MAPPING AND AUDITING OF THE ICT INFRASTRUCTURE IN KENYA AND SOUTH AFRICA AND AMONGST RURAL WOMEN[1]

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Abstract

The aim of this paper is to audit the ICT infrastructure in Kenya and South Africa and also to account for ICT distribution amongst rural women in both countries. The study recognises information audit methodologies such as Informap and uses multiple methods including literature review and the authors knowledge that is largely informed by empirical survey data some of which is available in the public domain (e.g Kwake, Ocholla and Adigun 2006), Kwake (2006a and 2006b etc). The paper provides fresh information on the status of ICTs and its development in the two countries that could be of interest to stakeholders in this domain.

Introduction

Information audit and information mapping are closely interrelated in the sense that they create awareness of an information environment in order that informed decision and interventions are made to improve and develop such environment for the betterment of the lives of the community it serves. Although information audit is simply considered to be a process of information needs analysis, the audit may be defined variably. For example, Robertson(1995:33) consider information audit to be a routine process of gathering, sometimes limited to creating an inventory, of information resources(e.g, hardcopy, on-line services, application soft-ware, individuals with special knowledge and expertise. Booth and Haines (1993:36) consider an information audit to be the systematic examination of information use, resources and flow, with verification by reference to both witnesses and documents. While Thornton (2001:128) is of the opinion that information audit is a mechanism which should allow the mapping of organisations information processes and flows, showing the links between the communication process, the users of information within the organisation, and the means by which information is transferred and used. The purposes of ICT audit, is to determine what the ICT requirements of an organisation or community are and how the ICT can best fulfil the needs, evaluates

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the effectives of an existing ICT system or service to determine effective ways of making their operation and services relevant(cost effective and cost beneficial)(see Stanat,1995:2), to determine what the services population needs and how they are being addressed(see Clair, 1995:22) and to identify the strengths and weaknesses of a system e.g. the attitudes, practices, levels of satisfaction, use, problems, of the service consumer. Ideally, ICTs are created and developed for people. Their main objective, in our view, is to support, supplement or replace human activities or efforts by increasing productivity and performance and providing convenient environment for work and leisure. ICT audit therefore can identify the ICT management goal and objectives of an organisation or service unit, ICT gaps, inconsistencies, or duplication of effort, new ICT products and services, amendments or changes to an existing system, strengths and weaknesses of ICT products and services, assess the attitudes and practices of staff and management with respect to IT products and services, their gathering and distribution and evaluate current ICT channels and identify additions to the system by evaluating: an existing system, current ICT needs, effectiveness of current ICT sources, effectiveness of information distribution and use technology, ICT needs by functional area or department or service community.

The aim of this paper is to audit and map the ICT infrastructure in Kenya and South Africa and also to account for ICT distribution amongst rural women in both countries. This paper is largely informed by literature review involving a survey of newspaper articles, government documents and company reports.

The paper addresses the following objectives:

1.   National policies and strategies on ICT that are in place in Kenya and South Africa
2.   How national policies/ strategies are implemented in Kenya and South Africa
3.   ICT resources and infrastructure that are found in Kenya and South Africa?

2. Mapping and auditing of ICTs in Kenya

2.1   National Information Policies

Kenya has a draft ICT policy. Waema (2006:1) reports that the development of a National ICT Policy has finally made headway after numerous unsuccessful attempts over the past 15 years or so. According to the Ministry of Information and Communications [MoIC] (2006:2), this policy seeks to facilitate sustained economic growth and poverty reduction; promote social justice and equity; mainstream gender in national development; empower the youth and disadvantaged groups; stimulate investment and innovation in ICT; and achieve universal access.*(Pls see insert of draft ICT Policy in the Index).*

The MoIC (2006:4) further indicates that ICT issues are currently considered under various legislations, including "The Science and Technology Act, Cap. 250 of 1977: The Kenya Broadcasting Corporation Act of 1988 and the Kenya Communications Act of 1998", which are inadequate in dealing with issues of convergence, electronic

commerce and e-Government. According to the Ministry, there is need for a comprehensive policy, or legal and regulatory framework to:

(a)   Support ICT development, investment and application;

(b)   Promote competition in the industry where appropriate;

(c)   Ensure affordability and access to ICT nationally;

(d)   Address issues of privacy, e-security, ICT legislation, cyber crimes, ethical and moral conduct, copyrights, intellectual property rights and piracy;

(e)   Support research and development in ICT; and

(f)   Develop an institutional framework for policy development and review.

The MoIC (2006:3) illustrates further that the Government of Kenya first released the "Telecommunications and Postal Sector Policy Guidelines" in 1997. These guidelines paved the way for the enactment of the Kenya Communications Act of 1998, which repealed the Kenya Posts and Telecommunications Act.

2.2   National Gender Policies

Although Kenya can be said to experience relative political stability, especially when compared to neighbouring countries, the World Organisation Against Torture [OMCT] (2003: 12) argues that the Kenyan society is a patriarchal society with widespread discrimination against women and a virtual absence of women in power, especially within socio-economic and political spheres. According to the OMCT, poverty and traditionalism remain serious hurdles facing women's equal rights in Kenya (e.g investing in educating girls than boys, especially at higher levels, issues pertaining to inheritance do not come before the courts because women are often excluded from inheritance settlements).Under the customary law of most ethnic groups, a woman cannot inherit land, and must live on the land as a guest of male relatives by blood or marriage. According to GDRCG (2005:1), Kenya still lacks a guiding and comprehensive gender development policy. For example, there are a number of pending bills to do with women. These include: the Affirmative Action Bill; Criminal Law amendment Bill 2000; National Gender and Development Bill 2000; Equity Bill 2000; Domestic Violence (family protection) Bill 2001; and the Gender and Development Policy Bill 2000.

