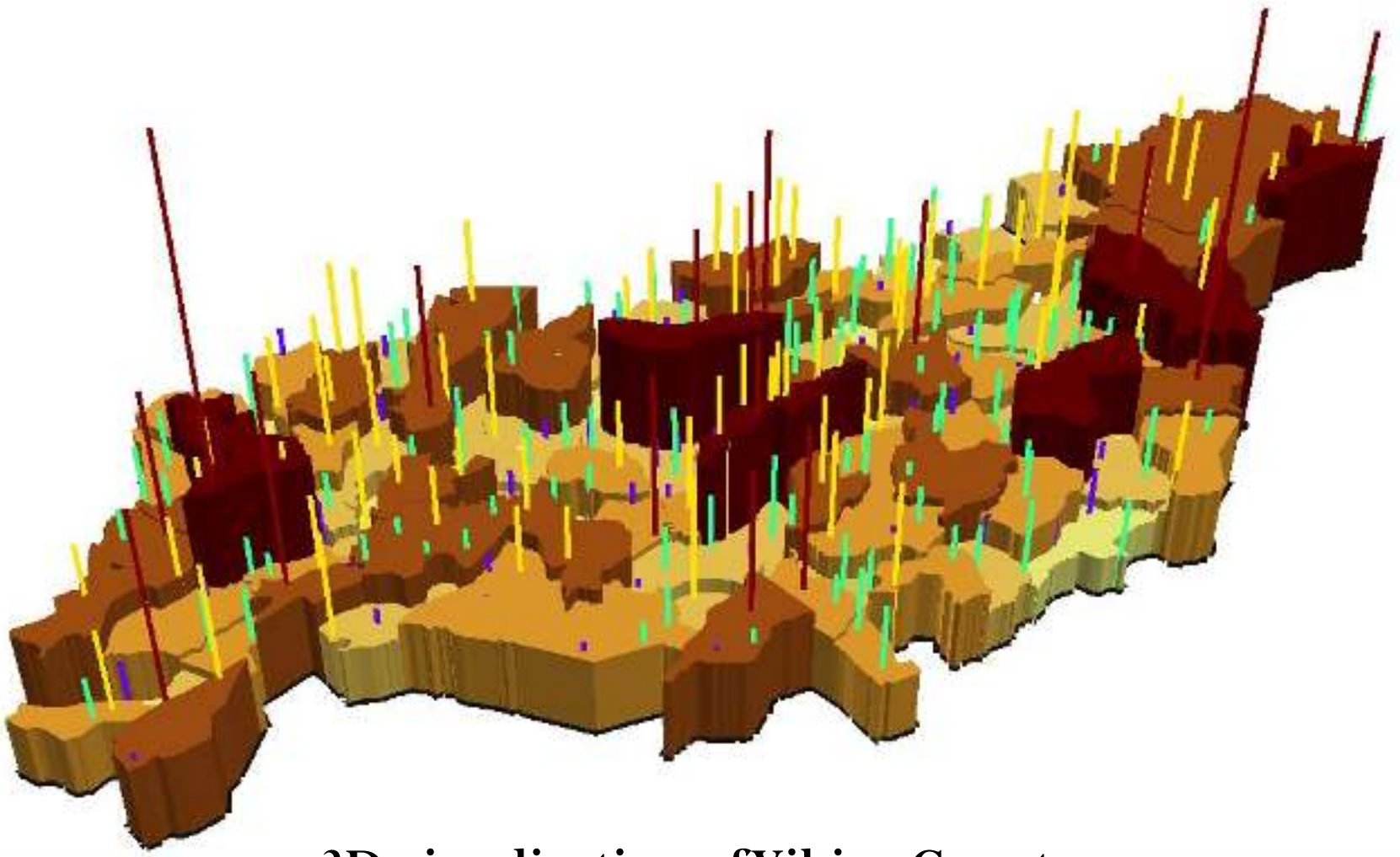
VIHIGA COUNTY

Constituencies, Wards and Polling Stations



Campaign Intelligence System (CIS)

