

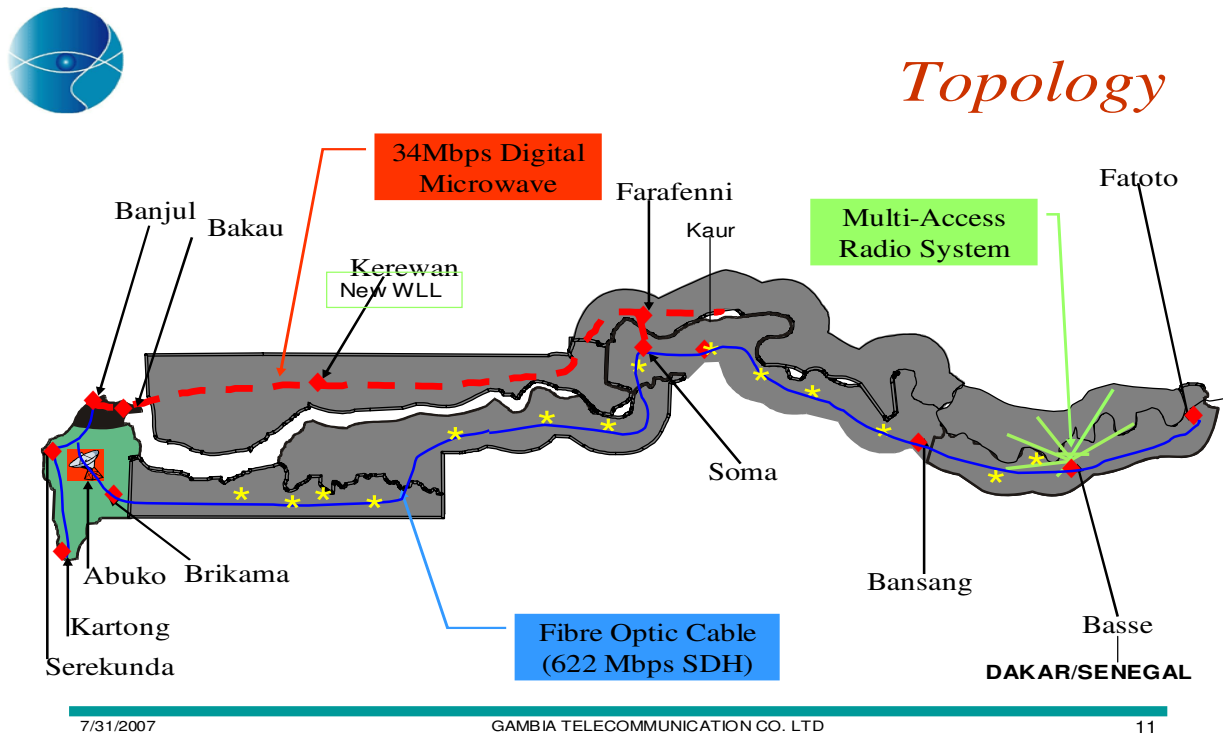
CHAPTER 3 : ICT INFRASTRUCTURES

3.1 Production Infrastructure: National communication & Telecommunications link

3.1.1 Telecommunications link

The country has a fixed line telephone penetration rate of 3.1%. The penetration rate of 6% in urban areas and about 1% in the rural areas. Combined with mobile phones there is a total penetration rate increased from 18.35% in 2005 to 21.6% in 2006. Gambia Telecommunication Company (GAMTEL) has laid a fibre optic cable on the south bank of the river Gambia that run across the country.

Figure 1: Topology of Telecommunication Links



In the mobile phone area there are two mobile phone operators in the Gambia – GAMCEL and AFRICEL – with a total customer base 430,000 (2006). In mobile phone sector new expansion were also in plan.

3.1.2 Telecentres

Public telephone access like telecentres is very much wide spread in Banjul, Kanifing municipality and parts of the western region. A number of similar Telecentres exist in the rural areas making telephone service accessible to the general public in almost all parts of the country, which is consistent with ITU guideline.

3.1.3 Public Key Infrastructure (PKI)

There is a need setting up in the Gambia a public key infrastructure the extension of the network and the creation of a National Certification Authority. Also proposed, was the establishing of State services on-line and the development of a legislative and regulatory framework required for the use of ICT within a secured environment. The PKI is a framework of policies for the management of services and software using a public key cryptography and digital signatures for electronic transactions and exchange of information to enhance confidentiality and security.