Some of the nation's most well known women's organizations actively pursuing women's rights are: Maendeleo Ya Wanawake (translated to mean Development of Women); FIDA (Federation of women lawyers); the National Council of Women of Kenya (NCWK); the National Commission on the Status of Women (NCSW); the Education Center in Democracy; and the League of Kenyan women voters.

2.3   ICT services

Telephone Lines and tele-density distribution

Overall, the Computer Society of Kenya (2003) asserts that the number of connected lines in Kenya, had grown from 63,000 in 1977, to well over 300,000 in 2003. This could be translated to mean one telephone per 100 people. Although still a dismal figure, this tele-density fares better than neighbouring countries such as Burundi (0.40), Sudan (0.8), Uganda (0.35), and Tanzania (0.45).

Nonetheless, with only one telephone lines per 1000 people overall, and 77 per 1000 in the capital, Nairobi, Kenya's Gross Domestic Product (GDP) grew by only 1.5% in 2002 (World Bank: 2002). As maintained by the report, as long as limited telephone access continues, the gulf that divides developing nations such as Kenya from the developed world will continue to expand. Mudhai (2004) argues that Kenya has been slow to reform the ICT sector due to monopoly, corruption and under-investment. This has resulted in 200,000 to 300,000 fixed telephone applicants on the waiting list for up to six years. According to the author, this failure rate on 250,000 to 320,000 connected landlines is one of the highest in the world and has resulted in the escalation of charges for mobile phones and the Internet. The author observes, though, that the Government of Kenya (GoK) plans to spend US$ 5.85 billion (Sh444.2 billion) by 2015 on:

- 1.4 million fixed telephone lines in the rural areas. This is translated to mean an average of 5 lines per 100 people, up from 1.6 per 100.

- 2.4 million fixed telephone lines in urban areas. This translates to mean an average of 20 lines by 100, up from 4 per 100.

In a recent move to liberalize and increase competition in the industry, the GoK plans to sell 60% of its shares in Telecom after restructuring the company (Omondi: 2006:1-3).

Following the licensing of ISPs by the Communication Commission of Kenya (CCK) to compete with Telkom Kenya, international calls are now 80% cheaper because of the Voice over Internet Protocol [VoIP] (AllAfrica.com, 2006:1). Today, there are many Internet cyber cafés offering this service for as little as shs 5 per minute (50 South African cents) compared to earlier figures of shs 100 per minute (Rand I0).

Cellular Mobile Telephony

The CCK (2004) states that mobile telephone services in Kenya started in 1992 with the analogue system widely known as the Extended Total Access Communication System (ETACS). Although they were launched commercially in 1993, the prices for mobile devices was exorbitantly high (about Kenya shillings 250,000 = $3125), and therefore unaffordable. Following this, there was a marginal mobile subscriber growth of less than 20,000 during the years 1993-1999.

However, the enactment of the Kenya Communications Act in 1998, led to the introduction of competition in the cellular mobile industry and the entry of Safaricom Limited and KenCell (now Celtel) Communications Limited. This created a phenomenal growth in the number of subscribers, as well as the geographic

expansion of the cellular mobile service in the country. The Ministry of Information and Communications [MoIC] (2006:2) indicates that there were 3 million cellular mobile subscribers by June 2004, translating into a tele-density of 0.75 per hundred inhabitants for fixed lines and 9.75 per hundred inhabitants for mobile services against the world average of 19 and 21 respectively. Other current reports from the Department of Commerce, in the United States of America [DOC – USA] (2006:10), indicate that the mobile subscriber base of both Celtel Kenya and Safaricom escalated to about 4,611,970 around June 2005.

According to the GoK's ICT sector report (2007:7), by the year 2006, this figure had sharply increased to about 8,000,000 subscribers.

Briefly, Safaricom (2004) company was formed in 1997 and is a joint venture between Telkom Kenya and Vodafone. Safari COM is also Kenya's current leading Mobile Telephone Operator. *Kencell (now celtel) (see 2004)* was the second fully private company to be awarded a license to operate in Kenya on GSM technology in January 2000.

2.4 "Old" Technologies/Broadcasting (Television and Radio)

In recent years, Kenya has made significant steps in television and radio in terms of opening the sub-sector to competition and deregulation (CCK: 2001). At the moment, there are a number of stations licensed to broadcast in Nairobi, Mombasa, and in other urban centres. Broadcasting in the rural areas, however, basically remains a preserve of the state-owned Kenya Broadcasting Corporation. Critics have charged that the GoK should fully de-regularize the sector and award licenses to operators, thus allowing them to broadcast freely countrywide. According to the CCK (2001), the full deregulation of the television and radio sub-sectors is therefore an important part of overall ICTs restructuring.

Confirmed reports from the MoIC (2006:2) stipulate that an estimated 60% of the population has access to television, and 90% have access to radio services. The CCK (2001) further confirms that the GoK has licensed 16 television stations and 24 radio stations nationally. The GoK has also amended the Kenya Broadcasting Corporation (KBC) Act by transferring the licensing of entrants into the market from KBC to the Ministry of Tourism and Information.

(See Appendix for a list of the licensed TV and FM stations found in Kenya, courtesy of CCK (2001).

2.5 Telecommunications Systems

According to London and London (1999:234), a telecommunications system is a collection of compatible hardware and software arranged to communicate information from one location to another. Telecommunication systems can transmit text, graphic images, voice, or video information.

Digital fiber-optic trunk lines connect major market centers like Nairobi, Mombasa, Nakuru and Eldoret (CSK, 2003). Kenstream, the digital data network, is also

available in a number of towns. The report indicates that plans are underway to include Kenya as a part of the "Africa one fiber-optic digital network" being put in place to connect countries around the continent. According to the African Policy Monitor [APC] (2006:1), African operators developing the Eastern Africa Submarine Cable System (EASSy) indicate that plans are underway. The laying of this undersea cable is expected to provide a link that encircles Africa with a high capacity fibre optic cable that will provide a more reliable communications network in the second quarter of 2007.

