

ICT

PENETRATION AND TRENDS IN THE THIRD WORLD

THE CASE OF UGANDA

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OUTLINE

Abstract

- 1.0 Introduction
- 2.0 Uganda: Demographics
- 3.0 ICT Licencing Overview in Uganda
- 4.0 Global ICT Penetration: Regional Statistics
- 5.0 ICT Trends in Uganda
- 6.0 Challenges and Proposed Actions
- 7.0 Conclusion

ABSTRACT

Global explosion of Internet and Mobile Communications have made knowledge about ICT technologies and their developments ubiquitous. It is now ICT technologies and services adoption, levels of penetration, ability to buy and roll out infrastructure, skill levels, regulation or government controls that separate the developed and developing world.

This paper gives a comparative overview of ICT penetration and trends in the world with specific reference to Uganda; an example of a developing country. Demographic data, ICT licensing, types of network/service providers, available technologies, and mobile, fixed, internet, broadband and other emerging mobile applications penetration trends, broadcasting (Radio and TV) are analyzed and discussed.

After analyzing ICT penetration trends, the paper gives the factors responsible, and goes to propose actions that could be used to improve ICT penetration.

1.0 INTRODUCTION

The synchronization of the Computer, Internet and Mobile or Wireless communications are the three land marks that have truly defined the world as a global village. With these, it is now possible to get to know within a fraction of a minute any event that occurs in any part of the globe. Knowledge about the latest technological developments is no longer a barrier that separates the developed and third or developing world; but rather the ability to be able to deploy such technologies. This is now mainly a question of ability to afford or finance and have the requisite skills. Even where these latest technologies have been deployed, the only difference now is the extent to which the services have penetrated the populations.

This paper explores the penetration trends of ICT technologies and services in the developing world. Using Uganda as an example, it gives ICT licensing overview, ICT global and regional trends, analyses similar trends in Uganda, and finally gives the challenges or obstacles that are faced, and proposes how to overcome them.

2.0 UGANDA: LOCATION AND DEMOGRAPHICS

Location: Landlocked in Eastern Africa, astride Equator (0°)

Borders: Kenya, Tanzania, Rwanda, Southern Sudan, Dem. Rep. of Congo (DRC)

Climate: Tropical, Average temp 25°C



Figure 1: Map of Africa Showing location of Uganda

Statistics

Total Area - 241,038 km² : Land - 197,100 km² ; Water - 43,938 km²
Population (Mid 2012): Total - 34,131,200; Kampala City- 1,723,300
Pop (2002 Census): Density - 123/km² ;

Sex Ratio: 95 Males/100 Females

Life expectancy (birth) - 50.4 yrs.; (Male - 48.8; Female - 52)

Fertility Rate (2011) - 6.2 children / woman;

Infant Mortality Rate (2011) - 54 deaths/1000 live births

Under Five Mortality Rate (2011) - 90 deaths/1000 live births

Elevation

Lowest: Lake Albert: 621 m; Highest: Rwenzori Mountain: 5,110 m

Natural Resources

Copper, Cobalt, Limestone, Salt, Gold, Hydropower, Petroleum (oil), land, etc.

Activities: Agriculture (crops and animals), Industry and Services

3.0 ICT LICENCING OVERVIEW

There are two (2) National Telecom Operators (NTOs): Uganda Telecom (UTL), Mobile Telecom Network (MTN) and over 30 licenced or registered voice and data providers. The license categories include:-

3.1 Public Service Provider (PSP)

Can have a license to offer public voice and data or capacity resale

3.2 Public Voice and Data Licence

Can provide telephony and data services (mobile or fixed or both) using one or a combination of cellular, satellite, Internet Protocol, traditional wired networks.

Can rent/lease infrastructure providers infrastructure, or build own after acquiring Infrastructure Provider Licence.

