



ICT Research Opportunities and Challenges

The case of Tanzania



Introduction

- Information and Communication Technology (ICT) is a necessary recipe for development.
- ICT is instrumental in accelerating economic growth in developing countries.
- Concepts like e-Government, eCommerce, knowledge society are only but a few of very important concepts that are supported by ICT and with great impact to society.
- For positive impact, it has to be applied properly and developed over time so to meet the growing demand and meet new challenges.
- Research and Development (R&D) is therefore an absolute necessity if we are to achieve success through ICT.



Some ICT benefits

- Peace, Stability and Unity
 - Means of achieving economic growth and strengthening democracy.
 - ICT allow poor people to express themselves, overcome cultural barriers, provide unrestricted access to information and make governments more accountable
- Good Governance
 - promote e-governance/ e-government
- Improved quality and increased access to education
- A Strong and Competitive Economy
 - appropriate use of raw materials and better ways of producing goods



R&D and ICT

- ICT is a crosscutting issue to all sectors. Some research areas include;
 - ICT for health & eHealth
 - ICT for Government & eGovernment
 - ICT for learning and eLearning
 - ICT for enterprises & eBusiness
 - Software Engineering
 - Distributed Systems
 - Database Management
 - Network Technology (including network security)
 - Digital content & Digital Libraries
 - Internet Technologies
 - GIS – Geographic Information Systems



Current Status of ICT in Tanzania

Indicators	1961	1993	2002	2007
Population (in millions)	12.3	26.7	33.6	40.4
Fixed line exchange capacity	11,300	125,703	234,640	163,300
Mobile operators		1	4	5
Mobile subscribers		1,500	700,000	8,322,000
Tele-density (lines per 100 people)	0.10	0.32	1.22	0.4
Internet subscribers (Dialup accounts and Wireless)		10	14,000	50,000

Data Source: ITU World Telecommunication/ICT Indicators Database, Tanzania ICT Policy



Current Status ctd.

- There is rapid improvements in ICT environment especially in the Mobile phone and internet access.
- ICT is concentrated in major cities
 - Dar es Salaam, Arusha and Mwanza
 - little access to rural areas.
- Secondary School Computer Studies Syllabus for Forms I – IV exists but not implemented in many schools
 - Due to lack of ICT facilities and teachers.



Current Status ctd.

- Many Tanzanian websites exists
 - most written in English which is not a dominant local language.
- The potential for e-commerce is constrained by
 - Lack of local internet-friendly credit facilities and
 - An appropriate legal framework to ensure trust, security and accountability.



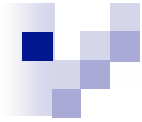
Government Effort

- Legal and regulatory framework
 - Formation of two independent regulatory bodies TCC and Tanzania Broadcasting Commission (TBC)
 - Promulgation of the National Records and Archives Management Act
- Government projects / programmes
 - Integrated Financial Management System (IFMS)
 - Personnel Control and Information System (PCIS)
 - Establishment of national TV Tanzania (TVT)
 - Websites (e.g. www.tanzania.go.tz, www.tzonline.or.tz, and www.tanzaniagateway.org)