3.1.4 Communication link

Although ICTs may be meeting the needs of individuals and households in products or services delivered to them, for most individuals and households, even in most developed countries, the direct application of ICT is still relatively limited. There is only one public television station in The Gambia and no private TV stations. Alternative satellite and cable television viewing are also available. There are also 5 private radio stations and one public and three community radio station. Households can take advantage of the available information through radio and television programmes, to increase agricultural productivity, marketing facilities, trading opportunities and thereby reduce on household poverty.

3.2 Projects for ICT Development in The Gambia

3.2.1 AU-E-Network Project

This project is financed by Government of India through the African Union Commission with the objectives of linking the referral hospital (RVTH and Bansang hospitals) with

medical centres in India and it also aimed at linking the University of the Gambia (UTG) with the Indian Universities.

The above objectives could be achieved through the provision of online medical and educational services, access to advance education and medical services abroad and to provide the facilities and linkages for broadband video conferencing.

3.2.2 Construction of Technology Park

The construction of Technology Park, a major component of Silicon Valley Initiative, is aimed at attracting multinational ICT businesses into the country and to develop other ICT related initiative. This project is being funded and supported by governments of Egypt and Taiwan. Apart from the signing of an MOU with the government of Egypt, the government was able locate a project sites and now in the process carrying a feasibility study.

3.2.3 The Biometric Project

This involves electronic processing of National ID, Passports and personal registration documents and authentication by upgrading those documents for better security and efficient service delivery. The initiative is to be contracted to Biometrics International Group (BIG) which intends to build, operate and later transfer the project. Great achievement was made in the finalization of agreement and preparation of a cabinet paper requesting approval to sign contract with BIGs initiative.

3.2.4 The e-Government Project

E-Government strategy formulation and implementation supported by ECA is mainly aimed at providing effective and efficient public service delivery system for the civil servants and the general public. The implementation of the e-Government strategy by 2005 called for the establishment of an e-Government Directorate that will be responsible for the overseeing the e-Government programmes, creation of government websites in all the Department of State (DoS) and the implementation of e-Government pilot project by end of December 2010. Process has been made in the identification of focal points, hosting of DNS by GAMTEL under .gov.gm domain and the piloting of government email services e.g. @doscit.gov.gm.

However, constraints in funding and lack of adequate equipment are major bottle neck implementation of the project. Government have made advance efforts in introduce biometric-electronic processing of national ID, passport and other national document ect.

3.2.5 ICT4D Project

This is an ECA supported initiatives aimed at increasing awareness and understanding of the knowledge of ICT as a tool for development focusing on the e-Government and NICI frameworks. ICT development campaign is been done through broadcasting electronic and print media.

3.2.6 NICI Policy and Plans Development

The development and the formulation of NICI Policy and Plans was mainly aimed at recognising the areas where ICT would contribute to the attainment of the overall objectives of the Vision 2020 and the PRSP document under four strategic issues as thus:

- (a) Enhancing the Productive Capacity of the Poor;
- (b) Enhancing Access to and the Performance of Social Services;
- (c) Local Level Capacity Building and;
- (d) Promoting Participatory Communications Processes.

The NICI policy formulation and development process was carried out in two phases:

- Phase 1 calls for consultative meetings of NICI Core Group, IT business houses to record their view on NICI policy; academia group such as University of the Gambia, Management Development Institute (MDI); Gambia Technical Training Institute (GTTI), etc. ; regulatory bodies such as The Gambia Divestiture Agency (GDA) and the Public Utilities Regulatory Authority (PURA) ; other Government Parastatal; civil society organizations, youth organization; media houses; local government representatives.
- Phase 2 involves series of validation of the proposed NICI pillars; sectoral objectives; ICT mediated specific goals and challenges. The NICI implementation is now at an advance stage developing plan base on the action plan.

3.2.7 Telecommunication Bill

A draft Telecommunication bill has been formulated. The purpose of the bill is to create a legal and enabling environment to improve the quality and service delivery of telecommunication services. The bill when it becomes law will clearly delineate the complementary rolls of various stakeholders.

A draft copy of the bill was circulated for review and comments. Final comment would be incorporated by the Legal Drafts person at the Attorney General's Chambers and Telecoms Bill would be tabled in parliament for enactment in December 2007.