3.3 Capacity Resale license

Can resell leased services or capacity to provide services like calling cards and sell bandwidth from local or foreign operators to PSPs

3.4 Public Infrastructure Provider Licence (PIP)

Can establish, operate and maintain infrastructure for provision of services (if PSP licence holder) and/or offer it to PSPs for commercial use.

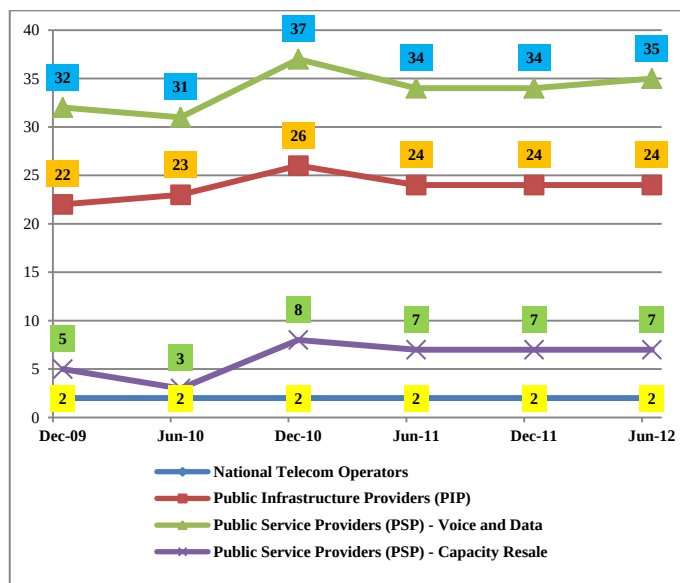
3.5 General Licence

A licensee does not pay licence fees but registers with regulator (UCC) and gets a certificate for operation. Payphone kiosks, fax bureau and internet/cyber cafés are under this category.

Can use VoIP technology within their phone shops, but are not allowed to provide prepaid services to the public without the necessary license.

NTOs have an open license that allows them to do almost all services

Figure 2: Number of Licenced Telecom Service Providers



Though there are over 30 licenced operators, just only about six key are key: MTN, Airtel / Warid, UTL, Orange, K2, and Smile. MTN and UTL provide both mobile and fixed voice and data

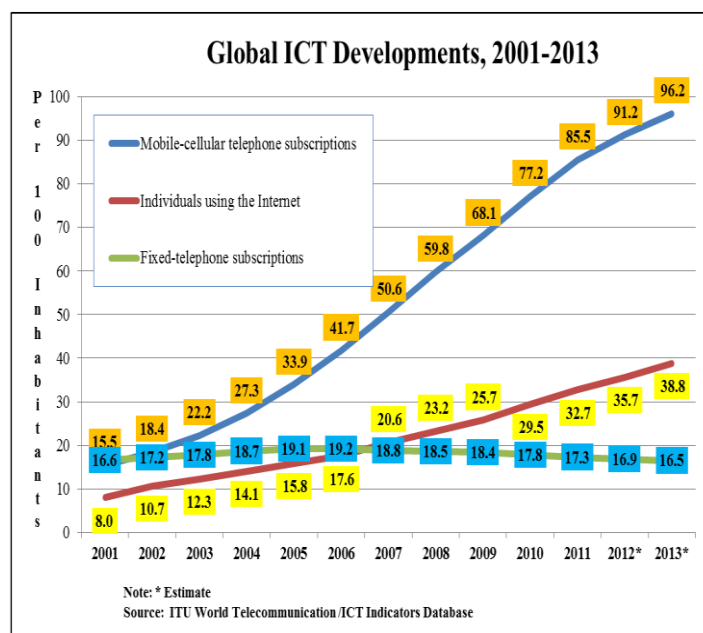
Challenges: High operational costs (lack of commercial power, old equipment, etc.); inadequate financing, Stiff competition, Low skill levels;