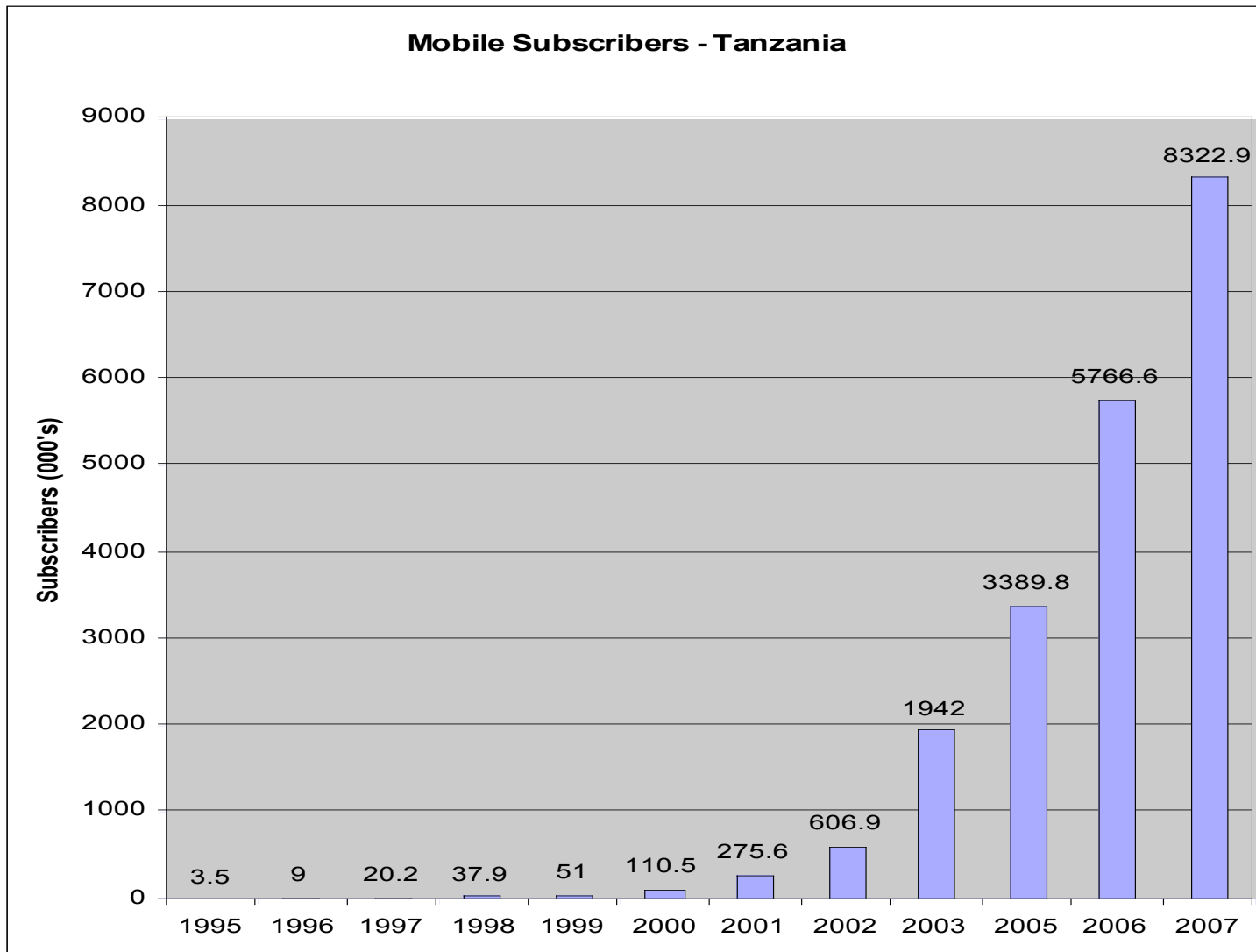
Government Effort ctd.

- New products, markets and services
 - Removal of all taxes and duties on computers and peripherals,
 - Rural community Tele-centers are being established in many parts of the country
 - Internet points of presence (PoPs) in nearly all regional centers with a 95% digital backbone and switching system
- ICT Policy in place since 2003

