Geospatial Sciences for Sustainable Development in Africa

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Information and Communication Technology for Sustainable Forest Management in Tanzania: Challenges and Opportunities

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Introduction

- Sustainable Forest Management (SFM) means the conservation, development and utilization of forest resources; improve the general level of economic activity, and to enhance the environment and standard of living in designated forest areas (USDA, 2007).
- SFM advocates for the management of forests according to the principles of sustainable development.
- The role of ICT in Sustainable Development is widely recognised

Introduction *(cont.)*

- Information and Communication Technologies (ICT) is the catch-all phrase used to describe a range of technologies for gathering, storing, retrieving, processing, analyzing and transmitting information (QSSS, 2007).
- ICT tools are recognized as crucial for enabling access to the global knowledge-based economy, thus empowering civil society actors and facilitating their participation in the sustainable development of their countries.

ICT in Africa

- The use of ICTs has grown relatively rapidly in most urban areas (Status Report on ICT in Africa, 2002)
- Digital Divide is still at its most extreme in Africa, where the use of ICTs is still at a very early stage of development compared to other regions of the world.
- According to (ITU, UNESCO), of the approximately 816 million people in Africa in 2001, it was estimated that only: (a) 1 in 4 had a radio; (b) 1 in 13 had a TV; (c) 1 in 35 had a mobile phone; (d) 1 in 40 had a fixed line; (e) 1 in 130 had a PC; (f) 1 in 160 used the Internet; and (g) 1 in 400 had pay-TV.

ICT in Africa

- Digital divide btwn urban areas and the rural areas is greater. Services and users are concentrated in the towns, while the majority of Africans are scattered in small communities spread-out across the vast rural areas.
- Very limited perfusion of the telecommunication networks into rural areas and irregular or non-existent electricity supplies are a common feature and a major barrier to use of ICTs, especially outside the major towns (ICT-Status Report, 2002).

Policy context and ICT in Tanzania

- Tanzania Development Vision 2025 - recognizes ICT a major driving force for the realization of the Vision →recommend ICT to be harnessed persistently in all sectors
- The National Forest Policy (1998) recognizes ICT in forestry extension services to ensure increased awareness and skills amongst the people on sustainable management of forest resources.
- The National ICT policy (URT, 2003) provides a platform for ICT in Tanzania. The Policy's Vision is: *"Tanzania to become a hub of ICT infrastructure and ICT solutions that enhance sustainable socioeconomic development and accelerated poverty reduction both nationally and globally."*

Status of ICT in Tanzania

- There is remakable progress in ICT

Indicators	1961	1993	2002
Population (in millions)	12.3	26.7	33.6
Fixed line exchange capacity	11,300	125,703	234,640
Mobile operators		1	4
Mobile subscribers		1,500	700,000
Teledensity (lines per 100 people)	0.10	0.32	1.22
Data communications operators			16
Internet service providers		1	23
Internet subscribers (Dialup accounts and Wireless)		10	14,000
Internet capacity (total bandwidth Kbits)		64	44,000
Television licences		1	24
Radio broadcast licences	1	2	18

Source: National ICT Policy, 2003

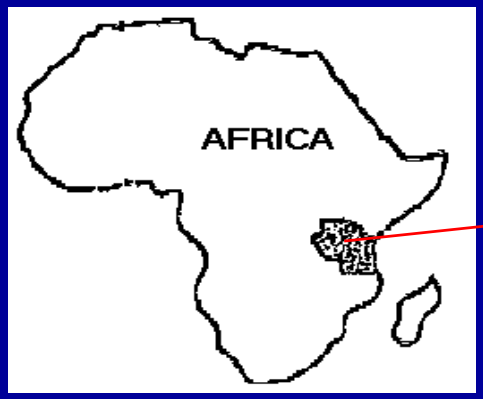
Status of ICT in Tanzania

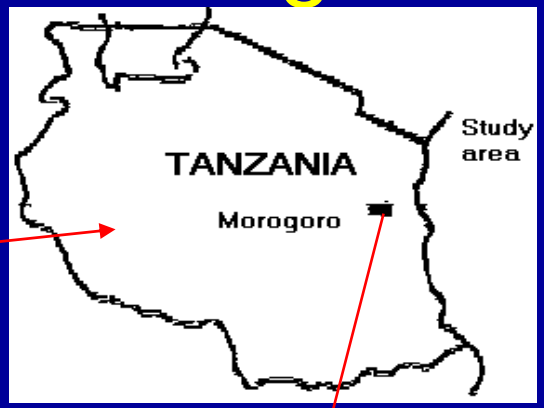
- There is significant government reforms, privatisation, telecommunication sector liberalisation, the emerging private sector and entrepreneurship, and official development assistance
- Despite the rapid improvements, Tanzania's ICT environment is still somewhat challenged.
- ICT is concentrated in Dar es Salaam, the commercial capital with little deployment or access in other urban centres or in rural Tanzania (URT, 2003).