TABLE 1: TECHNOLOGY PLATFORMS, NETWORKS AND SERVICE PROVIDERS

Technology Platform	Providers	No
4G/LTE	Smile, MTN	2
2G/GPRS/EDGE,CDMA,3G	UTL, MTN, Airtel / Warid, Orange, K2, I-Tel, Sure Telecom	7
Fiber, xDSL	UTL, MTN, Kampala City Cable, Infocom, Roke Telecom, Google, Government/NITAU, UETCL, EASSY, Seacom,	10
POTs, ISDN, Leased Lines	UTL, MTN	2
VSAT	Afsat, Africa Online, UTL, MTN, Infocom, Maisha Networks, Spidd Africa	7
Other Wireless including WiMAX	UTL, MTN, Orange, Airtel / Warid, Foris Telecom, Tangerine, Datanet, One Solution, Augere, Infocom, TMP	11

4.0 GLOBAL ICT PENETRATION

Figure 3: Global ICT Indicators

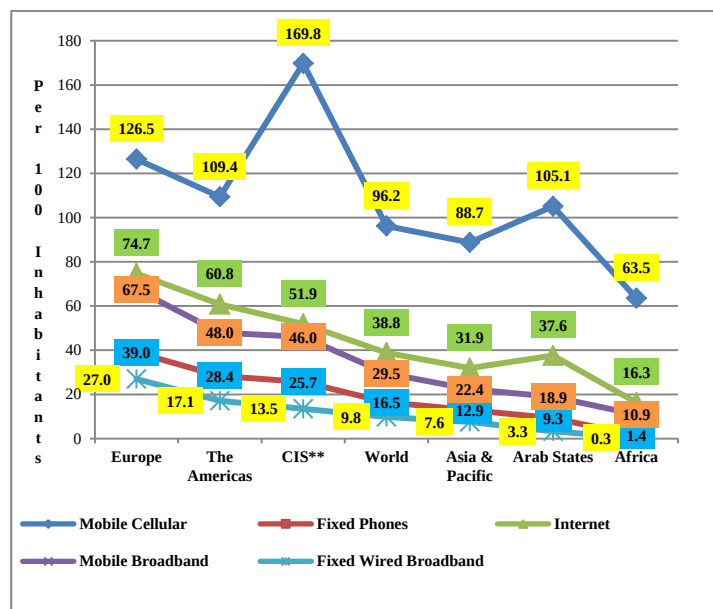


World Population - 7 bn; Global mobile subscription - 6 bn

Mobile Subscription (%): Global - 87%; Developed World -79%; Africa - 63%

Global Population Coverage: 2G - 90%; 3G - 45%

Figure 4: Regional Penetration: Comparative Statistics (2013 Estimates)



Europe, The Americas, CIS and Arab states have achieved a mobile penetration of > 100%

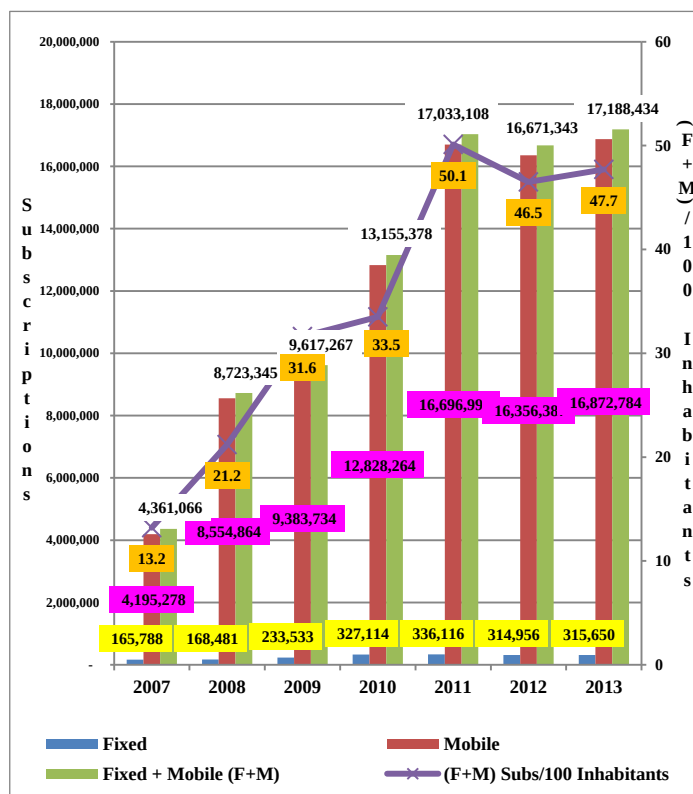
Europe has highest Internet Penetration: 74.7%