The CSK (2003) also reports that Kenya has one earth station located in the Rift Valley, which is operated by Telkom. The country has no satellites of its own. VSAT services for upload are the monopoly of Telkom, which serves major commercial banks and large corporations with applications such as ATMS and electronic points of sale. The report further confirms that the Communications Commission of Kenya, in early 2002, licensed a second company (Gilat Alldean - Africa Ltd) to provide VSAT services for intra-corporate data communications within the country. Omondi (2006:2) points out that the GoK has thus far issued another eight licenses to Internet gateway operators, 15 local loop operators, and eight public data network operators. *(Please refer to Appendixes a list of Internet gateway operators and loop operators in Kenya)*. Likewise, Digital subscriber leased lines (DSL) are now available from licensed ISPs. Additionally, Telkom has also introduced ISDN services in the country.

Mutula (2002: 466-467), asserts that there are several information networks that exist in Kenya, i.e.: Healthnet Kenya, used for epidemiological data exchange in developing countries; RINAF (Regional Integrated Networks for Africa), which shares data amongst institutions of higher learning within Eastern, Central and Western Africa - Moi University in Eldoret, Infodev/World Bank African Virtual University is hosted by Kenyatta University and links universities in Eastern and Central Africa; and the Kenya Meteorological Office, which links African countries on low speed telex links (x.25 circuits), and is expected to upgrade these links to higher speed digital (64Kbps) TCP/IP based links. Kenya also hosts other international organizations. All these institutions have built in networks that provide links to the outside world, such as Internet access and voice calls.

Wide Area Networks (Internet)

The CSK (2003) confirms that by the year 2003, Internet users stood at around 500,000, including those who access information over 1000 Internet cyber cafes sprawled around the country. Of importance, is that apart from Africa Online, which has a strong foothold in the rural areas, most of the other Internet Service Providers (ISPs) are perched in Nairobi. According to the report, the ISP sector is fairly liberalized, and Kenya is rated fourth behind South Africa, Egypt and Morocco. The Ministry of Information and Communications in Kenya (2006:2) confirms that there are 73 registered ISPs, 16 of which are active, approximately 1,030,000 users, and over 1000 cyber cafes and telephone bureaus as of June 2005. Some of the registered ISPs include: Jawboned, Africa Online, Kenyaweb.com(2002), Insight Technologies Limited(2004), ISP Kenya Limited(see

CSK 2003:1),Nairobi Net Ltd(2001),Swift Global (K) Ltd(2002 was formed in 1995 by Richard Bell and Mohammed Jeanery, and its mission is to provide high quality, reliable Internet and value added services to corporate business in Kenya,Wananchi Online Limited(2002) mission is to provide comprehensive, efficient and reliable Internet and information services to corporate organizations, small to medium-sized enterprises, and individuals using the most up to date technology,UUNET Kenya Ltd(2001) that started operating in 2001, and maintains over 50% of the Internet Bandwidth available in Kenya. In Kenya, UUNET has a customer base of over 500 corporate organisations. Others are:Kenya Data Networks (KDN)(Hoskins 2004) that is a full service, data communications carrier, which was licensed by the Communications Commission of Kenya (CCK) in January 2003 as a public data network operator, Access Kenya(CSK 2003) that is a corporate ISP, and provides only leased lines services specifically designed for the corporate customer, the African Regional Centre for Computing (ARCC)(see ARCC nd) a registered non-profit research organization whose main vision is committed towards spearheading Africa onto the information superhighway, and promoting the use and development of computing and communications technologies.

2.6   Distribution and management of ICTs amongst Kenyan rural women

Most ICT related projects amongst women in the rural areas of Kenya are managed under the auspices of NGOs. According to Esterhuysen (2003:1), African NGOs have been innovative in using ICTs in ways consistent with the available infrastructure and capacity. These include e-mail, mailing lists, and Web database publishing. Most NGOs also make use of wireless technologies, whilst simultaneously integrating new and traditional media. One such organization is the Arid Lands Information Network – Eastern Africa (ALIN-EA), which has joined up with the digital broadcast pioneer, World Space Foundation (WSF), USA, to get information to the remotest parts of Kenya using digital satellite broadcasting. The World Space satellite network is an innovative communication technology that enables people to access information in the remotest villages, even where there are no telephone lines or electricity. It currently operates in four countries - Kenya, Uganda, Tanzania and Ethiopia (Ayieko, 2001:1). In Kenya, ALIN – EA has linked up with organizations such as the Interlink Rural Information Service, an NGO situated in a rural Market centre in Rongo, Kenya. Information ranging from health, HIV/AIDS, environment, agriculture, and micro-enterprise, and conflict resolution, can then be accessed from the multimedia service.

The second NGO worth mentioning is AfriAfya (African Network for Health Knowledge Management and Communication) which was established in 2001 (Jebet, 2003) by seven Kenyan-based health development agencies. AfriAfya seeks to harness information and technology for community health improvement in rural areas and urban slums, through the use of Information Communication Technologies (ICTs). The organization's vision is to harness modern ICTs for community health and for marginalized Kenyan communities. It is observed by this organisation that in many areas lack of health facilities, coupled with inadequate information on preventive and curative measures, has fuelled the spread of diseases. The unchecked spread of HIV/Aids, for instance, is as a result of inadequate information or the misinformation of rural people. In an effort to bridge this information gap, the rural populace have even created myths about various

diseases. HIV/Aids, in some communities, are viewed as a curse. Patients are stigmatized and hence fail to seek medical attention.