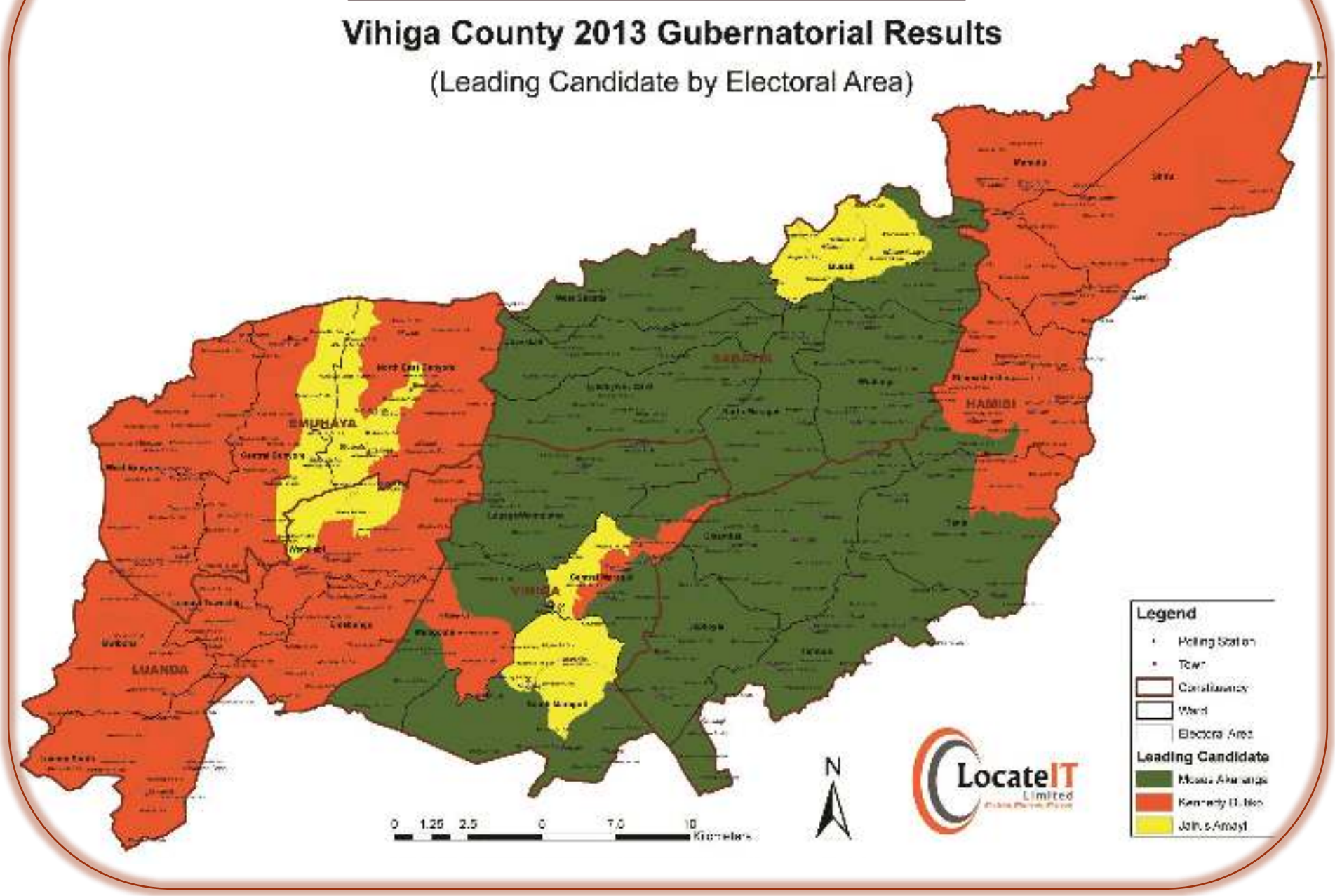
Key Voter Statistics



3D visualization of Vihiga County:

- Registered voters in 2017 at ward level (blocks)
- Registered voters in 2017 per polling station (lines)