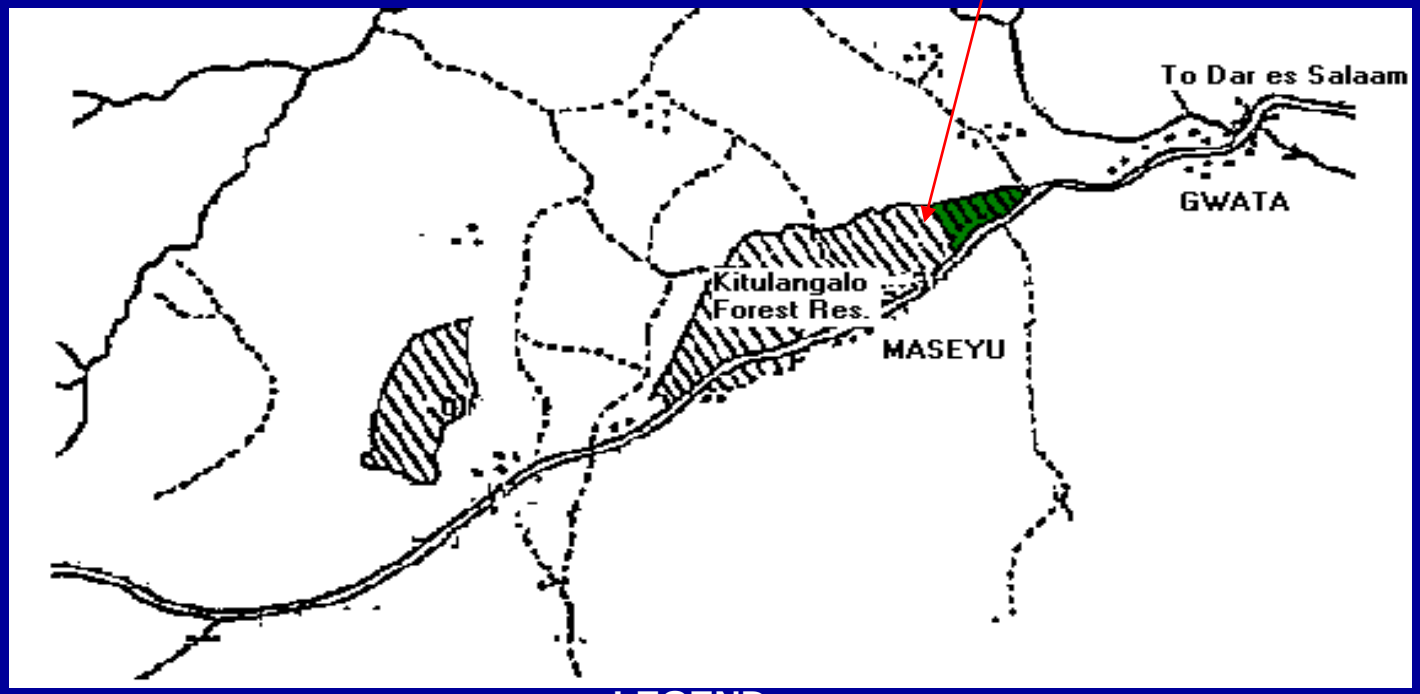
ICT and Forest Sector in Tanzania

- Remote sensing and GIS technologies are being used by individual institutions
- No established national forest Geospatial Database
- Participatory GIS as part of participatory forest management just been tried in some areas → devolution of powers to the communities for protection and use of the resources

Case study – Kitulangalo Forest Reserve







LEGEND

Located at $06^{0}41'S$ and $37^{0}57'E$ about 50 km east of Morogoro Municipality on the sides of Zambia-Tanzania Highway. Morogoro Municipality is about 200 km west of Dar es Salaam.

Case study – Kitulangalo Forest Reserve

- The Forest is co-management by the government and the surrounding communities –aiming for sustainable forest management as provided by the National Forestry Policy.
- The main thrust of the case study was to assess the impact of ICT on Sustainable Forest Management.
- More specifically:
  - Assessed ICT facilities being used by the forest management,
  - Assessed perception on ICT by adjacent communities and the level of ICT usage in SFM,
  - identified constraints facing application of ICT in SFM

The findings

Available ICT components

Communication media	No. of respondents	Percentage respondents (N=40)
Radio	16	40
Phones	2	5
Radio and Phones	16	40
Radio, phones and TV/Video	2	5
Total	36	90
None	4	10
Total	**40**	**100**

Findings

- About 50% of respondents understood the role of ICT in SFM
- ICT facilitated the communication process in protection of forest reserve in the event of fire occurrence
- ICT enhanced the protection/ patrol activities within the forest between guards and villagers
- No data storage facilities to enable record keeping
- No established GIS database

Findings

- Limited connectivity to electricity and infrastructure,
- Limited financial resources,
- Low phones network coverage (only Celtel network is available) and
- Low knowledge on the application of ICT in SFM.

Summary of major Challenges for ICT in Tanzania

- Poor ICT infrastructure development,
- High cost of broadcast equipment,
- High cost of access/ interconnectivity
- Electricity power problems
- Inadequate experienced ICT personnel
- Data availability
- Lack of centralized spatial database

Opportunities

- Increased recognition of ICT as potential tools for development at all levels
- Existence of polices (Vision 2025, Forest Policy and National ICT Policy) that recognize ICT as a means for sustainable forest management,
- Prospects for investment in ICT

Conclusions

- The importance of ICT in SFM has been realised
- ICT penetration in Forest sector is still very low
- Rural electrification and expansion of coverages are inevitable for the realization of ICT in rural areas
- There is need for continued propagation of the ICT to improve data management, information and knowledge sharing

THANK YOU FOR YOUR ATTENTION