AfriAfya partner agencies include Aga Khan Health Services Kenya, Amref Kenya Country Program, Care Kenya and the Christian Health Association of Kenya (Chak). Others are HealthNet Kenya, Plan International, the World Vision and the Ministry of Health. The organisation's field centres are in Kwale, Siaya, Lugulu, Bunyala, and Kibera in Nairobi. It is important to note here that all field centers apply technology to improve health, education, gender equality, the environment, and the economy in marginalized areas. According to Dr. Caroline Kisia (Project Coordinator, Afri-Afya), marginalized communities have benefited from the programs offered through the provision of information on disease contraction and spread, symptoms, prevention and cure.

A third significant project, involving the use of ICTs to communicate and disseminate information, is by "Women's Voices". The women's project is run by ITDG for poor women in Kenya, Peru and Zimbabwe (ITDG, 2005:1). Although women in the project are found living in the urban and not rural slum areas of these towns, it is nonetheless important to take note of the use of ICTs in the communication and dissemination of information. Of particular importance is the need for the women concerned to get their voices heard amongst relevant policy and decision-makers. With poor sanitation and drainage systems, disease is rampant. HIV/AIDS is also no exception. However, with minimal training from ITDG, these women produced videos that captured their challenges, resolves and aspirations. The videos, which feature their poor living conditions, health, alcohol and drug related problems, have been featured on National TV in Kenya, in Africa–wide programs, on German TV, on BBC World Service, on ABC World News USA, and in a New Scientist article. The ITDG project has also won the APC Herbet de Souza "Betinho" Communication Prize in recognition of the use of information and communication technologies for social justice (ITDG, 2005:1-2).

The African Centre for Information and Communication technology ACWICT is another Kenyan NGO committed to the plights of women/girls in ICTs. Constance Obuya, the executive director, isolates "socio-cultural norms" and "non-gender responsive policies as problem areas that need reviewing "(Obuya, 2003:1). To this end, the organization has initiated several projects to promote ICTs among girls/women. Included in these projects is The Horn of Africa Regional Women's Knowledge Network (HAWKNet), which aims to improve the livelihood of women through the use of ICTs. HAWKNet was founded in 2002, and works in Partnership with the United Nations Development Fund for Women (UNIFEM) and the World Banks's Information for development program (INFODEV). HAWKNet is a network of both girls and women from Kenya, Uganda, Tanzania, Ethiopia, Eritrea, Djibouti, Sudan, Somalia and Rwanda. It combines the use of the Internet, radio, and CD-ROM to help women share information amongst them.

The use of ICTs amongst rural women also plays a leading role in distance education. The African Network of Information Technology Experts and Professionals (ANITEP) in Asare (1997:1), observes that "African women long deprived of information, education and training can look to advances in information

technology to bring learning to their doorsteps". According to Ngechu (in Asare: 1997) from the Department of Distance Education in Nairobi, Kenya, distance education particularly helps the disadvantaged communities in rural areas, as it is for those who are looking for a second chance in education. Ngechu further writes that these programs have had a significant impact on women, who select programs according to their various needs. The programs disseminate information on diseases like the deadly malaria, or research findings on agriculture from the University of Nairobi. An overwhelming number of women (70%) have reportedly adopted techniques and methods learnt from these classes.

E-Touch/Telecenters/Cyber cafés are yet another area in which ICTs are gaining popularity amongst rural women in Kenya (Opala, 2004). According to Opala, these centers offer low-cost communication and information services commonly found in low income and rural areas in developing countries, and are used primarily for basic access to phones, faxes, photocopying, word-processing and other activities such as e-mail and Internet access. Today, there are over 200 E-Touch Centres in rural Kenya operated by local entrepreneurs with the support of ISP Africa Online.

An excellent example of how the Internet is being used in the provision of financial, marketing, and other information related services to rural farmers, is the Drumnet Project sponsored by IDRC. This IDRC-sponsored project aims to demonstrate a link between the provision of information and business services to small-scale farmers. (Opala, 2004:2). Opala observes that DrumNet has established rural "Information Kiosks", and provides free information to local small-scale farmers about the current prices of commodities on a daily basis. According to Opala, the use of the Internet to track down prices for the benefit of these farms has been tried successfully in neighboring Uganda and Zambia. In this way, the farmer is linked directly to the producer, thereby increasing his chances of getting better prices and profits.

3   Mapping and auditing of ICTs in South Africa and among rural women

3.1.   National Information Policies

The Government of South Africa (GSA) has placed a strong emphasis on ICT sector development through the implementation of a National ICT strategy, particularly for disadvantaged segments of the society (see also The Academy for Educational Development [AED] n.d.). The report adds that the GSA's Department of Communications began the process of developing legislation in the telecommunications human resource base in 1995 and 1996. The 1995 Green Paper on Telecommunications Policy and the 1996 white Paper on Telecommunications Policy formed the basis of the 1996 Telecommunications Act. Specific initiatives include the Info.com 2025, which addresses issues of policy, infrastructure, human capacity and local content within ICT industries. Info.com 2025 supports IT related projects, and also seeks to "empower people in the way they work, live and play, and make South Africa globally competitive". A major objective is one that seeks "to facilitate and promote education and training through the use of telecommunications technologies." Other programs include the establishment of

community information centers, public information terminals, Internet connectivity in schools, and training for teachers.

The South African Information Technology Industry Strategy's (SAITIS) focus is on building infrastructure, especially within secondary towns designated as export zones, for both ICT and non-ICT products and services. Through the establishment of the Universal Service Fund, both wire line and wireless service providers have extensive obligations to provide access to previously disadvantaged regions with low income and geographic complexity (SAITIS: 2000). South Africa has also been involved in the Southern African and Far East (SAFE) initiative to promote the connectivity of all African countries through regional backbones that do not leave the continent. According to the report, it is hoped that SAFE will reduce the cost of calls that are currently routed through Europe (SouthAfrica.info:2006).

