

APPLICATION OF NBS GIS DATABASE

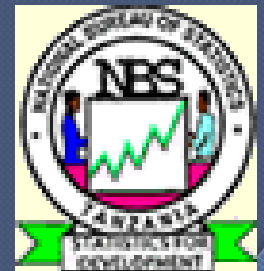
**Presented to Sub-regional workshop on
integration of administrative data, big
data and geospatial information for the
compilation of SDG indicators**

23-25 April, 2018

Addis Ababa, Ethiopia

By: Deogratius Malamsha

**National Bureau of Statistics
Tanzania**



Overview

- Census maps of varying levels of specificity are an integral part of modern Population and Housing Censuses
 - They provide necessary spatial reference for the population eligible for enumeration
 - They help to ensure total coverage of the population during enumeration as they make it possible to avoid under/over enumeration
 - They assist in planning and controlling the enumeration and ensure that the data is allocated to the correct administrative units.
 - They provide the basic frame for sampling

Background

- The 2002 census preparatory mapping work spread over a period of approx 4 yrs(Feb 1997 –June 2002)
- Although the 2002 census was successfully carried out, the cartographic preparations experienced many difficulties, including lack of up to date topographic base maps
- After the census, it was decided to develop a comprehensive inter-censal mapping programme with an objective of developing GIS within NBS and continual updating of the census geographic frame to improve its accuracy and content

Main activities:

1) Adjustment of Enumeration Areas used during 2002 Population and Housing Census

• What is involved?

- *Review EA size – 60 to 100 hhs in both urban & rural*
- *Revision of the Coding Scheme – 12 digits instead of 10*
- *Collection of additional data for GIS input*
 - *spatial and non-spatial data for village/ward offices, educational and health facilities, water points, police stations, etc;*
 - *village altitudes – i.e. height above mean sea level;*
- *Transform from analogue to digital (digitization of EA boundaries)*

Procedure

- ❖ *Physical visits to localities*
- ❖ *Capture and record on special form, GPS coordinates of individual features (spatial information) with their attributes like name and type of facility.*
- ❖ *Transfer map details onto base maps, (topo sheets, orthophoto maps, satellite images such as SPOT 5 , QUICKBIRD, etc. of useful resolution and detail for rural/urban settlements).*
- ❖ *Digitizing the updated map with EAS*

GIS development (cont'd)

- *Enter all the field data into the database*
 - *Create attribute tables*
 - *Create geo-database*
 - *Link data on features into GIS*
 - *Spatial analysis for decision making like spatial planning and thematic mapping can be done at this stage*
- *EA map, ward maps, etc., can be automatically generated as required*

Material Used

- Digital aerial photography and ortho photos
- Satellite imagery
- Topographic base maps of 1:50,000
- TP and Village drawings
- GIS, GPS and related software
- A0 Scanner and A3 Printers

NBS GIS Data Portal

- After making sure all Data/ Information is processed and well arranged, then the upload into a Portal follows.
- All spatial and non-spatial data are uploaded respectively.
- Visit www.nbs.go.tz, then navigate to GIS data portal

Application of the Database can be at:

- ◉ Enumeration Area (EA) Level
- ◉ Village Level
- ◉ Ward Level
- ◉ District Level
- ◉ Regional Level
- ◉ National Level



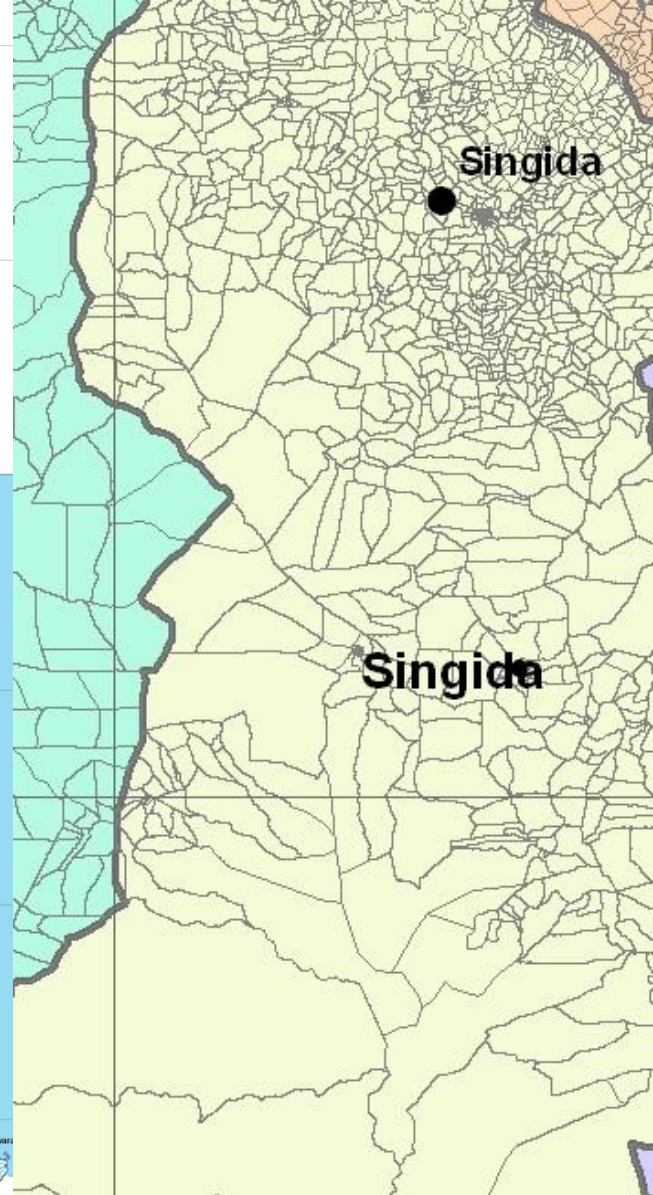
Population and Housing Census

- Conducted by NBS on 26th August, 2012
- Total number of EAs covered were 109,000
- Both Spatial and Non- spatial Data is available at NBS