3.2.8 GAMTEL's ICT Development Projects; 2005-2006

Gamtel has, over the years, pursued policies that have allowed it to provide relevant and affordable services to the people of Gambia whilst at the same time grow revenue. By carefully balancing these two major objectives, Gamtel has been able to undertake projects with enormous socio-economic benefits to our people throughout the country without jeopardising its sustainability. Gamtel's current global expansion strategy aims to rehabilitate, expand and consolidate its existing copper-based urban networks as well as explore recent break-through in wireless technologies to bring communications facilities to over 70% of The Gambian population, most of whom are rural folks engaged in subsistence farming. These are similar strategies that have been successfully used in Asia to improve office and business efficiency as well as give rural schools access to other learning centres and resources, facilitate hospital referrals for rural health centres as well as give farmers access to relevant market information and best agricultural practices. In the light of the above considerations, Gamtel between 2003 and now, embarked on the following projects:

3.2.8.1 Crash Programme

The main objective of this project is to secure Gamtel's networks located within the Greater Banjul Area (GBA) through the deployment of a self-healing fibre-optic cable ring network and connecting the main catchment areas from SK exchange through 5K market, Bundung exchange, Abuko Earth Station, Yundum Exchange, Banjul International Airport, Yaram Bamba Estate, Nemasu, Wellingara, Brussubi, Kotu and back to Serekunda. In addition to

this, two CNE5 of 512 line capacity each were to be deployed in Brufut and Garawol respectively; and a 3,500 line copper network created around the Serekunda market and Senegambia areas.

3.2.8.2 Alcatel Stage 1 Project

The main objective of this project is to expand the switching, control and transmission matrix of Banjul and Serekunda exchanges which had been exhausted. The inter-exchange links to cater for increased inter-exchange traffic needed to be increased to cater for increased rural and mobile traffic. The V5.2 interfaces at both Banjul and Serekunda exchanges needed upgrading and new software loaded to enable them to connect 5,000 rural wireless customers each. Switching capacity of both exchanges needed expanding to allow for the connection of up to 25,000 new customers. A 256 concentrator was to be deployed to provide communication services to Samba Kunda and YBK. Project successfully implemented and working.

3.2.8.3 Airspan Project

The main objective of the Airspan project was to replace a similar, but obsolete, wireless local loop system, the IRT 2000, as well as prevent the imminent collapse of the entire rural telephone network in the North Bank Division due to the obsolescence of the radio network in the area. The scope of the project was later increased to provide telephone services to about 800 villages throughout the country.

The Airspan project was successfully deployed and all the vulnerable networks in more than 36 villages that had obsolete radio equipment were successfully transferred onto it without much of a problem. Its expansion into other parts of the country is to bridge the access gap between the urban and rural areas of the country. Thus far, about 266 villages are now connected to the Airspan network and the recent receipt of 200 Subscriber Terminal (ST) kits that are being distributed to the different Regional Managers would allow the connection of another 200 villages.

3.2.8.4 CDMA Pilot Project

The main objective of this pilot project was to see how best it would help in reducing the ever increasing demand for telephones through the use of wireless access technologies. The project consisted of a 10,000-line switch and four access Base Transceiver Stations (BTS). The project was to provide both voice and high speed data access in deployed areas.

The project was successfully implemented and commissioned according to plan. Initially the four BTS5 were deployed in Abuko, Brikama, Soma and Basse. Thus far, the system has performed beyond all expectations and a decision taken to expand it by about 100,000 lines with new broadband features. Its coverage was also to be extended to other parts of the country, with at least one BTS deployed in each of the administrative divisions.

3.2.8.5 Internet Resource Centre

The main objective of this project was to replace the obsolete management system of the Internet to be able to offer such services as e-commerce, e-Health, e Education, e-Government etc, provide whole sale of Internet services, server hosting and co-location, encourage private content providers, Application Service Providers (ASPs) and virtual (non-facility based) Internet Service Providers (ISPs) the platform to viably set up and operate their businesses in a more secured environment with minimum investment on their part.

3.2.8.6 Internet MPLS Backbone

The main objective of this project is to replace Gamtel's old, obsolete and un upgradeable backbone to enable it to provide a fully secure, upgradeable and redundant Internet Network as well as provide the necessary infrastructure that would allow for the cost effective setting up of call centres for Gamtel and private sector use. It will provide for a better management and control of Internet bandwidth usage, enable the support of Internet services such as e-education, e commerce, e-government, e-health etc.