Competition Analysis



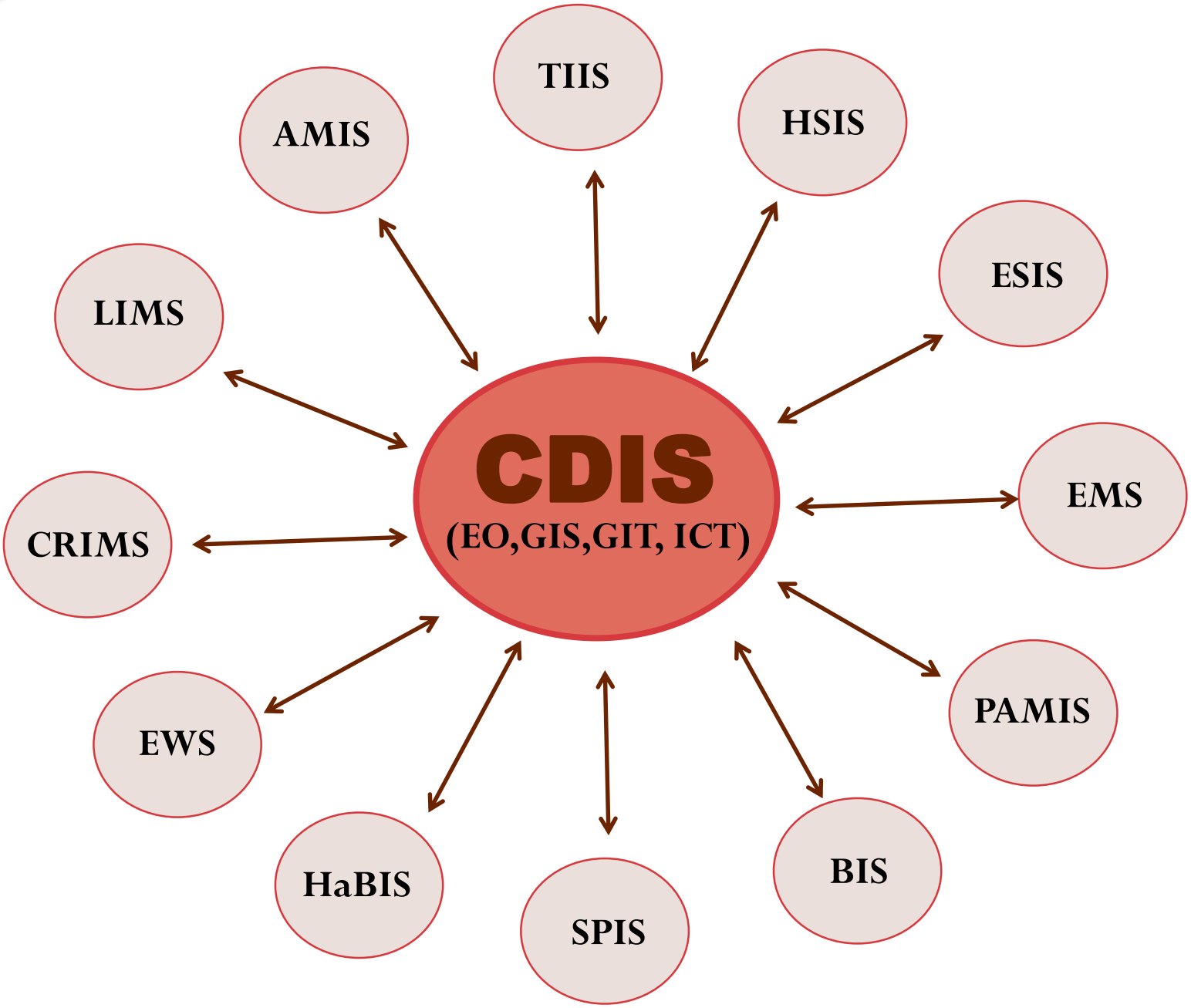
TOWARDS THE VIHIGA CDIS

- GI activities in Vihiga County are coordinated by the Department of Physical Planning, Land and Housing
- The GI activities have been conceived along the County Development Information System (CDIS) framework to effectively support the various functions defined under the Fourth Schedule on Distribution of Functions between National and County Governments. These include:
  - Health
  - Education
  - Infrastructure and transport
  - Agriculture
  - Environment and natural resources
  - Commerce and industry
  - Etc.

The **CDIS** comprises the following sub-systems:

i. Land Information Management System (LIMS)
ii. Agricultural Management Information System (AMIS)
iii. Transport Infrastructure Information System (TIIS)
iv. Health Services Information System (HSIS)
v. Education Services Information System (ESIS)
vi. Environment Monitoring System (EMS)
vii. Public Amenities Management Information System (PAMIS)
viii. Businesses Information System (BIS)
ix. Spatial Planning Information System (SPIS)
x. Housing and Buildings Information System (HaBIS)
xi. Early Warning and Response Information System (EWARIS)
xii. County Revenue Information Management System (CRIMS)

The CDIS will support the **3is Framework** (Information–Interventions–Impacts) in Vihiga County


CDIS
(EO,GIS,GIT, ICT)
TIIS
AMIS
HSIS
ESIS
LIMS
EMS
CRIMS
PAMIS
EWS
BIS
HaBIS
SPIS

Vihiga County to date ……..

- Geo-information needs assessment undertaken to inform the CDIS
- Establishing the Geospatial Technologies Services under the Department of Physical Planning, Land & Housing
  - Prepared budget for GIS software, hardware and consultancy
  - Commenced recruitment of GI staff
  - Airbus Defence and Space has provided very high resolution Pleiades imagery (50cm) covering the entire County
- County Government of Vihiga is keen on the following:
  - Strategic partnerships in the area of GI capacity building,
  - Strategic partnerships in implementing the various components of the CDIS *(Airbus : Land Information Management System, GMV: Spatial planning, & eHealth)*
  - South – South and North – South collaboration in research and technology transfer and best practices
- As Governor, I wish to:
  - Make Vihiga a model county in Kenya in the application of geospatial technologies in the implementation of SDGs
  - Champion GI in all counties in Kenya through the Council of Governors (CoG)

CONCLUSION

- The role of Geospatial technologies in facilitating good governance, sound planning, and sustainable development cannot be over-emphasized.
- Developments and trends in Geospatial and other allied technologies only point to a favorable course for decision makers
- As a Governor, heading a County Government, and a Geospatial scientist, I purpose to use, demonstrate and champion the application of Geospatial technologies in supporting better planning and decision making in Africa.
- This is how we will empower Africa to meet Agenda 2063, the Sustainable Development Goals, among other targets

Thank You