TANZANIA ENUMERATION AREAS GIS DATABASE

NATIONAL LEVEL



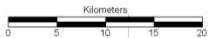
Legend

- District HQ
- Regional HQ
- Region Boundary
- Lakes



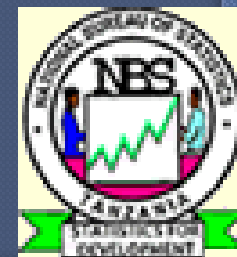
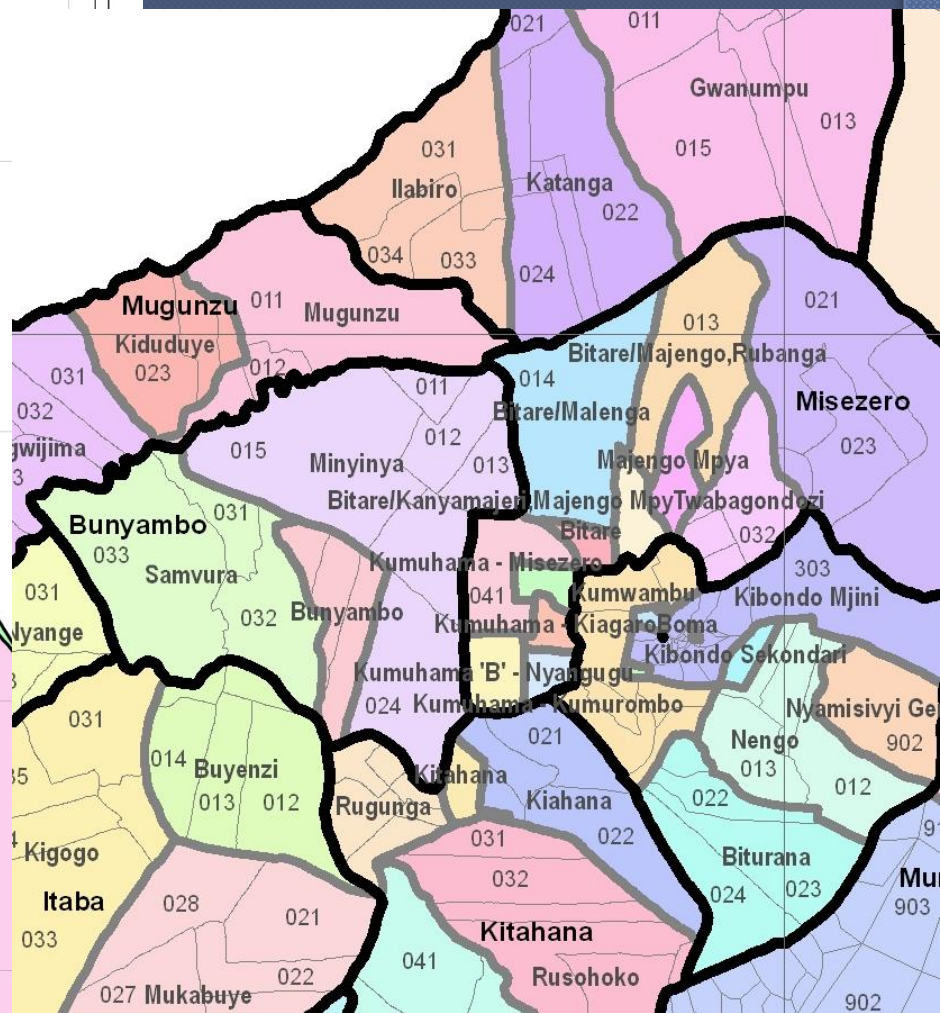
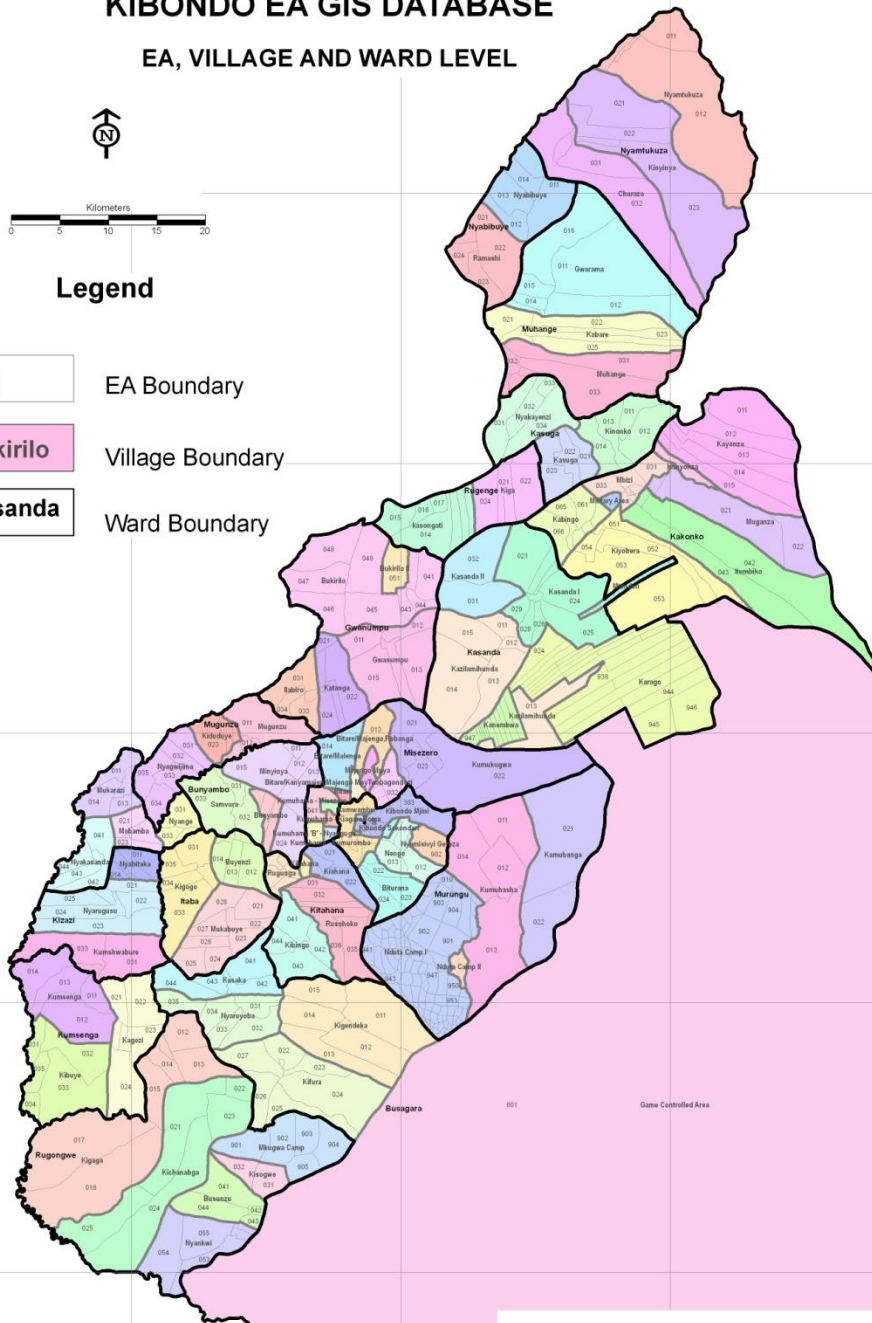
KIBONDO EA GIS DATABASE

EA, VILLAGE AND WARD LEVEL



Legend

- 031 EA Boundary
- Bukirilo Village Boundary
- Kasanda Ward Boundary

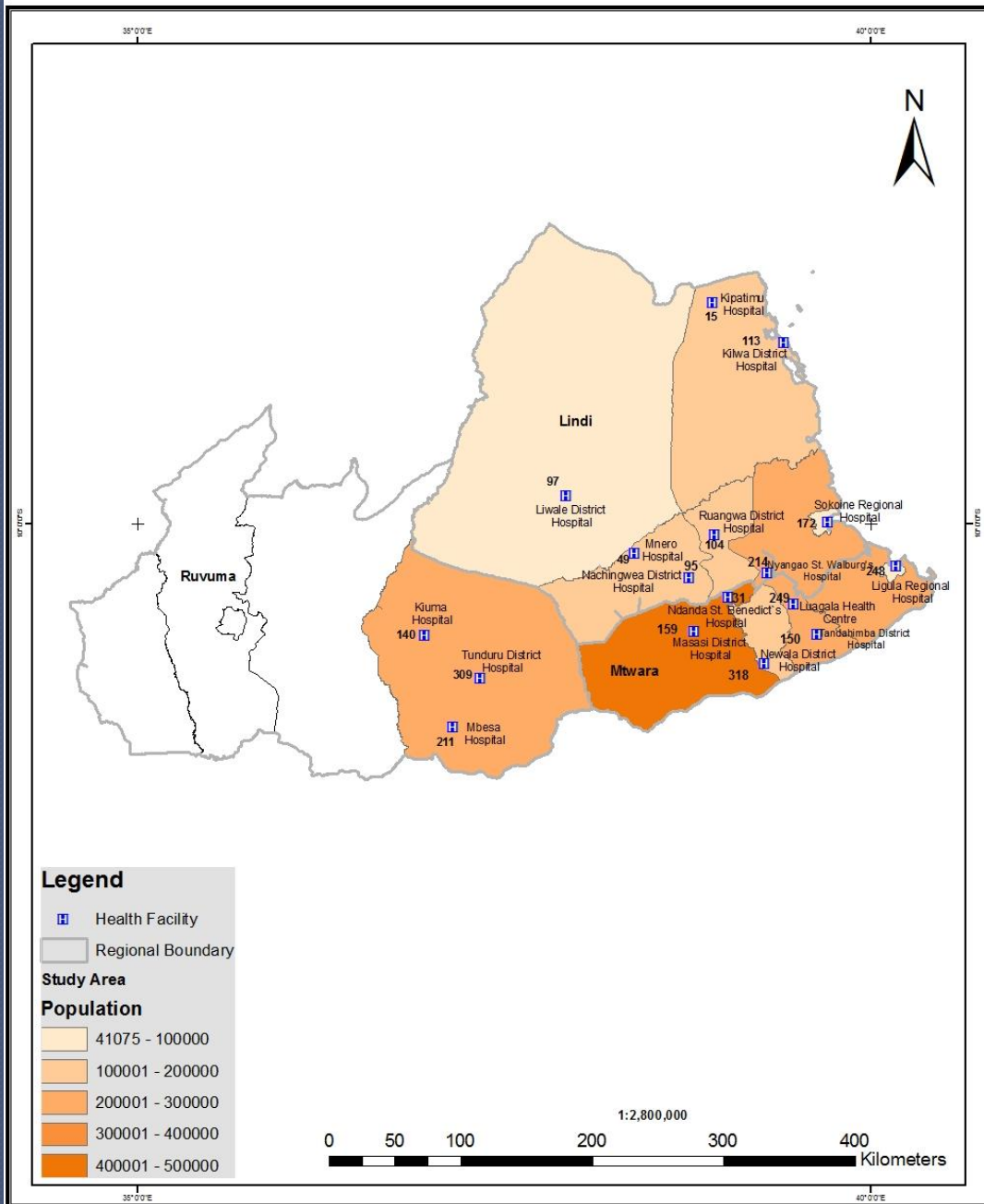


Socio- economic Application of the Database

- ◉ Poverty Mapping
- ◉ Education Facility Mapping
- ◉ Health Facility Mapping
- ◉ Sex Ratios etc,



Maternal and Child Health (Number Caesarian sections)



Thematic Applications

- Health
- Education
- Telecommunication
- Finance
- Agriculture
- Transportation
- Land Administration
- Defining New Administrative/Political Boundaries
- Planning