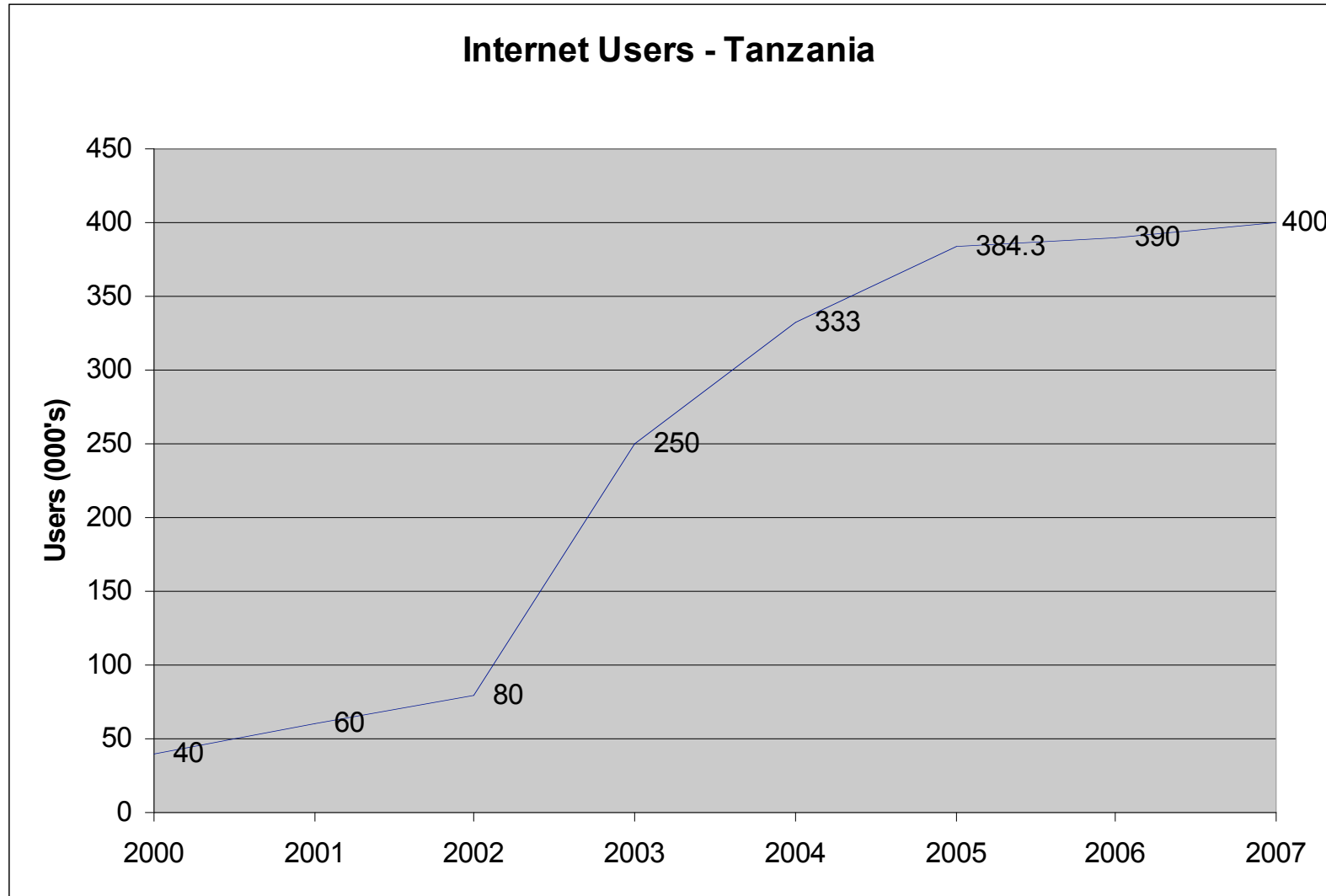


ICT Opportunities

- ICT has spread very quickly within Tanzania and across Africa as a whole.
 - This is highly remarkable to economic development, political democratisation, social advancement, cultural progress, as well as competitiveness.
- According to the statistics for Internet usage and mobile telephones
 - In 1995, there were only 3,500 mobile subscribers in Tanzania.
 - In 2007 the number recorded is 8.3 million mobile phone subscribers!
 - Similarly, there were only 40,000 internet users in year 2000,
 - while in 2007 the number shot up to 400,000 users



Data Source: ITU World Telecommunication/ICT Indicators Database

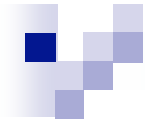


Data Source: ITU World Telecommunication/ICT Indicators Database



ICT Opportunities ctd.

- Despite of this rapid growth, the figures are still very low compared to the developing world [\[i\]](#).
 - This provides tremendous opportunities for investors.
 - Higher needs for strong research base to spearhead this trend in the right direction.
- Under-sea fiber optic cables
 - Expected to lower internet costs significantly and provide higher access speeds. Access to 250 million people, or one in four African people
 - The cables have already reached Tanzanian coast and expected to be operational by June this year.
 - The East Africa Submarine Cable System, or EASSy [\[i\]](#) and SEACOM [\[ii\]](#)
 - Will transform the African telecommunication landscape



ICT Opportunities ctd.