Netherlands, Switzerland, Denmark and S. Korea have > 80% internet penetration; Africa: Mobile penetration is about 63.5%

Gabon, South Africa, Namibia, Seychelles have mobile penetration of >100; Africa has lowest ICT indicators

5.0 UGANDA: ICT TRENDS

Figure 5: Fixed and Mobile Subscriptions and Penetration



Population of about 34.5 million

Mobile subscriptions– 17.2m (just about ½ of population)

Due to new services (mobile money, e-payment system for water, electricity, e-banking,) Oct 2010-Dec 2011 registered high mobile subscriptions.

Mobile penetration: 47.7% (lower than African average: 63%)

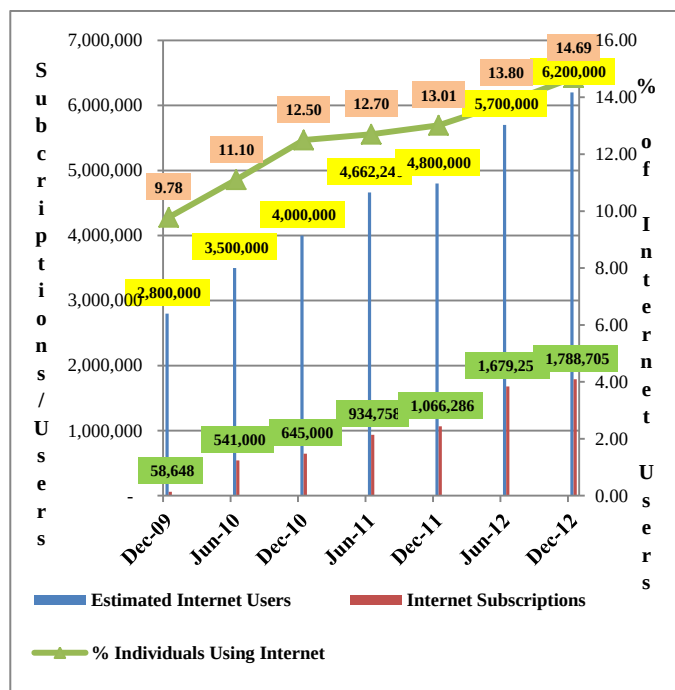
Fixed subscriptions and growth rate are very low

SIM Card registration (2011) and exit of one of the operators from voice reduced subscriptions.

The regulatory requirement has forced some customers to abandon their SIM cards. Further education on the exercise is crucial.

Because of the stiff competition and the reducing profits margins on voice, rather than do everything, some operators have had to re-focus their areas of strength and comparative advantage.