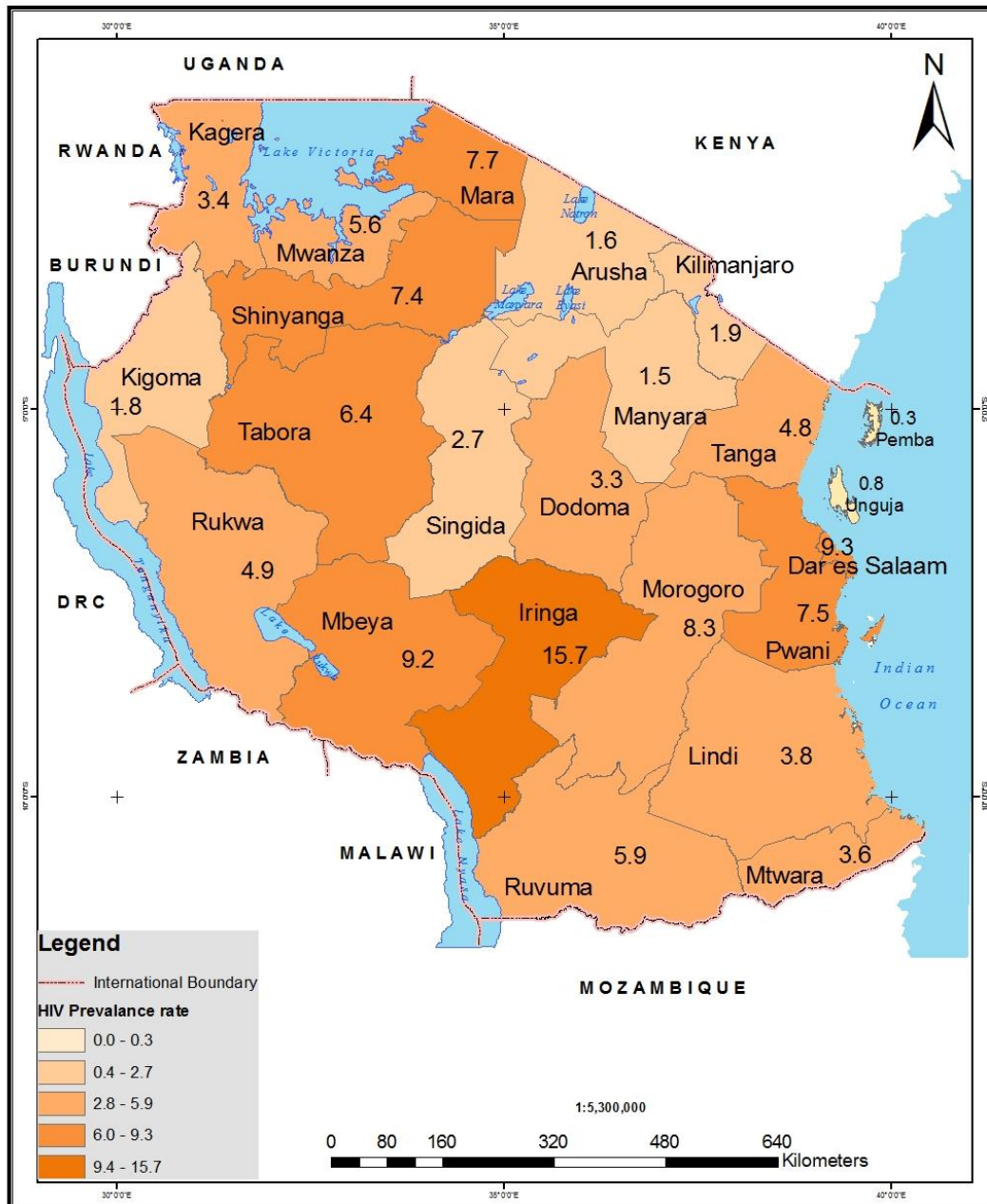
Usefulness in health sector

- Mapping of Disability Prevalence,
- HIV & Malaria Prevalence,
- Maternal and Child Health,
- Tuberculosis (TB Register) etc

***All these can be mapped by village,
ward, district, region or zone***

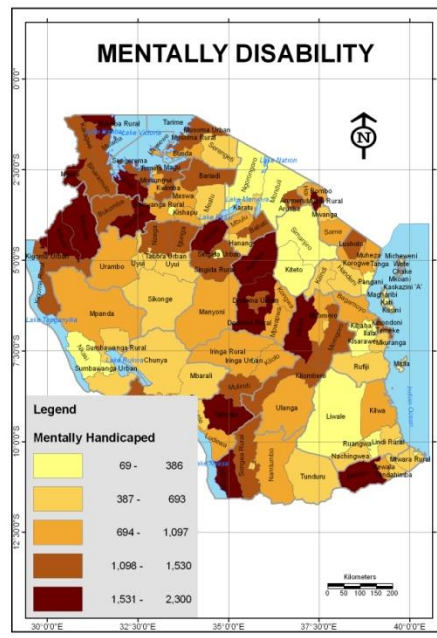
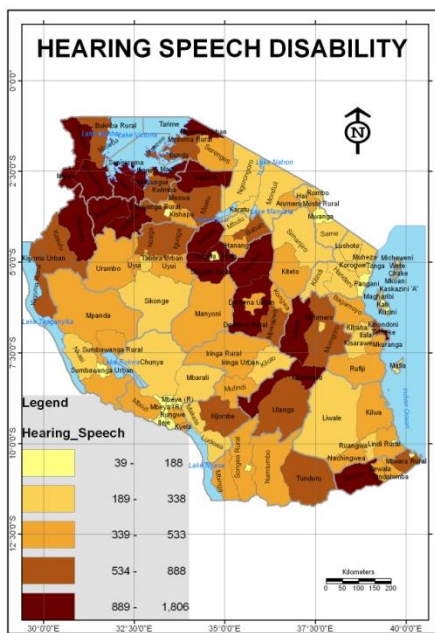
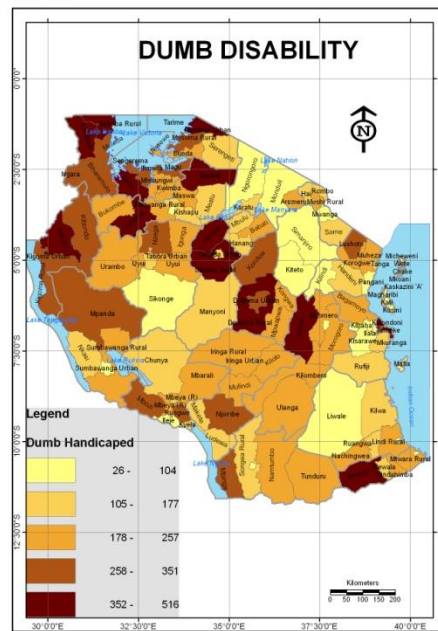
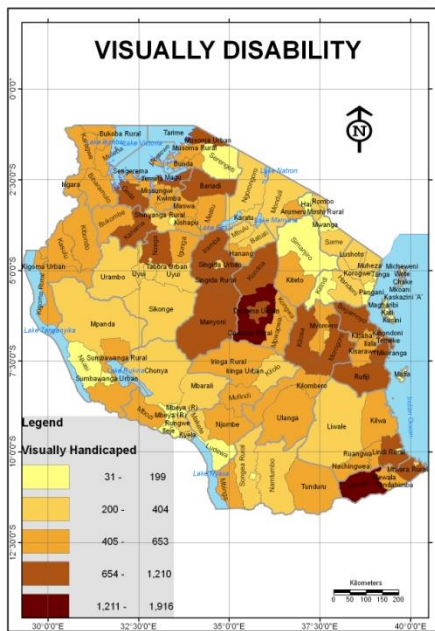


Tanzania HIV Prevalence by Region, 2007/08



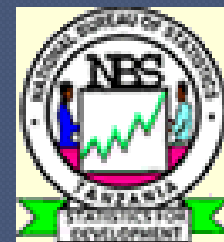
TANZANIA DISABILITY MAP

DISTRICT LEVEL

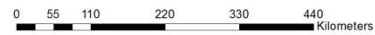
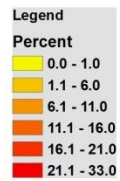
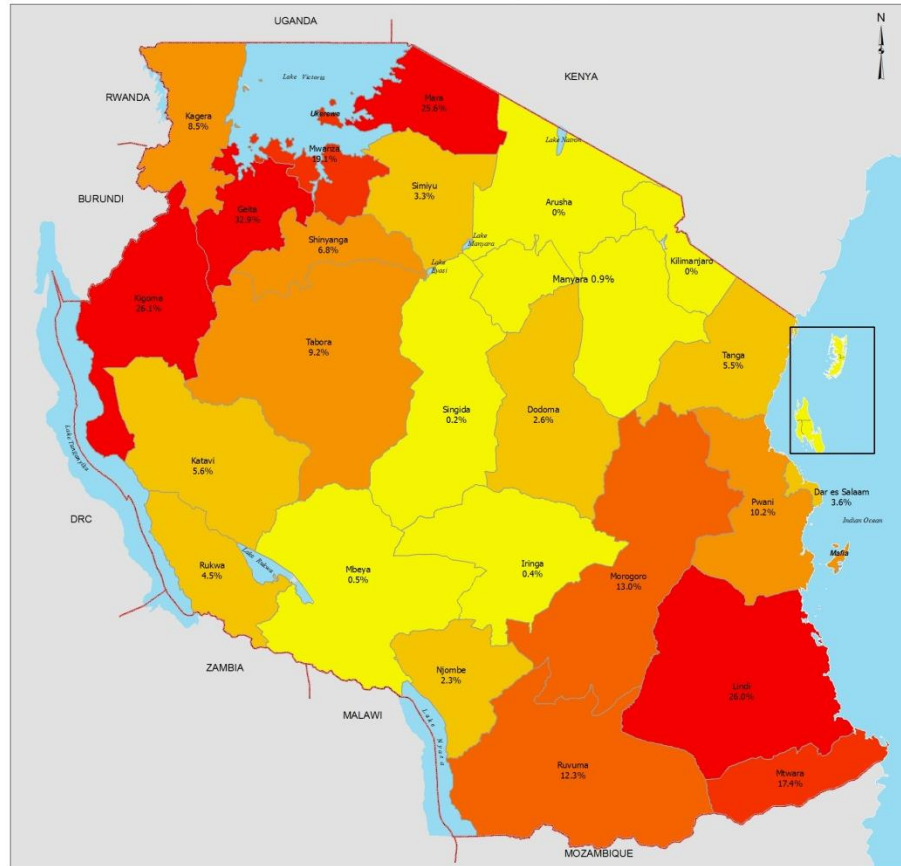