The Academy for Educational Development [AED] (n.d: 4) denotes that other initiatives by the GSA are the Technology Enhanced Learning Initiative (TELI), which aims to support curriculum development at grade eight level, offer vocational education, develop information literacy courses for use in schools, and initiate community centers and industry based training sites. Yet another government initiative is School Net South Africa, an organization devoted to expanding Internet use in South African Schools. The AED contends that School Net SA is one of 25 School Nets in Africa, and apart from the support that it receives from the GSA's Department of Education; it also receives support from the private sector, i.e. Microsoft, Cisco, Nortek, Sun, #Com etc. A few activities conducted by this initiative are: Internet connectivity, human resource development, advocacy and marketing.

In another survey conducted by Accenture, Markle and UNDP (2001), the GSA introduced three important taskforces to address the deployment of ICT as an enabler of social and economic development. These include:

(i)   The Presidential International Task Force on Information Society and Development (which is to focus mainly on global ICT markets)

(ii)   The National IT Task Force (which will deal with the issue of "brain drain" and the deployment of ICT initiatives locally) and

(iii)   The IT Council (whose aim is to handle local and provisional government IT functions)

In addition, the government announced the establishment of the Investment Council, which focuses on positioning South Africa's imports and exports globally and on generating foreign direct investment through international collaborations.

Accenture, Markle and UNDP (2001) further assert that the Information and Communication Technology (ICT) policy in South Africa now incorporates telecommunications and e-commerce. While these are discrete policy and legislative processes, the two are intertwined within the joint national strategies of equitable development and economic growth.

Likewise, Research ICT Africa (2004) denotes that the telecommunication sector in South Africa has been in a process of "managed liberalization" since the second phase of reforms in this sector were passed in the Telecommunications Amendment Act of 2001. According to the Government Communication Information System [GCIS] (2006/7:133), this act has enabled the Department of Communication in South Africa to liberalize the telecommunications market, increase competition, and stimulate the sector in order to bring down the cost of communications. The GCIS further reports that section 40 of this act requires that serviced area licenses provide telecommunications services, voice-over internet protocol, fixed mobile services, and public pay telephones. Mobile operators are also allowed to use any fixed lines for providing both voice and data transmission services.

Following this, the Mail&Guardian (2007) reports that South Africa's Second National Operator (SNO) has now been licensed to operate a publicly switched telephone network. According to the report, South Africa's SNO, namely Neotel, was finally launched in August 2006, and is set to help reduce the high telecommunications costs in South Africa. According to the report, Neotel has secured access to the relevant Eskom and Transnet Infrastructure, including 10,000km of optic fiber backbone, within metros and across the country.

3.2 Universal Access Policy/Universal Service Agency [USA] - currently known as the Universal Service and Access Agency of South Africa (USAASA).

The GCIS (2005/6:133-134) reports that the USA was launched in 1997 and is a statutory body whose objectives include advising the minister on ways to bring about universal access and service, and coordinating initiatives by service providers such as Telkom, Vodacom, Mobile Telephone Network (MTN) and Cell C . The USA also works with Community Based Organizations (CBO's), Non-Governmental Organizations (NGOs), donor organizations and businesses. The report states that the Universal Service Fund is used to reinforce the development of infrastructure in under-serviced communities.

Current reports from the USA (2006) indicate that while the USA will now be known as the Universal Service and Access Agency of South Africa (USAASA), the Universal Service Fund will be known as the Universal Service and Access Fund (USAF). By the same token, the Department of Communications in South Africa (2006) illustrates that the mandate of the Universal Service and Access Agency is to promote, facilitate and monitor the achievement of universal service and access in under-serviced areas, with respect to communications, and also to manage the Universal Service Fund.

All–in–all, the two tables over the next four pages give summaries of South African national goals as they relate to the Universal Access and National ICT Policy.

According to Parkinson (2005:37-38), the key policies guiding universal access are the Telecommunications White Paper of 1996, the Telecommunications Act of 1996

and the Telecommunications Act Amendment of 2001. The author further states that the 1996 Act set up the regulatory body for telecommunications (South African Telecommunications Regulatory Authority - SATRA), which in 2000 merged with the broadcasting regulator (Independent Broadcasting Authority - IBA) to form the Independent Communications Authority of South Africa (ICASA).

In Table 1, Parkinson (2005:35) draws on documents and public statements from leading government officials and summarizes the key policy intentions regarding universal access in South Africa.

In Table 2, Audenhove (2003:135) explains that the table gives an overview of the most important policy initiatives as they relate to ICTs and the information society. The table is organised according to areas of developmental strategy; infrastructure; content and applications and skills; and institutional capacity. Different policy processes impacting on and relating to the information society come from a wide variety of sectors and different departments.

Table 1. Summary of South African national policy goals related to universal access		
(Source: Parkinson, S. 2005: 35)		
Goal	*Evidence/where stated (not exhaustive)*	*Implementation mechanisms*
Universal access to telecom (and broadcasting) service, redressing historic inequities	Telecommunications Act 1996, revised Act 2001, mandate of Parliamentary Portfolio Committee on Communications	Regulatory authority (ICASA), licensing agreements, Universal Service Agency, Universal Service Fund
Delivery of government services including social services (e-health, e-education, etc.)	Eg, Department of Education White Paper on E-education (2003), research commissioned by PNC ISAD	Various government departments, GCIS, PNC ISAD, Universal Service Agency under 2001 mandate
Improvement of communication between government and citizens	RDP 1994	Various government departments co-ordinated by GCIS (own services)
Democratization, diversification of media and expression	RDP 1994, MDDA Act 2002	DoC, MDDA, Department of Arts and Culture
Supporting local development through information provision	Mandates of DoC, Universal Service Agency	DoC, GCIS, Universal Service Agency, various government departments
Supporting SMMEs and job development	ICT Economic Empowerment Charter (2004 in progress)	Department of Trade and Industry, ISETT SETA, Universal Service Agency under 2001 mandate
Creating a South African information society	Presidential speeches, e.g 2001 State of the Nation address, Telecommunications White Paper 1996	Various: DoC, Universal Service Agency, Department of Arts and Culture, presidential task forces