3.2.8.7 Intelligent Network (IN) platform

The main objective of this project is to replace the existing obsolete pre-paid service node with a convergent IN platform with more up to date features such as pre-paid telephony,

advance free phone services and to create more business opportunities for re-sellers. This system, for use by both Gamtel and Gamcel, would offer the management of pre-paid cards, pre-paid telephony, number portability, mass calling, tele-voting etc, thereby significantly improving our finances.

3.2.8.9 Gambia Telecommunications and Multimedia Institute (GTMI)

The main objective of this project is to construct a Building for class room blocks, offices, labs, cafeteria etc, provide tools for jointing and testing of copper cables, fibre optic cables and PC repairs. Although already a Cisco-approved Regional Academy, with responsibility for Sierra Leone and The Gambia, this approval is a carry-on program and involves regular reviews and renewals. Another objective is acquire a Cisco lab bundle to enable it offer PC repairs, networking, web designing etc. and offering automatic upgrades of hardware and software through annual subscriptions to CISCO or its recognized partners. The GTMI is already offering courses locally through e-learning with certification by a number of universities. It is planned that such collaboration would be extended to the point that it can even run some technology-related courses for the University of The Gambia while at the same time offering it access to some of its facilities.

3.3 Equipment for Use of ICT Services

Given the capacity of ICTs to access, transfer and apply knowledge and information to almost every aspect of human engagement, they are increasingly being recognized in facilitating the attainment of household and national development at large. The continuous development of new technologies and their application to economic, political and social processes is creating new opportunities that could enhance the quality of life. This will depend on the type of technology and how it is used, which will ultimately depend on peoples' values and better understanding through improved data. In fact there is very little hard data at the moment to make judgments. One of the problems is that most of these developments rely on complex global networks whether they are the internet, WAP, GSM, or other networks and there is little understanding of how they impact the environment and change social behaviour. Therefore, to establish the current status of the national ICT

infrastructure of the Gambia, this survey was conducted to identify indicators that capture the country’s status on and trends in information and communication technology. Certain levels of basic infrastructure as well as organisational activities are generally required for the direct benefits of the information society to be realized.

3.3.1 Access and Use of ICT Equipment in Households

Although ICT may be meeting the needs of individuals and households in products or services delivered to them, for most individuals and households, even in most developed countries, the direct application of ICT is still relatively limited. However, households can mainly access the available information through the use of communication and telecommunication tools via radio and television programmes, to increase agricultural productivity, marketing facilities, trading opportunities and thereby reduce on household poverty. The types of tools commonly used are the radio, GSM mobile and televisions.

At national level in table 5 below, about 90% of households in the Gambia, have “access to radio”, whilst about 40% have access to “Television”. Also, the consequence of the fantastic growth of cellular telephone with 56 percent of national households that have it, has seemingly overshadow fixed lines which shows only 14.27 percent of households in the country that has this access either from their own landline or neighbours.

Table 5: National estimate of households with access to ICT

Types of ICT facilities	% of Gambian Households accessing ICT Facilities
Radio	89.98
Television	39.82
Landline (Fixed line)	14.27
Wireless Jamano phone	4.23
WLL/ Airspan	1.03
GSM Mobile	55.97
Computer/ PC	2.25
Internet	1.10
Internet Connection Type (Analogue/Dial-up)	0.47

Source: SCAN –ICT Baseline Survey 2006, The Gambia

Mobile telephones covered nearly three times as much people as fixed telephone. Moreover, the mobile telephone has become a very useful object used today in cities as well as in rural areas among almost all the levels of the society, including policy makers, traders in the

informal sector, artisans, students and even taxi drivers who have made of it a working instrument that has considerably facilitated the development of their public relations activities.