Client: Partner:

Technical Advisor: Implementing Partner:

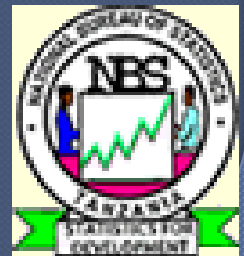


Prevalence of Malaria According to RDT by Region ; THMIS 2011-12

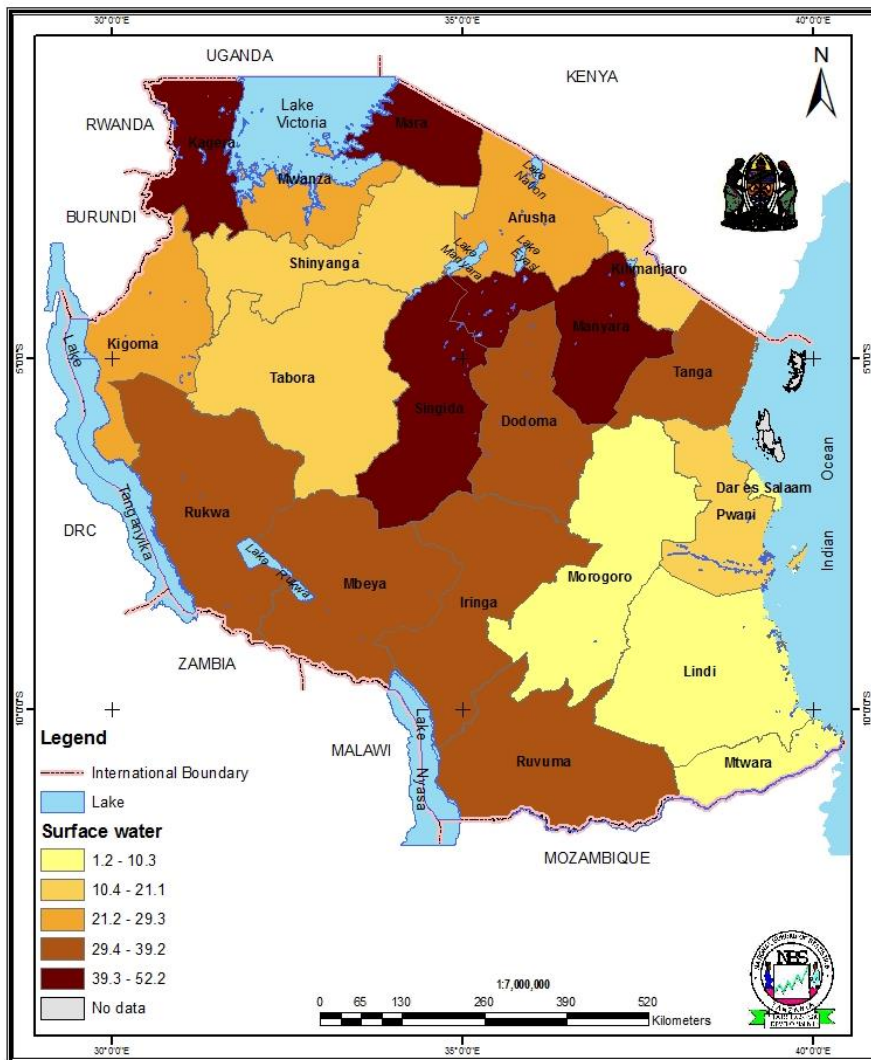


Water sector

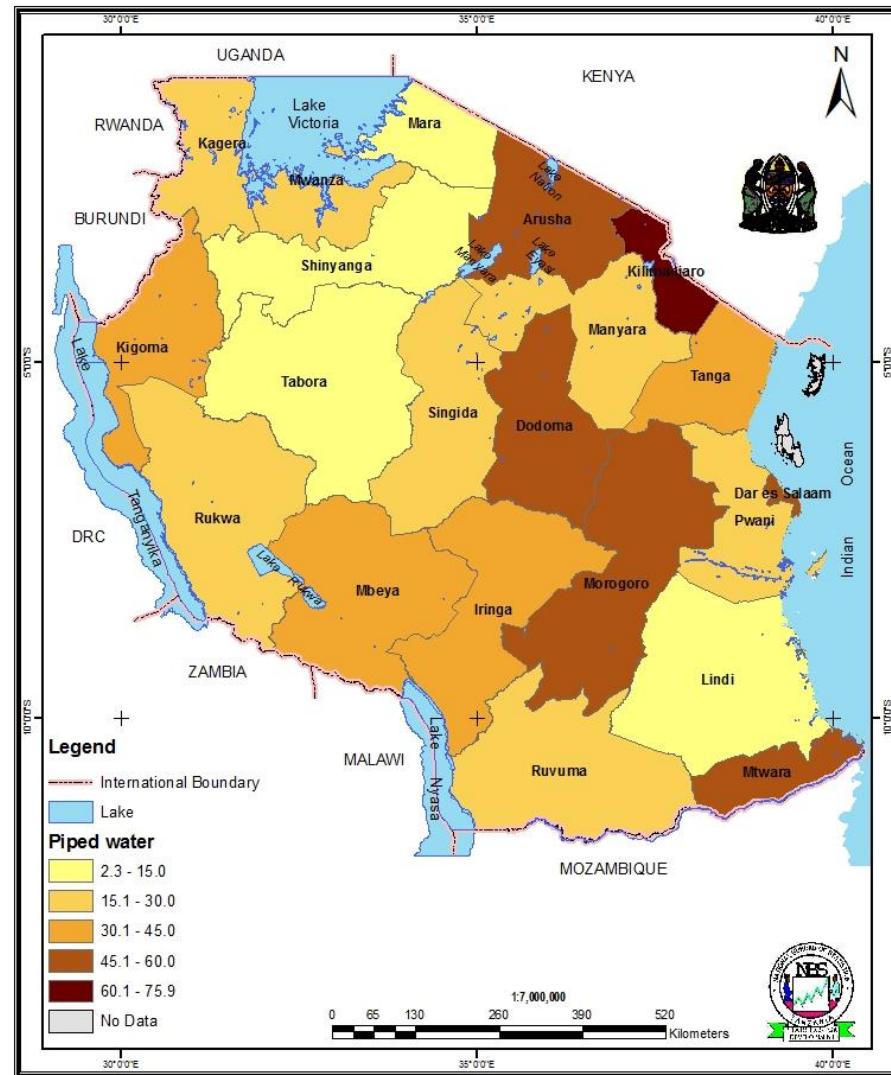
- Percent households using piped water
- Surface water
- Protected and unprotected wells
- Households using flush toilets, etc