Table 2 Policy initiatives and actors
Source: Audenhove (2003:135).*Towards an integrated information society policy in South Africa*

Policy documents or initiatives	Description of the programme or part of the programme	Responsible department or institution
DEVELOPMENTAL STRATEGY **(economy, industry, technology and innovation)**		
White Paper on Science and Technology (November 1996)	Science and technology policy geared at innovation and growth	Arts, Culture, Science & Technology
Foresight (June 1999)	Prospective study directed at a long-term economic and industrial growth strategy	Arts, Culture, Science and Technology
South African Information Technology Industry (IT) Strategy (2000)	Industrial strategy for the IT sector	Trade and Industry
Growth, Employment and Reconstruction (June 1996)	Neo-liberal policy framework for economic development	Presidential Office and Department of Economy
e-commerce	Overall policy to stimulate and regulate electronic commerce	Communications
INFRASTRUCTURE (networks and infrastructure)		
Telecommunications Act (November 1996)	Establishes a new policy framework for telecommunications	Communications
Telkom	Under the new framework responsible for network extension and universal service	Communications (as major shareholder)

Satra	Responsible for regulating the telecommunications sector	Communications
USA	Responsible for the promotion of universal service and access. De facto responsible for the implementation of telecentres	Communications
GCIS	Responsible for the implementation of MPCC's and the coordination of telecentre initiatives	President
Technology-enhanced Learning Strategy (May 1997)	Strategy to translate the earlier TELI in concrete initiatives and projects	Education
Centre for Educational Technology and Distance Education (1997)	Centre responsible for policy preparation in respect to distance education and technology in education	Education
Schoolnet SA (November 1997)	Infrastructure in the educational sector	Education, communication, Trade and Industry
State Information Technology Agency	New structure responsible for IT in government. Should lead to a better integration of systems and networks	Public Service and Administration
CONTENT AND APPLICATIONS		
Technology-enhanced Learning Strategy (May 1997)	Strategy to translate the earlier TELI in concrete initiatives and projects	Education
GCIS	Responsible for government communication and development communication	President
White Paper on Broadcasting Policy (May 1998)	New policy framework for the audiovisual	Communications

Broadcasting Act (April 1999)	Legislation reforming the audiovisual sector	Communications
Schoolnet SA (November 1997)	ICT applications for the educational sector	Education, Communications, Trade and Industry
SKILLS		
Educational Policy in general	In as far as it provides people with the right skills to function in the information society	Education
National Qualifications Framework (from 1996)	Qualifications and certification system for the education system	South African Qualifications Authority
INSTITUTIONAL CAPACITY		
White Paper on Public Service (November 1995)	Reforms the old apartheid structures in one public service with one public administration	Public Service and Administration
Educational and vocational policy in general	In as far as it provide people with broad skills to function in society and in modern institutions and organisations	Education, Labour
Employment Equity Act (October 1998)	Sets out the policy framework for to support disadvantaged groups in employment	Labour

In spite of all these efforts on ICT policy formulation, Parkinson (2005:34) reiterates that the main problem with the act is that it has overlaps and does not clearly establish the roles and responsibilities of the agency and the regulator. Audenhove (2003:6), on the other hand, retorts that South Africa still lacks a "formal vision of the information society in the form of an integrated policy or policy document", as different departments drive policy processes. According to Audenhove (2003:135), there is a need to coordinate this broad body of different policy areas and integrate them with broader macroeconomic and developmental policies.

3.3 National gender policies

According to the Academy for Educational Development [AED] (n.d:4), the South African Government is committed towards gender equity in IT and "creating an enabling environment for South African women to participate in IT training programs". The Commission on Gender Equality, the National Gender Forum housed in the Department of Justice, and the Office on the Status of Women in the Office of the President, are examples of government efforts that have been initiated for the sake of emancipating women. Others include initiatives in the telecommunications sector, embodied in the Department of Communications', Gender, Youth and Disability Desk. The aim is: "to integrate gender, youth and disability sensitive perspectives in all departmental programs and policies… The

Department will also ensure that empowerment strategies, policies and legislation designed to ensure more meaningful participation of historically disadvantaged citizens, are sensitive to biases which exclude equal participation in the communications sector of the economy" (AED, n.d:5).

3.4 ICT services

Telephones/Telephone Density

Research ICT Africa (2004) reports that the telecommunications sector in South Africa is characterized by relatively high retail prices, super profits, job losses, licensing delays, and deadlocks with minimal new foreign investments. Nevertheless, according to the DoC [USA] (2006:21), South Africa's telephone system is the best developed and most sophisticated on the African continent. The report explains that domestic systems consist of carrier-equipped open-wire lines, co-axial cables, microwave radio relay links, fiber-optic cables, radiotelephone communication stations and wireless local loops. Currently, Telkom has well over five million main fixed lines in use.