Besides landline (fixed line) telephone, access to “wireless” which is a more recent telephone facility accounted for about 4% whilst access to “wireless local loop – WLL/Airspan” accounted for just about 1%. Again from the survey data we are able to estimate that about 2% of households have access to “computer” and, about 1% have access to internet (see Table 5). However, in the same figure, only about 0.47% of households in The Gambia connecting to the internet are using “Analogue modem/Dial-up” type. Furthermore, households were asked about their main source of energy and the results shows that, about 14% of the households in The Gambia have access to “NAWEC Electricity Supply”

As could be seen in table 6, stratum-wise indicators reflected a scenario which showed that our stratification strategy succeeded in having together a more homogeneous households in each of the strata. The strata are: (1) Banjul and Kanifing, (2) Brikama Urban and Kombo North, (3) Other Urban and (4) Rural. The stratification was employed based on the fact that the units in each stratum will have about equal probability of accessing ICT facility. Whilst about 93% of households in Banjul and Kanifing, as one stratum, have access to radio, Brikama Urban and Kombo North has about 97% of the households with access to radio. Other Urban and Rural accessing radio accounted for about 93 percent and 89 percent percentages respectively (see table 6 below).

Access to television manifested a downward pattern towards the rural. It could be seen in table 6 that whilst about 84% of households in Banjul and Kanifing have access to television, Other Urban and Rural combined accounted for about 36 and 29 percentages respectively. However, Brikama Urban and Kombo North were estimated to have about 75% of the households that have access to television.

Access to landline telephone showed a pattern with Other Urban stratum having about 39% of its households with access to it, above that of Briakama Urban and Kombo North that has about 18% of households (see table 6).

Table 6: Estimated percentage of households in The Gambia with access to ICT by Stratum

Type of ICT Facilities	Banjul & Kanifing	Brikama Urban & Kombo North	Other Urban	Other Rural
Radio	92.83	97.14	93.06	89.12
Television	83.88	75.26	35.63	29.37
Landphone	38.19	18.29	39.38	9.01
Wireless JAMANO Phone	5.92	2.50	15.00	3.88
Wireless Local Loop/Airspan	3.19	0.71	2.14	0.59
GSM Mobile	82.15	78.26	63.24	49.67
Computer	7.72	6.68	0.66	0.95
Internet	5.07	3.93	0.00	0.18
Electricity	71.54	21.07	9.38	1.37

Source: 2005 Scan-ICT Baseline Survey of Households, The Gambia. :Based on 1504 households

Access to landline telephone according to the survey results in table 6 above, other urban has the highest percentage, showing 39 percent accessing landphone. There are 38 percent households in Banjul and Kanifing and 18 percent households in Brikama Urban and Kombo North accessing landphone. This might be the effect of inclusion of Kombo North in the stratum, which in the recent years has emerged as a highly concentrated area in terms of population but with little or yet to benefit from infrastructural development or installations such as ICT infrastructure. The least accessing landphone is other rural accounting for only 9 percent households. The recently introduced ICT technologies such as wireless telephone and the wireless local loop (WLL/Airspan) was captured in the survey and the estimates at least show some households having access to them.

The survey estimated substantial percentages of households in all the strata having access to GSM mobile services. By virtue of this, the survey estimates are evidence of the reality on the ground. The survey further revealed an interesting pattern with estimates showing Banjul and Kanifing stratum having about 8% of households with access to computer in their homes whilst Brikama and Kombo North combined stratum has about 7% of households. In table 6,

we have seen that the first two strata have at least some households having access to internet in their homes.

The radio set is the equipment which is widely used in The Gambia; it is owned by 90.0% of households. The difference by place of residence is relatively low when compared with the other items (respectively 93.1% of urban households) and 89.3% of rural households. The television set, telephone, mobile, computer and internet facility are found in the Gambian households in both urban and rural. These ICT equipments are owned by urban and rural as clearly shown in table 7 below. These proportions reveal disparities according to the place of residence.

Table 7 : Estimated percentage of households in The Gambia with access to ICT equipments by Area

Households Access to:	Urban	Rural
Radio	93.05	89.31
Television	82.13	30.57
Land phone(fixed)	37.23	9.26
Wireless JAMANO Phone	5.96	3.85
Wireless Local Loop/Airspan	3.03	0.60
GSM Mobile	81.83	50.32
Computer	7.71	1.06
Internet	5.01	0.24
Electricity	68.43	1.75

Source: Scan-ICT Baseline Survey 2006, The Gambia. Based on 1504 households

Generally, the rates of penetration of the ICT equipment like the radio, television, fixed telephone and mobile telephone in the households remain high although large disparities exists between different local government areas (see table 8 below) for each type of equipment. The radio and GSM Mobile telephone sets are the most widely used communication tools at the level of the home by the Gambian households. Other ICT equipments like computers and internet facilities are only present in the homes of households located in Banjul, Kanifing and Brikama.

