



ICT AND SOCIO-ECONOMIC TRANSFORMATION: THE EXPERIENCE OF NIGERIA*

Joseph O. JIBOKU**

Abstract

The emergence of information and communication technology (ICT), especially in developing countries, can best be described as epochal. This is mainly because of the socio-economic transformation it has brought about. Virtually every aspect of modern life has been touched by ICT: countries have witnessed massive injection of funds through direct foreign investment, banking operations have been revolutionised, hitherto unknown employment creation opportunities have become a reality, business operations have been enhanced without the necessity for physical contact, and vehicular movement has been enhanced in many countries. In many developing countries, the traditional drawbacks of poor infrastructure have been largely overcome through the deployment of ICT. In many African countries, however, the actual impact of ICT on socio-economic development has yet to be studied in any systematic way – a lapse attributable in part to the fast pace of change that characterises the ICT sector, but also to the fact that compared to the developed countries, African countries still lag behind in ICT investment, and the low-level of support by government and the private sector to research devoted to track development trends. This paper explores current literature on the impact of ICT on socio-economic transformation based on the Technology Acceptance Model (TAM) of Fred D Davis (1989). Focusing on Nigeria, but with lessons drawn from South Africa and other African countries, the paper highlights, among other things, the factors that enhance or inhibit the contributions that ICT could make in the country's drive to transform the economy.

Keywords: Information, Communication, Social, Economic, Transformation, Development.

Introduction

Technological innovation in the 20th century has led to significant developments in new technologies such as biotechnology, new materials and micro-electronics together with innovations in software development. The combination of advanced micro electronics and innovations in software has led to systemic terminologies which have come to form a pervasive cluster of information and communication technologies (Mansell, 1994). The world has become a global village; technologically driven, information centred and knowledge based. Thus, information technology has been accepted as being one of the most significant forces of modernisation in the last twenty years (Thioune 2003; Ogbomo and Ogbomo 2008:1; Warschauer 2003:297-304).

There is a widespread research interest in information and communication technologies (ICTs) as several studies are carried out by scholars on the impact of ICTs to the lives of individuals, groups, organisations and nations - both developed and developing. In the past two decades, according to Thioune (2003), most developed countries have witnessed significant changes that can be traced to ICTs. These multi-dimensional changes have been observed in almost all aspects of life: economics, education, communication and travel.

Helmut (1998) cited in Akpofure (1999), notes that of all the changes that have influenced our lives in recent years, information technology (IT) has had the greatest impact and this will continue at least until the end of the first half of the century when other major technological breakthroughs in the area of new materials, biotechnology or energy may provide entirely new ways of living. ICTs, according to Ukandu and Iroh (2011:52) have transformed the socio-economic status of nations that today's economy is measured on the availability and production of information and referred to as 'knowledge economy'. The advent of ICTs brought about a lot of changes in daily living; the access and non access to ICTs have significantly influenced our ability to acquire social resources such as education, employment, financial support, political expression and social position (Warschauer, 2003:297-304).

* An earlier version of this paper was presented at the 18th Congress of the South African Sociological Association (SASA), University of Cape Town, Cape Town, South Africa. 1st-4th July, 2012. Appreciations to the University of Fort Hare, South Africa for providing funds for the conference.

** Dr., Department of Sociology, Faculty of The Social Sciences, Olabisi Onabanjo University, Ago-Iwoye, Ogun State Nigeria.



Research on the developmental potential and impact of information and communication technologies is therefore a multi-disciplinary field with contributing disciplines such as Information Science (IS), Human Computer Interaction (HCI), Communication Studies, Development Studies, ICT and Development (ICTD). Studies are based on the premise that ICTs can contribute to the socio-economic conditions in developing countries; however, a common assumption in ICTD research for example, is that developing countries are disadvantaged in relation to ICT innovation experiences in the context of origin of new technologies and this has culminated in the notion of 'digital divide' signifying a new form of inequality (Argerou, 2010:1-3).

Notwithstanding the fact that ICTs are widely believed to have a part to play in transforming the life conditions of citizens in developing countries with perceived potential contributions to capacity building and poverty alleviation, good governance, healthcare coverage and delivery, there have been views expressed about the value to citizens, of projects, scalability from small to regional or national initiatives, and long term sustainability of the projects. (Madon et.al, 2009:95-107; McGrath and Maiye, 2011). Concerns have also been raised on the need for improvements in basic facilities and government structures as pre-requisites to development agendas, and the continued dominance of western scientific knowledge over local indigenous forms of knowledge guiding the development efforts (Pury and Sahay, 2007:133-160).

In this line of thinking, therefore, the emergence of new ICTS has affected theoretical and practical assumptions about the role of technology in socio-economic development. Arguments abound as to whether these new technologies can shape development, are appropriate to local culture and fit with the development approach used. The link between technological growth and socio-economic development is seen to be generally based on historical facts bound in western industrialised world experiences. Rhodes (2005) asserts that whilst popular development dialectical reasoning points to the promise of significant economic and social transformations, little effort, so far, has been made to understand the changes enabled by the new technologies and how they could be usefully applied to an African rural environment.

This study therefore examines the impact of ICTs on socio-economic transformation in Nigeria. The position is presented that Nigeria (and in fact, African countries) can take maximum advantage of the potentials of ICTs. The challenge however, includes adapting ICTs to local conditions and uses in developing countries and allowing each country understand those innovations and adjust them to their own development needs.

ICTs: Theoretical and Conceptual Clarifications

This paper is anchored on the Technology Acceptance Model (TAM) by Fred D. Davis 1989. According to this theory, individual or collective behaviour to adopt a system of innovation is influenced by two ideas: perceived usefulness as well as perceived ease of use. Usefulness implies the belief that it will facilitate and enhance productivity. According to Davis, individual or collective conviction of usefulness will positively influence adoption of such technology. In Nigeria, the general belief in the relevance and positive contributions of ICTs to productivity enhancement remains a strong reason for its adoption and usage despite the challenge of complementary infrastructural deficiency.