Cellular Mobile Telephony

The cellular industry in South Africa has witnessed tremendous growth over the years, and currently there are four mobile operators, namely: Vodacom, MTN, Cell C and VirginMobile. *Vodacom* initially started commercial operations in 1994, with a modest subscriber base of 50,000 (Cellular Online, 2004). These figures have rapidly soared, and in May 2006, Vodacom connected its 20 millionth subscriber in South Africa (GCIS, 2006/7:137). It is the market leader in South Africa and has more than 5700 base stations around the country, ensuring in excess of 95% of all South Africans are within the coverage area of its impressive cellular network. As at 2004, Vodacom had deployed more than 24,767 community services telephones in previously under-serviced areas, compared to the license obligations of 22,000. M *TN*

was awarded a license in 1993 and provides access to 94.5% of South Africa's population (MTN South Africa, 2005). According to GCIS (2006/7:137), MTN International offers cellular network access and associated services through its subsidiaries and joint ventures in Nigeria, Cameroon, Uganda, Rwanda and Swaziland. Currently, Allafrica.com (2007) records hold that by May 2007, MTN South Africa had a subscriber base of 13,030,000 million. *Cell C* consortium started its operations in 2001, and as of 2004, had 3 million users. Of the 1.9 million active users, some 84 percent - or 1.6 million of its subscribers - were prepaid users, and 16 percent contract (Cellular Online, 2004). Current reports from Moneyweb (2007) indicate that the Cell C subscriber base now stands at 3.3m. The fourth mobile phone service is *VirginMobile (see 2007) that* is a virtual network operator that was launched in South Africa in June 2006. Mobile Africa reports that the cellular company uses Cell C network infrastructure to provide cellular communications services to subscribers in South Africa. Virgin Mobile offers voicemail, international roaming, sms, mms, internet caller ID, and flexible billing.

3.5. "Old" Technologies/Broadcasting (Radio and TV)

3.5.1.Radio

According to Erasmus (2005:1), South Africa's broadcasting history can be traced back to the early twenties, when South African Railways made its first wireless broadcast in Johannesburg. This led to the first radio station, "JB Calling", which was transmitted by the Associated Scientific & Technical Club of Johannesburg, then the Durban Pietermaritzburg Calling radio service, transmitted by the Durban Corporation, and the "Cape Town Calling" radio service, transmitted by the Cape Peninsula Publicity Association. However, an untimely onset of financial constraints led to the dissolution of all three radio services and the formation of the African Broadcasting Company (ABC) in 1927 by the Schlesinger Organization. The author narrates that following further investigations, the South African Parliament, under Act 22 of 1936, formed the South African Broadcasting Corporation (SABC).

Public Broadcast Services include:

Mishkind (2006) illustrates that public broadcast services are owned by SABC and are transmitted in indigenous languages. They include:

(i)   SAFM (Based at SABC, JHB) - National English program

(ii)   RSG (in Afrikaans Radio Sonder Grense) - National Afrikaans   programme

(iii)   Ukhozi FM (at SABC, Durban) - Regional Zulu programme

(iv) UMhlobo Wenene (at SABC, Port Elizabeth) - National Xhosa   programme

(v)   Radio 2000 (in JHB) - National music and entertainment station

(vi)   Ligwalagwala FM (at SABC, Nelspruit) - Regional Tsonga Programme

(vii)   Munghana Lonene (at SABC, Polokwane) - Regional Tsonga Programme

(viii)   Thobela FM (at SABC, Polokwane) - Regional Lebowa programme

(ix)   Phalapala FM (at SABC, Polokwane) - Regional Venda programme

(x)   Lotus FM (at SABC, Durban) - National Indian programme.

On the whole, the South African Broadcasting Corporation (SABC) has 18 radio stations that broadcast in 13 languages. Well over 19 million adults in South Africa tune into these stations (DoC-SA, 2005).

3.5.2   Television
Four major television channels can be identified. First is SABC. GCIS (2006/7:141-142) states that the South African Broadcasting Corporation (SABC) has three free-to-air channels, which broadcast in 11 languages. According to the report, these

channels reach a daily audience of almost 18 million people, and have more than four million licensed television households. Second, is ETV (see e.t.v. nd) that is South Africa's first private free-to-air television channel, and was launched in 1998? The e.tv channel broadcasts a full-spectrum programming service to 78% of South Africa's population, and is owned by the Black Empowerment Group, Hosken Consolidated Investments Limited and Venfin Limited. Third is the *M-Net.* GCIS (2006/7:142) illustrate that M-Net is South Africa's first private subscription television service, and was launched in 1986. M-Net channels are delivered through analogue terrestrial and digital satellite distribution, and offer movies, sport, children's programmes, international and local series, and local reality shows. The fourth one in this category is *Satellite broadcasting.* MultiChoice Africa [MCA] was formed in 1995 to manage the subscriber services of its sister company, M-Net, and became the first company on the continent to offer digital satellite broadcasting. Operations include subscriber-management services and digital satellite television platforms, which broadcast 55 video and 48 audio channels, 24 hours daily (GCIS 2006/7:142).

3.6   Telecommunications Systems

Satellite links

Milne, et al (2004:1) reports that Stellenbosch University developed the first successful micro-satellite program, SunSat (Stellenbosch University Satellite). SunSat 1 was South Africa's first Satellite to reach orbit and was launched in February, 1999. The authors state that South Africa's second satellite - Sunsat - 2004 (again from the University of Stellenbosch) was launched late in 2005. South Africa's second Satellite, named "Sumbandila" (meaning "lead the way"), is an 80-Kilogram micro-satellite and is expected to orbit the earth at a height of 500-kilometers (Southafrica.info 2006:2). Accordingly, this satellite will be used to support, monitor and manage disasters such as floods, oil spills and fires. Coming to *Copper/ fiber optic cable, i*n a supplementary report to the International Steering Committee [ISSC], the Square Kilometer Array (SKA) (2003:48) illustrates that Telkom has an extensive optical fiber cable network deployed in South Africa, which also penetrates into the rural areas.By the same token, Telkom SA (2006:2) reports on the SAT3/WASC (Southern Africa-Western Africa Submarine Cable) which is a 15000 Km high performance fiber optic cable linking Europe with South Africa and a number of countries in the West African coastline. Telkom SA (2006:2) reports that this project will bring the power of high speed connectivity to Africa, sophisticated communications, paperless faxing, access to the world's research facilities, and access to news almost instantaneously. Furthermore, businesses will be able to engage in e-commerce, open up new markets, expand distribution, and reach various buyers, suppliers and other service providers.