Percentage of households using surface water

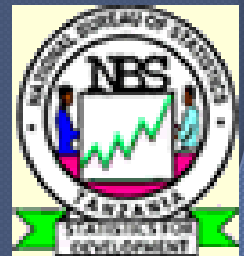


Percentage of households using piped water

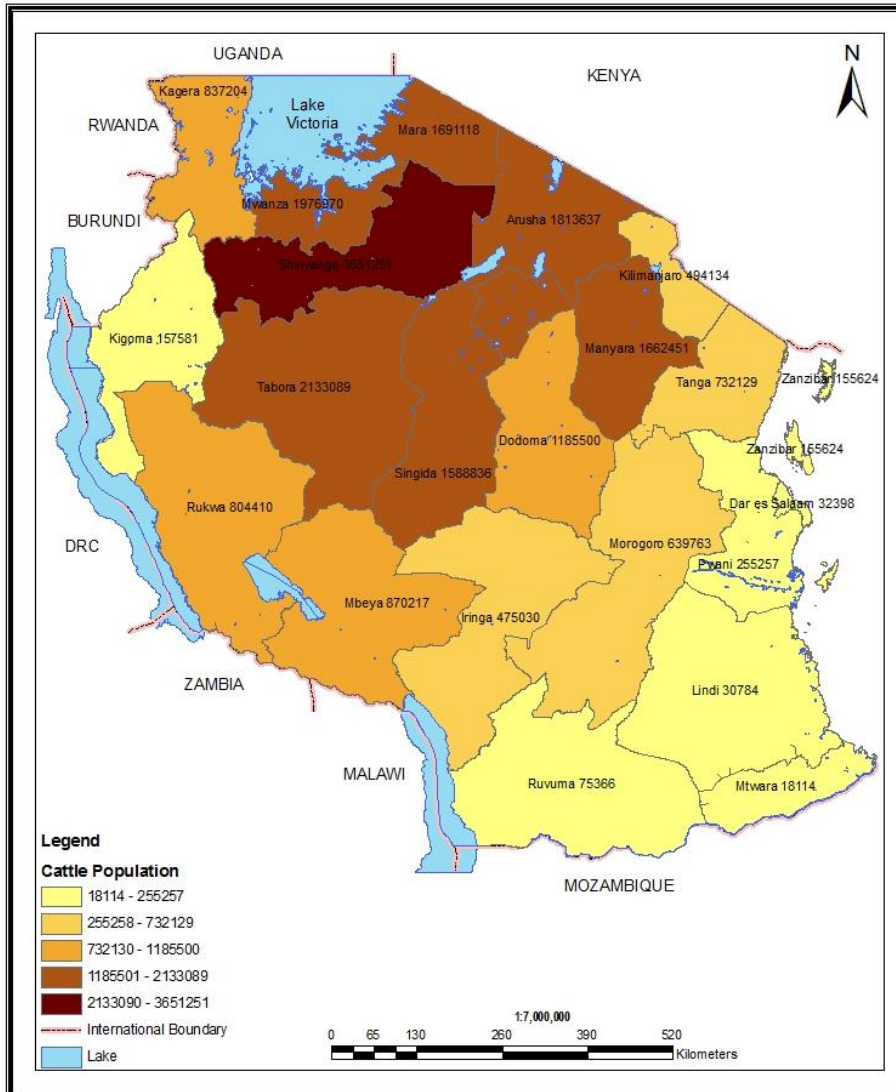


Agricultural sector

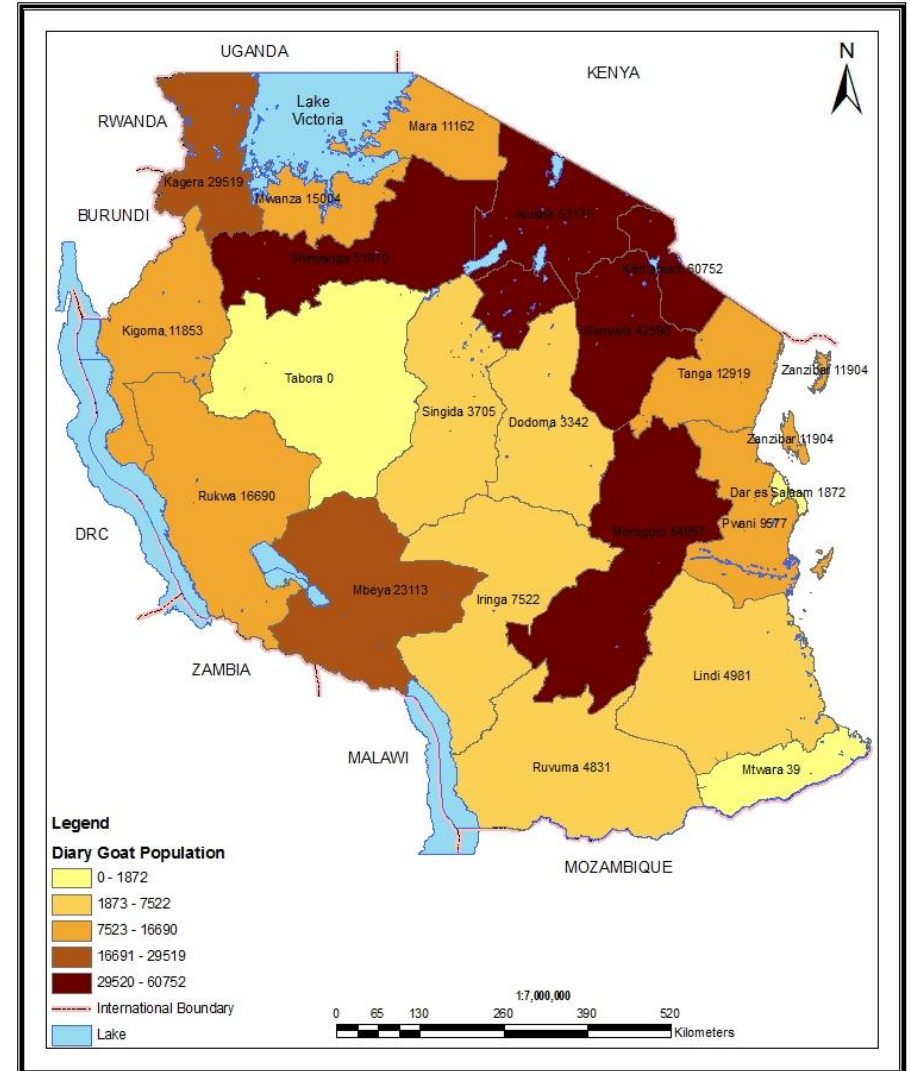
- ◉ Dairy Goat Production by Region
- ◉ Cattle Population by Region
- ◉ Improved Beef Cattle by Region
- ◉ Harvest of Mize, etc



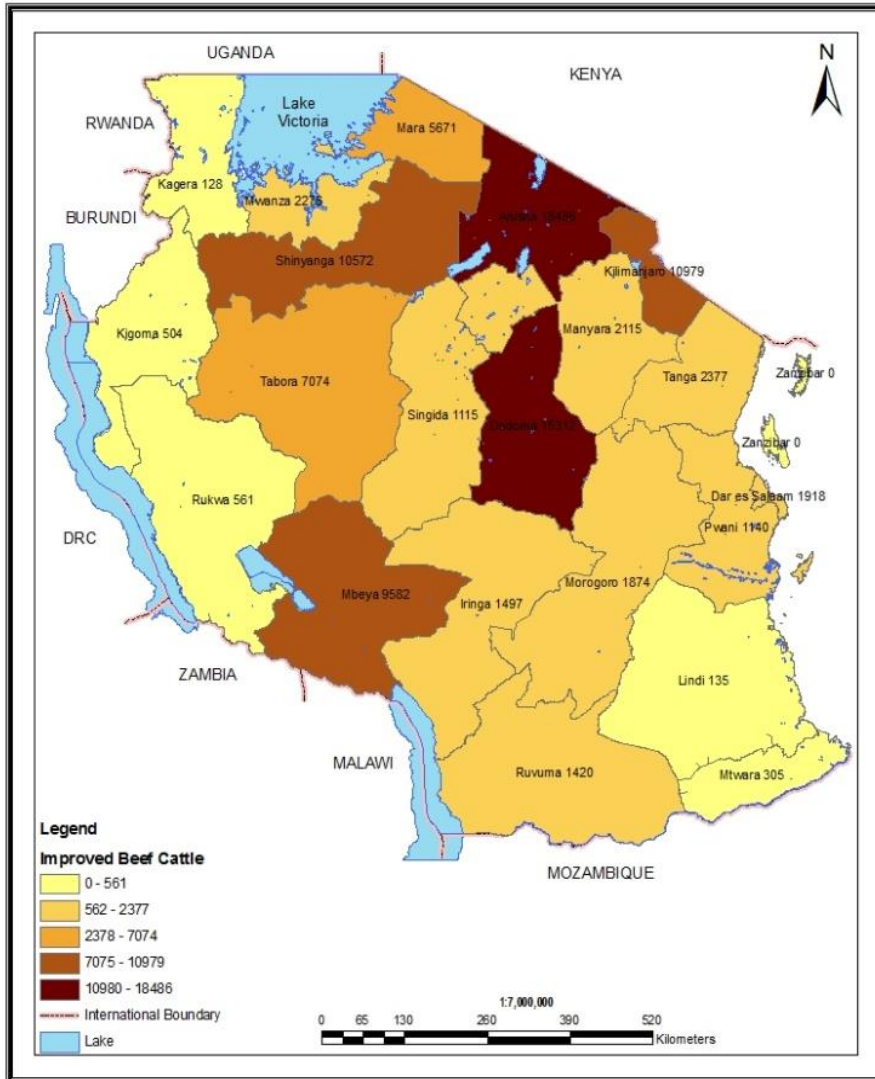
Cattle Poulation by Region as for 1st October, 2008



