Development of a National Spatial Data Infrastructure for Uganda (UGSDI)

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Purpose of Presentation

- To Explain the SDI Concept, components and Benefits
- To explain the historical events on the establishment of NSDI in Uganda
- To agitate for new improved approach to SDI development
Outline

- Explanation of GIS as a Concept
- Link between GIS and SDI
- GIS and SDI diffusion in Uganda
- Where are we and Why are we not moving?
- How should we move faster
How GIS Works

Natural Resources Data

Environmental Data

Economic Data

Natural Hazards

Health Data

Soils Inventory

Base Map

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Peculiarities of GIS Data Utilisation

- One GIS based solution requires use of multiple data themes
- Data collected for one purpose can be used for another
- Data collection is very expensive
- Institutions only collect data under their mandate
- A lot of synergies in institutional mandates.
Growth of GIS Concept

- From Paper to Digital Mapping
- From Digital Mapping to Limited GIS Analysis
- From Single GIS to interconnected GIS
- Opportunities caused by Developments in ICT and Earth observation.

Example of old maps
Transition of Concept from GIS to SDI

- No Institution can satisfy all its data requirements
- No institution has mandate and expertise in collecting all themes of data
- Institutions hold onto their data and are never willing to give it away
- Many institutions duplicate efforts of other institutions in collecting and managing spatial data
- Solution in to create infrastructures for sharing spatial data
A National Spatial Data Infrastructure Consists of…

NSDI

POLICY
- Institutional deals:
  - Identifying roles and data producers
  - Elaborate data sharing program (GI)

DATA
- Definition of thematic data (IG)
  - Compatibility
  - Dissemination

TECHNOLOGIC
- Protocols and interfaces for communication and search
  - Server networks
  - Service (Geo)

STANDARDS
- Metadata
- Data exchange

LEGAL
- Legal marks
- Institutional mandate
- Legal rights
- Rules and legislation

HUMAN RESOURCES
- Levelling knowledge
  - Technical and managerial
Benefits of Spatial Data Infrastructures

- Remove Duplication of data: Don’t capture a dataset if a similar dataset exists
- Removes inconsistencies: Data is developed with common standards – It can be exchanged easily
- Facilitates Easy planning of infrastructure: Viewing of data in a unified way e.g. building plans overplayed with utilities to avoid building on top of utility pipes / cables
- Encourages specialization: One agency of government responsible for a dataset – no wastage of resources in many institutions competing
- Promotes use of Geo-spatial data – Improves planning and decision making
GIS Diffusion in Uganda

Early Adopters:

- Mainly donor funded projects – Forest Department (NBS) – Quantification of Biomass - early 90s
- NEMA – Mid 1990s
- NWP – Wetland Inventory and Mapping - MID 1990s
- NARO-Kawanda– Inventory and classification of soils - Mid 1990s
- Surveys and Mapping Department : CAMPUS Project
Discussions - GIS Utilization in Public Agencies

1. Grassroot Level
2. Intermediate Level
3. Maturity Level
4. Integrated Level
5. Optimised Level

80% of Public Institutions in Uganda at Lower Levels of GIS Utilization

Only 20% of Public Institutions in Uganda at Upper Levels of GIS Utilization

Source: Kimera, 2016
Summary of spatial Data Issues in Uganda

- Un-coordinated Efforts in Spatial Data Activities
- Institutional Mandates non existent or overlapping
- Data not structured based on industry standards
- Policies for accessibility not clear/non existent
- Lack of documentation of datasets
- No uniform and consistent Data standards
- Limited datasets, quality aspects questionable
- Uncoordinated donor spatial activities
Historical perspective of SDI development in Uganda

- Early individual efforts: (1989 – 2001)
  - Environmental Information Network EIN – Coordinated by NEMA (Department of Surveys and Mapping, WWF, UBOS, WCS, MAAIF, Department of Physical Planning, NARO, NFA, Department of Meteorology, UWA, MIENR, Water Resources Dept.)
  - 2001: Study by Government on Development of GIS – Ministry of Finance to coordinate NSDI
  - National Integrated Monitoring and Evaluation Strategy (NIMES) – 2003: Department of Coordination and Monitoring at the Office of the Prime Minister (OPM)
Historical perspective of SDI development in Uganda

- Study by Geography Department, Makerere University supported by GSDI – Makerere was to host NSDI.

- In 2010, a feasibility study was conducted by ESRI Canada and GIC Ltd (on behalf of Infodev), to prepare for the establishment of a National Spatial Data Infrastructure in Uganda - NPA was selected to host NSDI.

- Some of the Early Promoters (Hon. Gorreti Kitutu, Mr. Amadra Ori-Okido, Mr. John Diisi, Mr. Bernard Muhwezi, Mr. Ali Karatunga, Prof. Swaibu Lwasa, Mr. Philip Mpabulungi, Dr. Jane Bemigisha, Mr. Richard Oput, Mr. Herbert Tushabe, …….
Why are we not moving?

- Lack of Legal and Regulatory Framework
- Limited awareness among the politicians and decision makers
- Limited capacity within the Geo-spatial Community
- Cultural factors – dedication, time management, planning..
- Are we following a wrong model?
Draft Policy in Place (see next slide) provides for governance structure, treatment of spatial datasets, custodianship and data sharing legal issues.

A law shall be drafted to implement the policy.
UGSDI Council

UGSDI – Technical Committee

Standards Working Group
- Standards 1
- Standards 2
- Standards 3
- Standards 4
- Standards 5

Policy Working Group
- Policy 1
- Policy 2
- Policy 3

2 Permanent members

IEC / Capacity Building Working Group

Coordinating Agency

GEO-SPATIAL INFORMATION COMMUNITY

Progress so far – Draft Policy
Models of SDI Diffusion

- **Umbrella Model**
  - Build National SDI to support Local SDI

- **Building block Model**
  - Build Local SDI to support National SDI

- **Tree Model**
  - Build Corporate SDI to support National and Local SDI
How should we move faster?

- Promote Sub – Networks: Energy Sector GIS WG, Land Information Systems WG, Disaster Risk Atlas, Geo-IM Working Group, Environment and Water resources GIS WG, Healthy and Social – economic WG, Citizen information WG....., (- tree Model)
- Finalise Policy and Legal Framework (push for a Presidential Directive if legal framework delays)
- Work through active sub-networks to enforce some aspects of NSDI such as standards, metadata
- Continue with capacity development to create a critical mass
- Create awareness at cabinet level – Make use of supportive cabinet ministers
Concluding Remark

- Almost 30 years ago since GIS started disseminating the Ugandan market
- GIS Utilisation still low as most applications have not reached maturity stage.
- Barriers for spatial data utilisation are still in place
- Efforts for developing a National Spatial Data Infrastructure are moving at a slow pace – No policy, no law and no regulations.
- Sector GIS seems to be moving faster than national efforts
- How can we use sector efforts to build a National Spatial Data Infrastructure?