Table 8: Estimated percentage of households in The Gambia with access to ICT by LGA (in %)

Households Access to:	Local Government Area (LGA)							
	Banjul	Kanifing	Brikama	Mansakonko	Kerewan	Kuntaur	Janjangbureh	Basse
Radio	90.00	93.40	92.41	78.43	89.37	91.25	88.53	90.80%
Television	81.25	84.40	57.89	5.12	40.11	15.07	5.59	29.14
Landphone	46.25	36.58	7.74	0.17	17.45	0.00	4.04	16.67
Wireless JAMANO Phone	5.00	6.11	2.50	0.00	0.25	0.00	0.07	16.82
Wireless Local Loop/Airspan	0.00	3.83	0.11	0.00	0.00	0.00	0.07	2.93
GSM Mobile	75.99	83.39	65.35	28.37	54.19	48.62	37.23	51.07
Computer	7.57	7.76	3.16	0.00	1.90	0.00	0.00	0.00
Internet	10.00	4.08	1.34	0.00	0.00	0.00	0.00	0.00
Electricity	86.25	68.60	7.56	0.06	0.05	0.00	1.41	0.84

Source: Scan-ICT Baseline Survey 2006, The Gambia.: Based on 1504 households

3.3.2 ICT Equipment at the Workplace

The rate of penetration of computers into institutions is very high, 54.17 % of institutions on the average own two or more computers whilst 11.98% own one. The level of penetration of the computer at the workplace is 66.15 %. This figure also reveals disparities between the local government areas. The Kuntaur LGA is the only area where workers reported having zero computers in their place of work. Other LGAs reported a fair rate of usage of computers in the offices in Janjanbureh LGA with 20 percent; Mansakonko with 29.41 percent and in Kerewan with 39.43 percent. Usage of computer in the workplaces is very high for offices located in Banjul (83.88%), Kanifing (92.31%) and Basse (100.00%) local governments areas.

Table 9: Availability of Computers in the Offices per Local Government Area (in %)

Local Government Area (LGA)	No Computer	One Computer	At least two Computers
Banjul	12.90	3.23	80.65
Kanifing	7.69	16.67	75.64
Brikama	11.11	11.11	44.44
Mansakonko	64.71	17.65	11.76
Kerewan	61.76	5.88	32.35
Kuntaur	100.00	0.00	0.00
Janjangbureh	80.00	13.33	6.67
Basse	0.00	33.33	66.67
TOTAL	31.25	11.98	54.17

Source: Scan-ICT Baseline Survey 2006, The Gambia

The photocopying machine is the most used equipment at the workplace (45.77%) but remain low in the local government areas of Mansakonko (11.16%), Kerewan (17.14%) and Janjangbureh (12.50%). The low level of penetration in this local government may result from lack of support facilities like electricity and maintenance services.

Table 10: Availability of Photocopying machine in the Offices per Local Government Area (in %)

Local Government Area (LGA)	No photocopy machine	One photocopy machine	Two and more photocopy machine
Banjul	19.35	41.94	38.71
Kanifing	15.66	38.55	19.28
Brikama	44.44	22.22	33.33
Mansakonko	5.56	5.56	5.56
Kerewan	8.82	5.88	11.76
Kuntaur	0.00	14.29	14.29
Janjangbureh	0.00	0.00	12.50
Basse	0.00	0.00	66.67
TOTAL	13.43	25.37	20.40

Source: Scan-ICT Baseline Survey 2006, The Gambia

Nationally the overall penetration rates in the usage and availability of fax machine, printer and digital projector in offices is quite high at a rate of 38.31%, 58.71% and 13.93% respectively, see table 11. Printers are widely used in most offices in both urban and rural, whilst digital projectors are hardly used.