Wide area networks [WANs e.g. the Internet]

The Online Publishers' Association (OPA) and the international ratings company Nielsen/Net ratings, in Government Communications and Information Systems [GCIS] (2006/2007:135), indicate that South African websites are attracting an

increasing number of local and international consumers. By June 2006, readership or unique browser figures had reached 4.6 million, and page impressions had hit 115 million(*Please see the list of licensed ISPs found in South Africa, courtesy of the Internet Service Provider Association of South Africa [ISP] (2006) in the index.*)

3.7.   Equipment

(Network Base stations)

According to Cellular Statistics (2004) more than 5500 Vodacom base stations provide coverage to 60 % of the geographical area of the country.

3.8   Distribution and management of ICTs amongst South African rural women

Women'sNet (2006) reports that Women's Net was launched in March 1998, as a joint initiative between the South African Non-Governmental Organisation Network (SANGONET) and the Commission on Gender Equality (CGE). According to Women'sNet, Sangonet was established as WorkNet in 1987 to provide regional electronic information and communications networks to NGOs in South Africa. In 1993, Sangonet's scope widened to include development and human rights workers, and the provision of an accessible and affordable electronic communications infrastructure, including the provision of information. Following the election of a democratically elected government, the Commission on Gender Equality (CGE) and [Sangonet] initiated Women'sNet in 1998.

Women'sNet (2006) exists primarily to serve women's information needs in a user-friendly way and therefore to: make ICT technology accessible to women; change the flow of information from North-South, to South-South; empower and train women in the use of electronic media; and for women's economic empowerment; among others. Women's Net prioritizes women who do not have access to technology, especially rural women, NGO's and Community based organizations, self employed women, and government information workers.

Women's Net (2006:2) further illustrates that its priorities include: making ICTs accessible to women, particularly disadvantaged women; providing gender-sensitive training and support in the strategic use of the internet; linking projects, people, tools and resources through the empowerment and support of technology planning processes within women's civil society organisations, and through exploration and awareness raising of free and open source software solutions (FOSS); creating a platform for women's voices and issues through the Women's Net website and through capacity development; facilitating the dissemination of information in formats accessible to women who are not directly linked to the Internet; facilitating collaborative website development; and the strengthening of women's networks.

4. Conclusions and recommendations
 Evidently, both Kenya and South Africa are actively involved in creating and developing information and communication technology infrastructure for

improvement of ICT access and use. South Africa seem to have a stronger edge in infrastructural, access and use base than Kenya owing largely to its well developed infrastructure in the past. In Kenya, Mudhai (2004) observes, the legal and structural changes that separated the regulatory and operational services of the Kenyan ICT strategy in 1998 and 1999 have now been effected. These policies have opened a new chapter for the telecommunications, radio and postal sectors, with the establishment of Telkom Kenya, the Communications Commission of Kenya (CCK) and the Postal Corporation of Kenya. Equally, and as noted by Waema (2006:1), Kenya has a draft National ICT Policy. This policy covers information technology, telecommunications, post, broadcasting and the radio spectrum. Although this policy has still not been enacted into an act of Parliament or a law, it provides a strong framework on which to develop the ICT sector in the country. Unlike Kenya, the GSA's Department of communication began the process of developing legislation in the telecommunications sector in 1995 and 1996. The 1995 Green Paper on Telecommunications Policy and the 1996 White Paper on Telecommunications Policy formed the basis for the 1996 Telecommunications Act.

Notably, national policies and strategies on ICT in South Africa are implemented by a cross section of government departments/institutions that range from Arts and Culture; Science and Technology; Trade and Industry; Communications; Education; and the Presidents office. Once again, according to Audenhove (2003:148), what appears to be lacking in South Africa is a central institution that can steer initiatives and coordinate policy. The weaknesses of South African ICT policy are worth analysing for improving future implementation of such policies for example in Kenya. For example, has the policy increased competition and liberalised ICT investment, access and use? Has it accelerated the penetration of services into the marginalised or under serviced areas such as the rural areas? Has the policy streamlined the regulatory framework?

Access to ICT by women depends largely on the level of access to ICT among the marginalised or under serviced communities and how ICT policy alluded to earlier address and implements this. Among the strategies, for example, Marcelle (2002:3) calls for the empowerment of women through the enhancement of skills, knowledge, and access to ICTs. This includes making improvements in access and promoting initiatives that include rural women and women in the informal sector. In addition, women could take full advantage of the opportunities offered by information technology if more education at all levels, from basic literacy through to scientific and technological education is offered. Women are also not likely to benefit equitably from ICT projects unless special efforts are made to identify their situation and needs and effective action is taken to incorporate their active participation in project implementation and development. For example, women not only have less access to the technology itself, but are also financially limited and have less time to learn and use the technology. Women are also absent from decision-making positions in information technology and in developing countries. Whether the increasing employment of women in decision making positions in South Africa contributes, in any way, to rapid roll out of ICT among the deprived communities is worth interrogation.

Conclusively, gender considerations are crucial from the beginning of project design, i.e. the planning stages of the project under consideration. Some of these include: (i) the need for gender–disaggregated data on projects, especially those involving training; (ii) the need to correctly assess skills levels before training, as more women than men may have low skill levels in information technology, and this would necessitate adjusting training accordingly; (iii) the need to take into account gender specific cultural constraints, such as women's family responsibilities and/or difficulty in attending evening training sessions; (iv) and the need for post training follow-ups to ensure access, combat cultural constraints and promote skills retention.

Apart from providing women with a platform that enables participation in the decisions taken regarding their lives, there is a need to: ensure that correct and accurate information is availed to women at all times; expose rural women, through the use of ICTs, to what other women are doing in other parts of the world/country in similar settings/situations; build individual capacities through skills-enhancement programs; and provide seed funds for initiating projects. Interrogating the strengths and weaknesses of existing ICT infrastructure, policies/legislations, management and access within and between the countries is important for improving access and use.

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