Figure 6: Internet Users and Subscriptions



In 2013 there are about 6.2 m estimated internet users and 1.8 m (5% of population) internet subscriptions

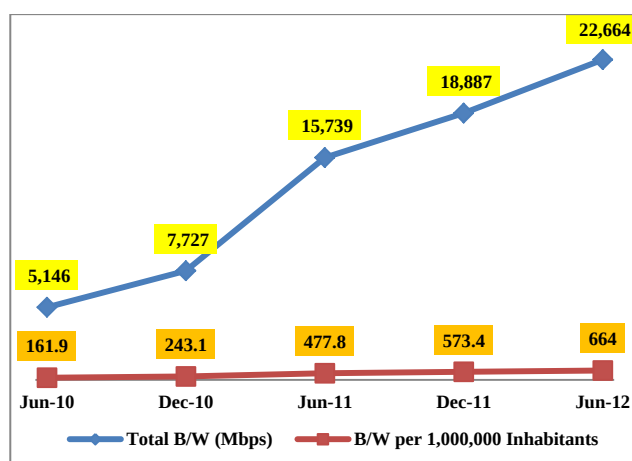
About 14% of population use internet (very low compared to Africa- 16.5%, Europe - 75%, Asia Pacific- 32%, Arab world-38%)

Households Access to Computers:-

Uganda 2% (2009 est.), Kenya 3.45% (2009), Ghana 13.8% (2012), south Africa 21.5% (2011), Rep of Korea 82.3% (2012), UK 87.0% (2012), USA 75.6% 2011)

Market is shifting from being predominantly voice driven to data/internet/mobile broadband and value added services based.

Figure 7: Internet and Bandwidth (Mbps) Growth

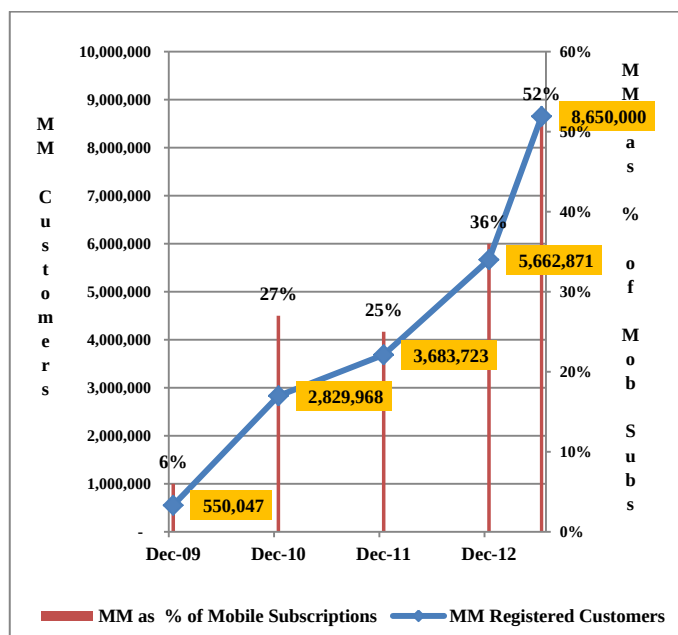


International bandwidth is still very low (total: 22, 664 Mbps)

Bandwidth providers: Seacom, EASSY cable systems, with both landing at Indian Ocean

There are still few international bandwidth providers in the region, making its cost high.

Figure 8: Mobile Money (MM) Growth



Mobile money (MM) is showing a very high growth rate 52% (Dec 2012-June 2013), with now 8,650,000 registered users, representing about 50% of mobile subscriptions.

Because of limited knowledge and non-availability of banking services in the rural areas, MM is set to continue growing.

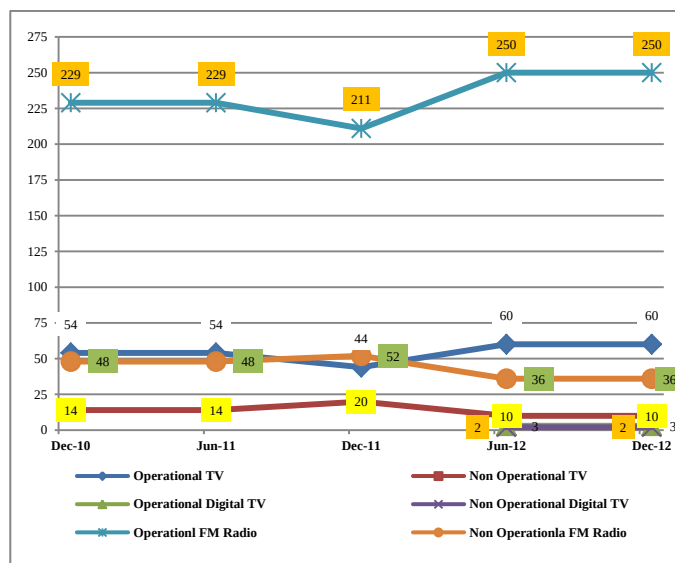
MM is not just used as money transfer application, but it is also used for payment of utilities like water, electricity, and phone services, school fees, etc. This has endeared many people to this service.