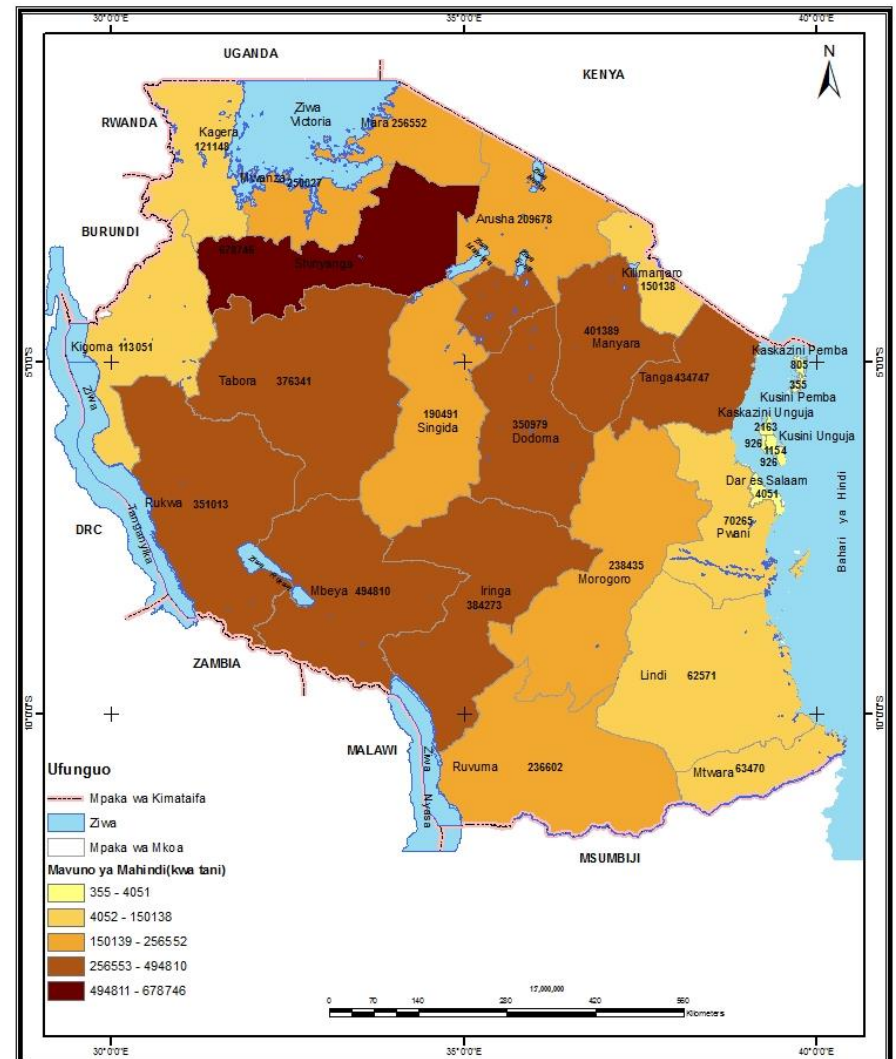
Diary Goat Production by Region as for 1st October, 2008



Improved Beef Cattle by Region as for 1st October, 2008

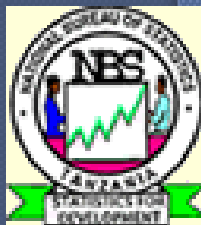


Mavuno ya Mahindi ki- Mkoa, 2007/2008, Tanzania

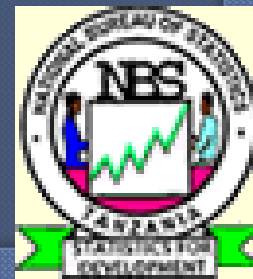
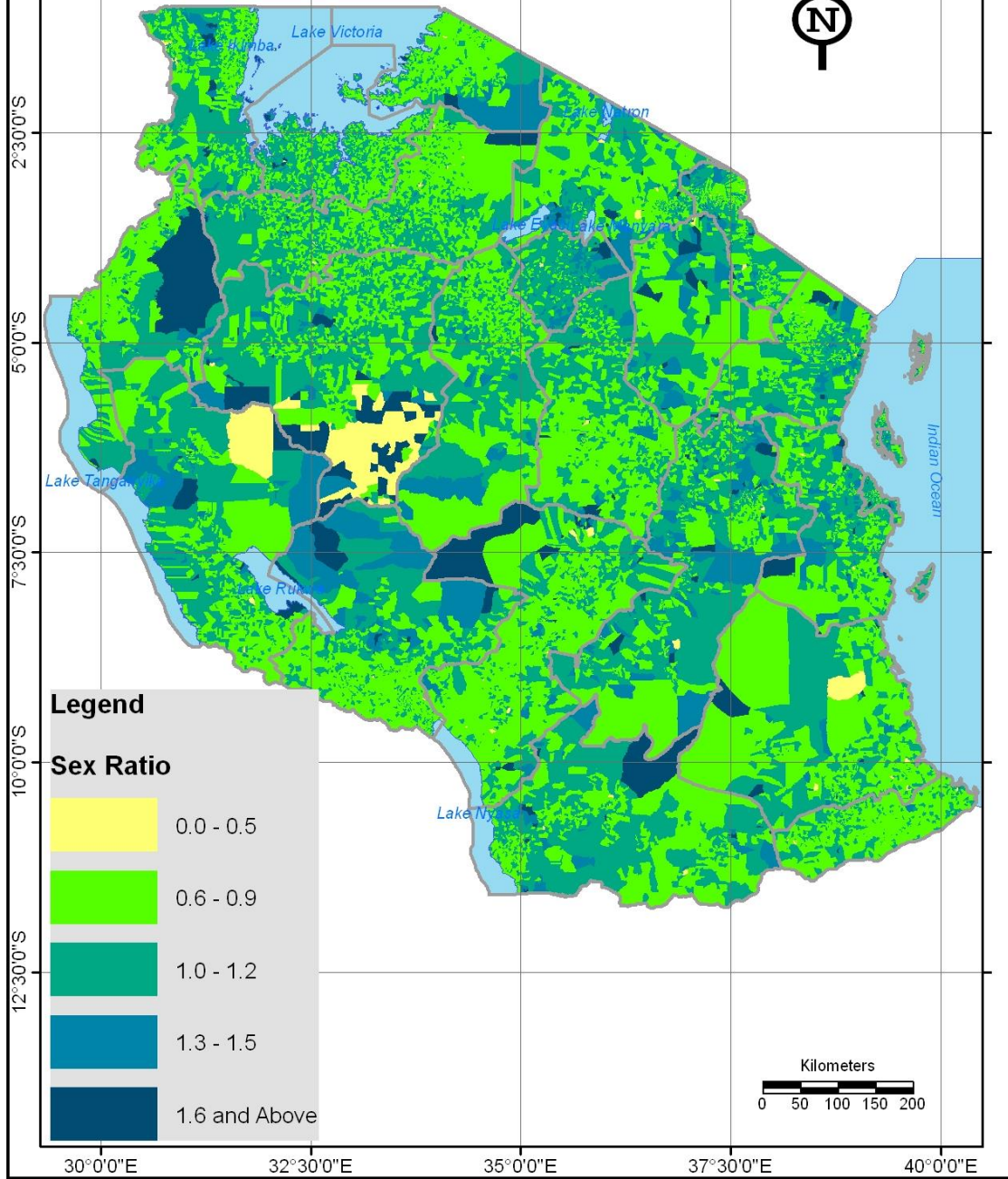


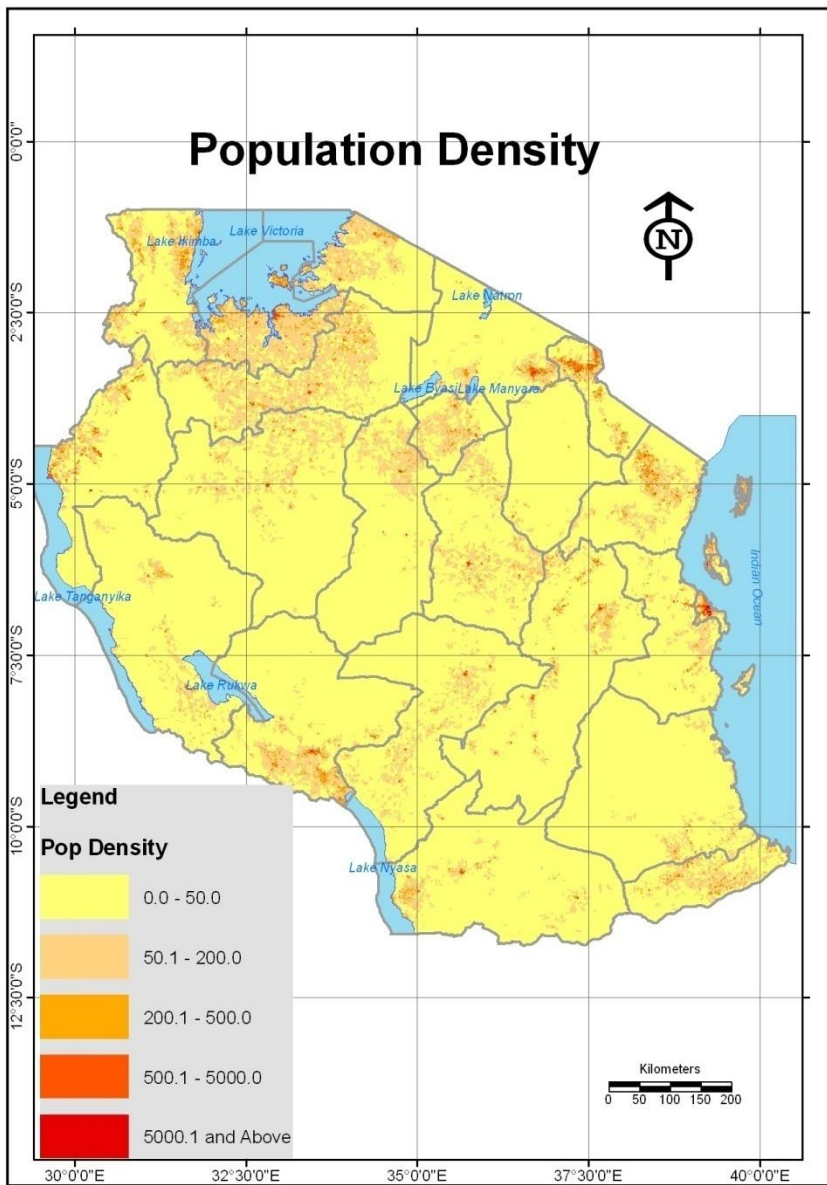
With the database we can also map:

- Population density
- Voting population
- Dependency ratio
- School enrolment ratio, etc



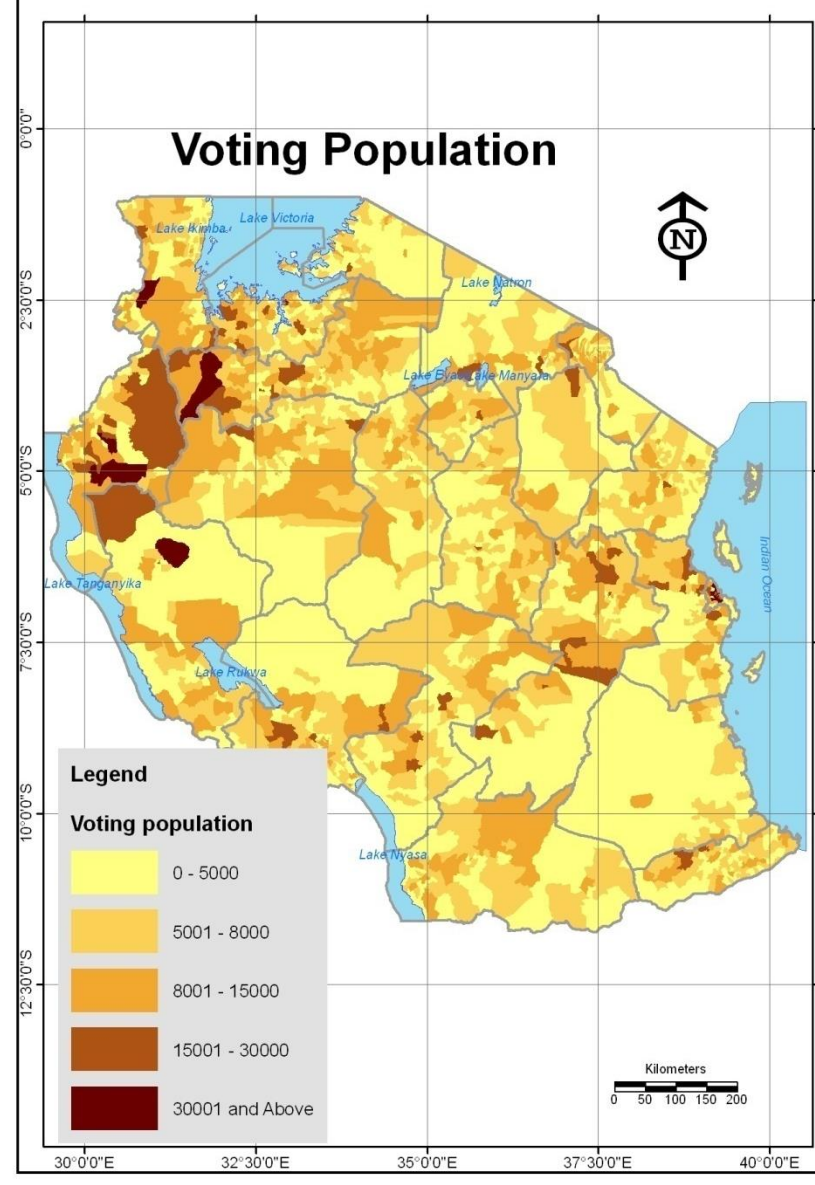
Sex Population





Client:

Partner:

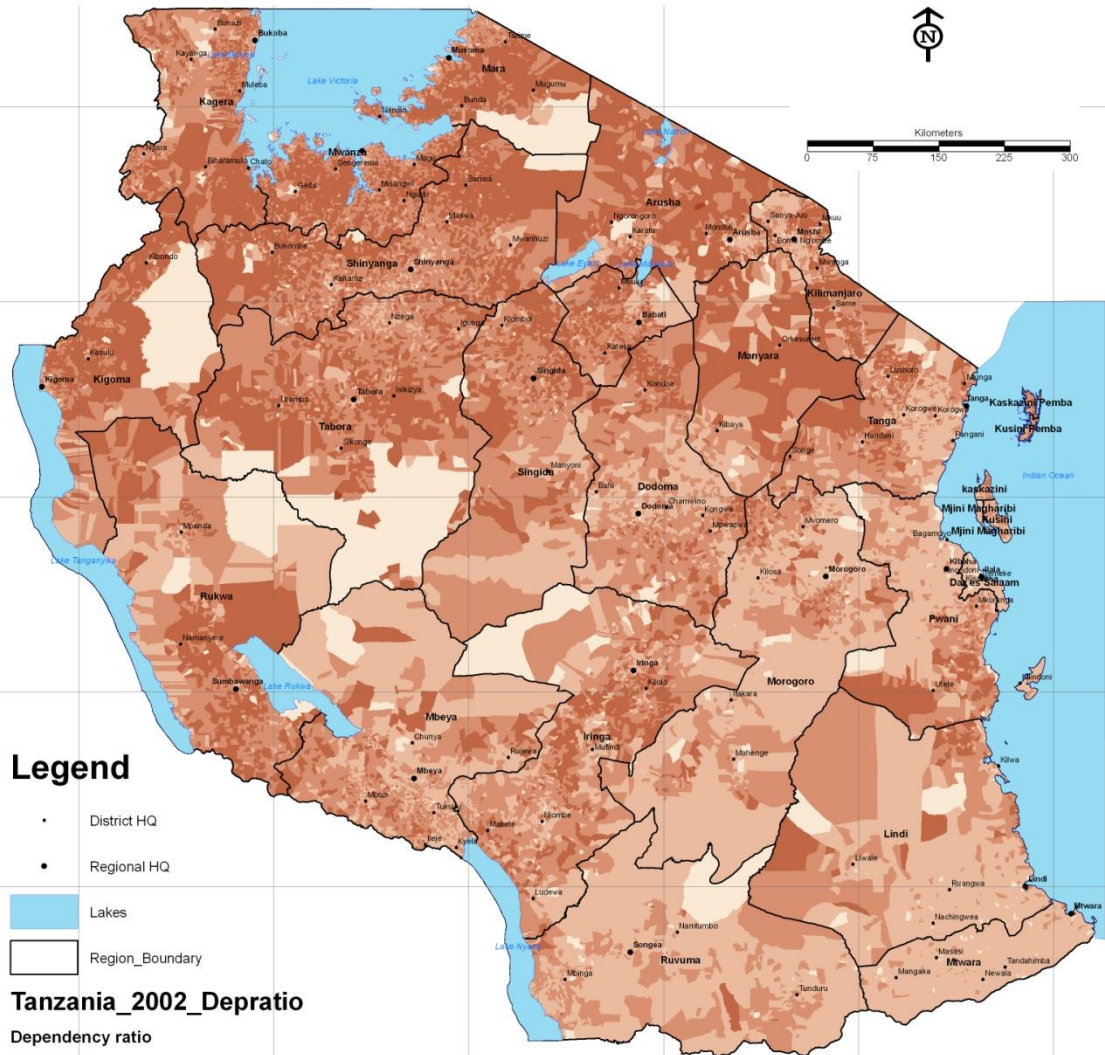


Technical Advisor:

Implementing Partner:

TANZANIA DEPENDENCY RATIO

ENUMERATION AREA LEVEL

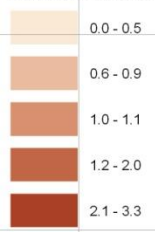


Legend

- District HQ
- Regional HQ
- Lakes
- Region_Boundary

Tanzania_2002_Depratio

Dependency ratio



Dependency Ratio:
 The dependency ratio measures the % of dependent people (not of working age) / number of people of working age (economically active).
 A dependency ratio of 1.2 means that for every 10 workers there are 12 people not of working age.