- Fast growth of institutions offering ICT training in the region
- Political commitments (e.g. existence of an ICT Policy)
- Increasing awareness of the importance of ICT for development among the people.
 - Huge market which has not been fully explored



ICT Challenges

■ **Over-dependency on donor support**

- There is no local manufacturer of ICT equipment in Tanzania and most of the dealers or agents import these products from abroad [\[1\]](#).
- The use of open-source software is still low due to among others, low awareness and accessibility.
- Small skilled capacity to support the ICT industry in terms of developing, selling or supporting hardware and software.
- Most of the ICT tools are expensive and internet service fees are too high
- Research institutions rely heavily on donor support to acquire ICT facilities.



ICT Challenges ctd.

■ **Inadequate ICT experts**

- Research Institutions face many challenges when seek to build up ICT expertise.
- Trainers with the necessary skills are in short supply
 - Few training institutions therefore supply of ICT graduates is low.
 - The number of annual graduates per million habitants is about 5 percent



ICT Challenges ctd.

- **Failure to retain ICT manpower in research centers**

- Tanzania universities are unable to recruit and retain ICT experts because they are always attracted to greener pastures from private companies.

- **Underutilization of ICT facilities**

- Most of ICT tools are underutilized due to low level of ICT competencies.



ICT Challenges ctd.

■ **Lack of local contents**

- Without local content the benefits of ICT will not be realized.
- For instance, most of the stuff is in English, which is not a popular local language.
- UDSM initiative of developing the Swahili Language Interface of Linux software is a step in the right direction.



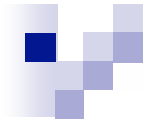
ICT Challenges ctd.

- Low income among people
- Low infrastructure to support ICT growth and research
 - esp. Electricity (only 14% of the country has electricity)
- Tendency to use ICT as a pride rather than a supporting tool for development.
 - A research done by Mercer [\[i\]](#) on Tanzanian NGOs revealed that most NGOs have internet facilities but are highly detached from the people.
 - Facilities are only used for communications with donors (sending proposals etc.)



Recommendations

- Concentrate not only on improvisation of facilities but also on the impact of the investment in achieving set objectives (through research)
- Support capacity building projects in research institutions
- Governments to give consultancy priorities to research institutions.
 - This will not only create strong base of experience but also motivate research staff



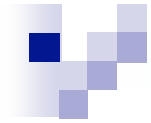
Recommendations ctd.

- Facilitate implementation of research findings
- Needs coordinated efforts from various ICT players to avoid re-inventing the wheel and waste useful time
- Role of mathematics should not be ignored
- Promote development of new ideas locally rather than being mere consumers of technology



References

- [1] United Republic of Tanzania (2003): National Information and Communications Technology Policy, Ministry of Communications and Transport, [http://www.developmentgateway.org/download/134325/public2002_ICT-\(First_Order_Policy_Draft\).doc](http://www.developmentgateway.org/download/134325/public2002_ICT-(First_Order_Policy_Draft).doc),
- [2] ITU World Telecommunication/ICT Indicators Database; <http://www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx>
- [3] Etta F & Elder R (2005): At the Crossroads: ICT Policy Making in East Africa, East African Educational Publishers/IDRC,
- [4] EASSy: <http://www.cipesa.org/195>
- [5] SEACOM: <http://www.seacom.mu/index2.asp>
- [6] Lwoga E., Sife A., Busagala L., Pand C. (2005):the role of universities in creating ict awareness, Literacy and expertise: experiences from Tanzanian Public universities, *Directorate for ICT Support, Makerere University Uganda*.
- [7] Mercer C. (2004): **ICTs in Tanzania: donor optimism or democratic development?**, 'Engineering civil society: ICT in Tanzania' by Claire Mercer, Review of African Political Economy, no 99, pp 49-64.



Thank you!