June 2012 had 94.5 million transactions valued at US \$ 1.9 bn (4.1% of Uganda's GDP)

There is increased use of other applications like face book, twitter, you tube, video/web browsing, etc.

Other than network broadcasts, the use of traditional sms by individuals is slowing down. This could be a result of growth of new applications like face book, twitter, you tube, etc.

Figure 9: TV and FM Radio Stations



About 300 FM Radio and 80 TV broadcasting licenced have been issued. About 260 and 60 of the FM radio and TV stations are operational; representing more than 80% of the registered stations in each case. One of the main problems facing radio broadcasting is frequency overlap or interference.

Percentage of Households with:-

Radio: Uganda 62.6% (2008), Kenya 74.0% (2009), South Africa 77.2% (2010), Ghana 73.7% (2010)

TV: Uganda 6.4% (2009), Kenya 28.9% (2009), Ghana 51.0% (2010), Rep of Korea 98.8% (2012).

Driven by the regulatory requirement to covert from analogue to digital broadcasting; some digital TV stations opened door in 2012. This is expected to grow as the deadline for conversion approaches in about a year's time (2015).

6.0 CHALLENGES AND PROPOSED ACTIONS

There are a number of challenges faced by the third world that have hindered ICT growth or and penetration. Some of these challenges and the actions required to overcome them include:-++

Poor infrastructure/Legacy network / services – solution is to build new infrastructure and replace the old one

High Investment Cost – Governments needs to give incentives (tax holidays, tax exemption). There is also a need for Financiers / Foreign capital injection and forming partnerships (government, public, private)

Low levels of skills – training in new technologies, support from developers, vendors and regulators.

Fast technology changes-Operators unable to churn networks at a matching rate: technical and project management skills and CAPEX are a necessity.

High poverty and low literacy levels making it hard to adopt services or increase penetration – economic empowerment, education and training.

High costs of services and access devices (computers, smart phones, etc.) - subsidizing services and access devices (operators, government, manufacturers). There is also need to develop user friendly devices that could incorporate some local languages.

Market not yet ready for some services-only a small portion of the market may be ready for the changes – prepare the market through product education/promotions and advertising before introduction

High cost of international bandwidth – new investments negotiate pricing and have long term commitments with international telecom carriers (Seacom, EASSy, etc.)

Poor resource use/allocation: - examples include allocation of frequencies is not properly done, resulting in interference or resource exhaustion. Training and skilling is very important.

Lack of Prioritization – projects that don't promote socio-economic development or of low value are sometimes implemented

High cost of power/energy and low coverage – look for alternative sources of energy like solar, windmills, etc.

Inconsistent and unfriendly Government regulation and policies, these sometimes cause resistance - involvement of stakeholders and review of regulations and policies need to be done where necessary.

7.0 CONCLUSION

The rates of ICT technological development, deployment and adoption are quite very high. While technology development is mainly confined to and led by the developed world deployment cuts across.

In the ICT deployment race, we are running in the same direction, the only difference is the speed. Africa and Uganda in particular, are among the slowest and need to be helped.

Adoption of some of the proposals highlighted in this paper will go a long way in addressing some of the ICT penetration imbalances.

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