Table 11: Level of equipment for the use of ICT services at the workplace per Local Government Area (in %)

Local Government Area (LGA)	Fax machines	Printers	Digital projector
Banjul	90.32	83.87	16.13
Kanifing	51.81	77.11	20.48
Brikama	33.33	88.89	33.33
Mansakonko	0.00	22.22	0.00
Kerewan	2.94	26.47	5.88
Kuntaur	14.29	28.57	0.00
Janjangbureh	6.25	18.75	6.25
Basse	0.00	66.67	0.00
TOTAL	38.31	58.71	13.93

Source: Scan-ICT Baseline Survey 2006, The Gambia

Analysing the results by types of institutions reveals that the government, the business and the ICT sectors have a high penetration in the use of photocopying machines with respective rates of 71.88 percent, 64.59 percent and 58.33 percent. Health and the education sectors have also registered a significant availability of photocopying machines in their offices showing that copiers are widely in most sector of the economy, see table 12 below.

Table 12: Availability of Photocopying Machine in Workplace in the sector of Activity (in %)

Type of institution	No Photocopying Machine	1 – 3 Photocopying Machines	4 – 10 Photocopying Machines
Government	6.25	71.88	0.00
Health Sector	40.00	40.00	0.00
Education Sector	9.28	24.74	3.09
ICT Sector	25.00	58.33	0.00
Business Sector	18.75	60.42	4.17
TOTAL	13.57	43.72	2.51

Source: Scan-ICT Baseline Survey 2006, The Gambia

3.3.3 Access to Internet

Since the inception of internet services in 1998, Gambia has experienced sustained growth of the Internet market. Internet services that are common in the market are: email, web browsing, web hosting, discussion forums and file transfers. The survey reveals a regular increase in the number of institutional subscribers while the number of individual subscribers showed a downward trend. Investments aimed at modernising the network of the traditional operator can justify the increase in the number of professional subscribers.

The major advantage of the Gambia in Internet access is the presence of four ISPs – Gamtel, QuantumNet, Netpage and Airtip – who are licensed to operate in the country. Because of the competitive environment that prevailed among ISPs, the Dial-up Internet services are comparatively cheaper than many African countries. In fact, at an average of 200 Dalasis equivalent to 8 US\$ per month for unlimited access and less than 50 cents per hour for phone/dial up time, this therefore justifies the affordability of dial-up internet services in the Gambia.

Most of the access to Internet in The Gambia is through dial up because leased lines or direct access is expensive for the individual subscribers. Consequently the Internet access is quite slow for large amount of data transfer. Users of Internet have indicated that the speed of current dial-up internet services is very slow resulting in high dial up time cost and less reliable information exchange where large volumes of data/file transfers are concerned.

However, despite the presence of four ISPs and impressive Internet spread in the Greater Banjul area, the general Internet penetration rate remains very low in rural areas, as the actual numbers of institutions connected to the Internet in remote areas are very few. Availability of Internet access in government offices, particularly in service departments and local government offices in provinces will go a long way to provide Gambians with information, and services essential for any successful e-government.

Prominent government offices are to be provided with dedicated connection to Internet so that more web-based services can be initiated with adequate information security. ISPs are to be encouraged to increase their bandwidth with a corresponding increase in international gateway bandwidth.

The study results showed that in all the public and private institutions, there are relatively more institutions that were connected to Internet (46.23%) as compared to those institutions who reported having a Websites (22.11%) in their workplace. Institutions in the ICT sector, 91.67% and 58.33% have respectively reported having an internet connection and a website at their workplace. Institutions in the business and the government sectors reported a high proportion of internet connectivity and website ownership in their offices, see table 13.

Table 13: Availability of Internet Connection and Ownership of Website at Workplace (in %)

Type of institution	Connected to Internet at Workplace	Institution has a Website
Government	62.50	15.63
Health Sector	30.00	20.00
Education Sector	20.62	10.31
ICT Sector	91.67	58.33
Business Sector	79.17	41.67
TOTAL	46.23	22.11

Source: Scan-ICT Baseline Survey 2006, The Gambia

3.3.4 Teledensity

3.3.4.1 Fixed telephony

There has been a significant increase in the number of fixed telephone subscribers during the past three years. From 2004 to 2006, rates for a fixed telephone local call for non-busy hours as well as for busy hours have doubled. On the other hand, during the same period, charges for telephone installation remained constant for residential lines and for business lines.

Table 14: Number of Fixed Telephone Subscribers; 2004 to 2006

Subscribers	2004	2005	2006
Number of Fixed Telephone Subscribers	42,000	44,000	53,000

Source: Facts & Figures; 2005 & 2006; PURA

The provision of lines is sufficient in the different categories of institutions. For example, institutions with 1 to 3 telephone lines account for 45.73% of all telephone lines. Generally, 15.58% of institutions on the average have more than four fixed telephone lines. This is reasonably adequate to meet the communication needs in the structures. Generally, in each sector of institutions the penetration rate on availability of fixed telephone line is at least 42%, see table 15.