Data Source: NBS (2002 Census)



Tanzania- Road Network



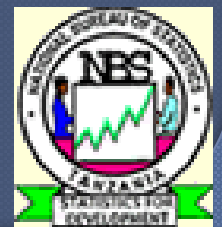
Legend

-  International Boundary
-  Paved Road
-  Unpaved Road
-  Lake

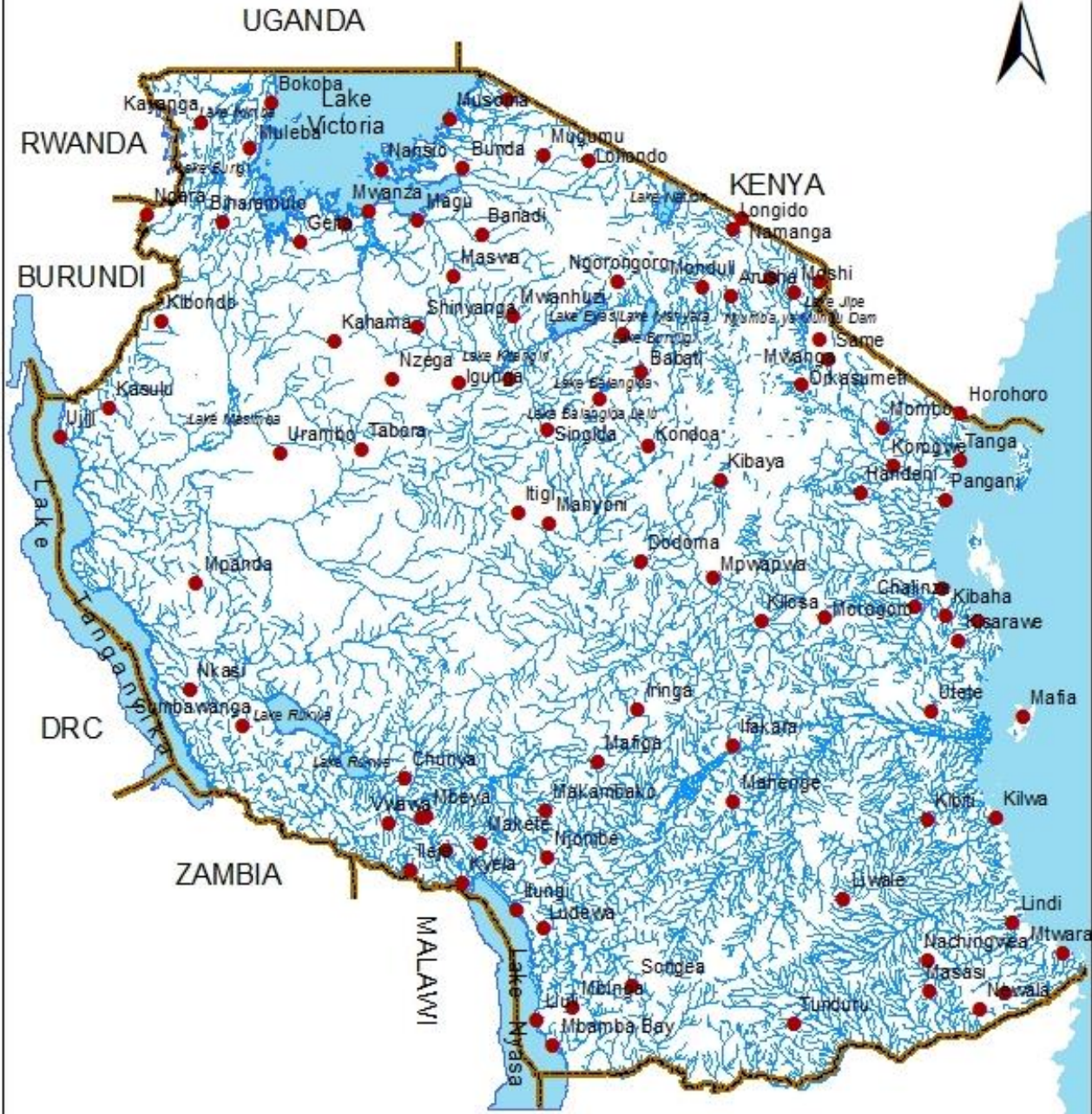


Compilation and Digital Cartography by:
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 September, 2010

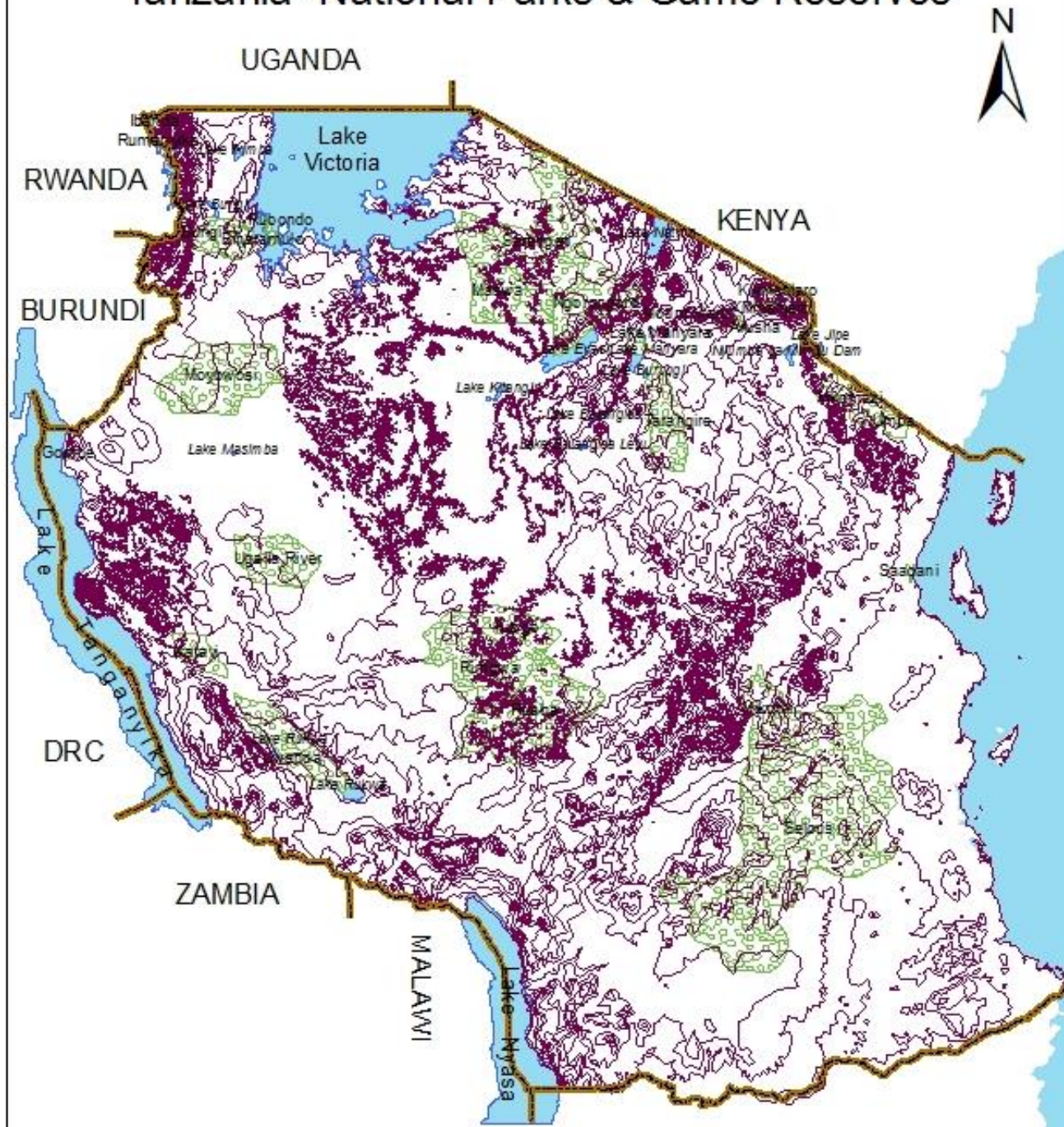


Tanzania- Rivers



MOZAMBIQUE

Tanzania- National Parks & Game Reserves



National Spatial Data Infrastructure (NSDI)

- Technology (Infrastructure)
- Policy (Data Sharing Policy)
- Data Quality (Standards e.g. ISO etc)
- People who collect data
- Promote Geographical Data Sharing

National Spatial Data Infrastructure (NSDI) Status in Tanzania

- National Steering Committee formed since 2003 soon after Population & Housing Census
- Chaired by Dr E. Mtalo from Ardhi University
- Draft of NSDI Policy is in place
- There is a budget set by NBS to facilitate Steering Committee meetings

National Spatial Data Infrastructure (NSDI)

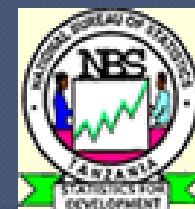
- Not yet fully established within the Country
- Only data exchange is done between NBS, SMD & IRDP
- Both Spatial and Non-Spatial are Data shared
- Other Organizations/ Ministries are encouraged to join/establish this infrastructure to facilitate data linking form these organizations

Data Sharing

- At NBS we have a Dissemination Policy where the cost for our products are well documented
- This enables data sharing with our stakeholders

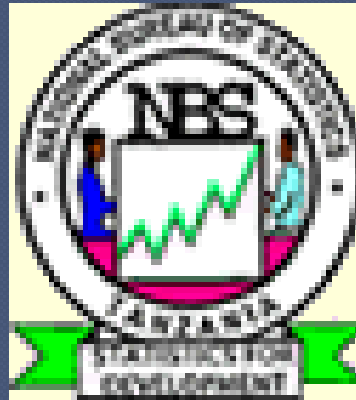
Therefore:

- All data from censuses and surveys can be presented spatially as seen in the maps shown.
- Planning can be done spatially by looking at *what is where* instead of relying on assumptions
- Decision makers and planners are highly encouraged to utilize the spatially referenced data for resource allocations.
- Private sectors like banks, telecommunication companies, hotels etc can use the spatial data to plan for potential customers, suitable areas for new investments, etc



End

Thank you



Thank you

Ahsanteni