Table 15: Average Number of Fixed Telephone Lines in Workplaces (in %)

Type of Institution	Fixed Telephone Line			
	No line	1 to 3 lines	4 to 10 lines	11 to 20 lines
Government	0.00	18.75	21.88	3.13
Health Sector	0.00	70.00	30.00	0.00
Education Sector	2.06	47.42	1.03	1.03
ICT Sector	0.00	50.00	33.33	8.33
Business Sector	10.42	54.17	22.92	4.17
TOTAL	3.52	45.73	13.07	2.51

Source: Scan-ICT Baseline Survey 2006, The Gambia

With respect to the number of fixed telephone line in the workplace in the local government areas, the survey revealed that on average only 4.02% of sample institutions do not have any fixed telephone set in the office. Generally, 31.16% and 33.67% of institutions respectively

reported having one and at least two telephone lines in the offices as shown in table 16. The availability of fixed telephone lines in offices in each local government area appears to be same.

Table 16: Fixed Telephone sets in the Offices per Local Government Area (in %)

Local Government Area (LGA)	Fixed telephone lines		
	No set	One set	At least two sets
Banjul	6.45	25.81	32.26
Kanifing	6.02	42.17	44.58
Brikama	0.00	44.44	55.56
Mansakonko	0.00	22.22	22.22
Kerewan	2.94	29.03	14.71
Kuntaur	0.00	0.00	14.29
Janjangbureh	0.00	6.25	18.75
Basse	0.00	33.33	66.67
TOTAL	4.02	31.16	33.67

Source: Scan-ICT Baseline Survey 2006, The Gambia

3.3.4.2 Mobile telephony

The mobile telephony service is provided by GAMCEL and AFRICELL through GSM 800/900 networks with country wide coverage. The mobile telephony experienced a rapid increase in the Gambia in 2001 with a large number of Gambians owning mobile sets. The penetration rate increased from 7.33% in 2003 to 16.87% in 2006, see table 17.

Table 17: level of fixed and mobile telephone expressed as the number of lines per 100 inhabitants

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Fixed	2.15	2.39	2.65	2.71	2.66	2.81	2.99	3.05	4.72
Mobile	.42	.43	0.45	4.26	7.53	7.33	12.47	15.35	16.87
Total	2.58	2.82	3.09	6.97	10.19	10.14	15.47	18.40	21.59

Source: Annual Report 2006, PURA

The proportion of households owning a mobile telephone is by far greater than those households that own fixed telephone lines, see table 18. The analysis of the study results showed that about 65.09 percent of responding households do have a mobile telephone.

There is not much disparity in proportion of households in the urban (76.58%) and rural (54.75%) that own a mobile telephone.

Table 18: Distribution of households equipped with individual telephone by Area of Residence (in %)

Type of facility Available	Urban	Rural	The Gambia
Access to Electricity	63.22	18.75	39.89
Fixed telephone owned	32.17	10.27	20.64
Mobile telephone owned	76.58	54.75	65.09

Source: Scan-ICT Baseline Survey 2006, The Gambia

Moreover, it should be noted that this level of mobile telephone equipment on the ground is fairly distributed in the local government areas. In both local government areas of Banjul and Kanifing, which are exclusively urban, the cell phones were used by more than 75 percent of households. There are still great regional disparities notably because of limited telephone network coverage in the North Bank of the river Gambia.

Table 19: Estimated percentage of households in The Gambia with access to ICT by LGA (in %)

Households Access	Local Government Area (LGA)							
	Banjul	Kanifing	Brikama	Mansakonko	Kerewan	Kuntaur	Janjangbureh	Basse
Fixed telephone	46.25	36.58	7.74	0.17	17.45	0.00	4.04	16.67
Mobile telephone	75.99	83.39	65.35	28.37	54.19	48.62	37.23	51.07
Electricity	86.25	68.60	7.56	0.06	0.05	0.00	1.41	0.84

Source: Scan-ICT Baseline Survey 2006, The Gambia .: Based on 1504 households

The proportion of households having access to electricity in urban area is more than three folds of the rural households.