The above theoretical analogy is supported by empirical evidence. Ndukwe (2002:16) opines for instance, that information and communication technologies (ICTs) have been the basis for human existence from time immemorial and this has driven man to continuously seek ways to improve the processing of information and communicating such information to one another irrespective of distance and on a real-time basis. Hence, the concepts: 'information revolution'; 'information society'; 'information age'; 'information technology'; are driven by enormous advancements in information and communication technologies (ICTs) and their application. At the heart of ICTs lie two main branches of technology: computer and telecommunication. The technologies covered are the computer system, internet/electronic mail (e-mail), mobile phone and fax machine (Ogbomo and Ogbomo, 2008:2).

Information and communication technologies refer to several forms of information exchange between two or more computers through any of the several methods of inter-connection. These technologies provide speedy, inexpensive and convenient means of communication (Kajogbola, 2004). According to Anyakoha (1991:106-108), information technology is the use of man-made tools for the collection, generation, communication, recording, re-management and exploitation of information. It includes those applications and commodities by which information is transferred, recorded, edited, stored, manipulate or disseminated. Hawkrige (1983:161), on his own part, describes information technology as a revolution which has penetrated almost all fields of human activity, thus transforming economic and social life.

Also, it is important to note that in examining literature on the ICT and development discourse, information and knowledge (terms which are often used interchangeably) are commonly confounded with



availability of technology. What is exactly meant by the terms 'information' and 'knowledge' is seldom specified in the ICT and development texts showing a lack of conceptualisation of the contested nature of knowledge and the existence of various knowledge systems and practices (Heeks, 2002:101-112; Kraemer, et.al 2009:66-73). Wilson (2001) note that there are questions which bother on whether lack of access to ICTs implies lack of information or knowledge or rather just the absence of certain forms of information.

Warschauer (2001), notes the term "Digital Divide" which refers to the gap in access to information and communication technologies (ICTs). According to him, that technology is available does not mean it is accessible. The divide is not simply a dichotomy between those who have the technologies and those who do not. More importantly, it is the "ability to access, adapt and create knowledge via the use of information and communication technology". Information is generated in, and for a specific context and this does not mean that it is relevant or needed in another context. Within the ICT and development discourse, these terms are used very broadly and other times quite specifically depending on the argument being made. For example, it is most common for an economic definition of information and knowledge to be assumed, although government information, health information and agriculture information are also mentioned (Heeks 2002; Queau 2000; Hobart, 1993).

Wilson (2001), however informs that we should take note that while ICTs may provide a means of accessing certain types of information that might be needed and might not be available, the concern is that we should be careful not to overlook the information that is available and may not require ICTs for dissemination, so that we can also make use of this valuable resource in development efforts.

Marcelle's (2002) concise and comprehensive definition provides that information and communication technologies (ICTs) are a complex and heterogeneous set of goods, applications and services used for producing, distributing, processing and transforming information - included in this set are the outputs of industries as diverse as telecommunications, television and radio broadcasting, computer hardware and software, computer services and electronic media (e.g. internet, electronic mail, electronic commerce, computer games). ICTs are a systemic pervasive set of technologies that are associated with fundamental institutional, social and economic restructuring.

For Wangwe (2007:1), ICT refers to a myriad of standalone media, including telephone and mobile telephony; radio, television, video, tele-text, voice information systems and fax, as well as computer-mediated networks that link a personal computer to the internet. ICT, according to him, is an integrated system that incorporates the technology and infrastructure required to store, manipulate, deliver and transmit information, the legal and economic institutions required to regulate ICT access and usage, and the social and interpersonal structures which allow information to be shared, facilitate access to the ICT infrastructure, and through which innovation takes place.

The definition of the United Nations Economic and Social Council (2001) however, provides a synergy in the conceptualization of information and communication technologies, thus: *"ICTs serve as a transmission belt to generate, access, disseminate and share knowledge, data, information and communication and best practices. Three central features are at the heart of the knowledge revolution. Information and knowledge are instantaneously accessible; they are transportable and can be simultaneously distributed to an unlimited number of users. Indeed, they cannot be depleted. The use by one does not prevent the use or consumption by somebody else. They cannot be owned, though their delivery mechanisms can. Selling them entails sharing, not exclusive transfer. Indeed information and knowledge represent a global public good"*.

ICTs and Socio-Economic Development: An Interface

There is today a considerable consensus among scholars regarding the ICTs contribution to national productivity and growth. The importance of communication in any country, whether developed or developing is so obvious and rising figures on internet use, the number of web servers and the density of cellular mobile telephones, all show a rapid increase in the use of information and communication technologies. Orji Okoro (2006:53-36) asserts that mobile telephony usage by individuals enables them to communicate with loved ones, clients and business associates. For large businesses, it is a means of providing a service that leads to an increase in profits. For governments, revenues are gained through taxes and duties, and as a tool for sustainable livelihoods, mobile telephones provide employment for many who have been idle.

Mariscal et.al (2008:11), note that the dramatic technological changes occurring in the telecommunications industry in recent decades have bolstered the industry's contribution to economic and social development. These scholars assert that information and communication technologies offer opportunities for increasing the productivity and competitiveness of the workforce. Bassols-Lopez's (2002)



empirical study on the ICT, found that ICT had a positive effect on employment and, consequently, on countries' economic growth.

Mobile operators contribute to the economy by creating work places and jobs that rely on the distribution of mobile technology and services. This contribution also takes the shape of employment beyond the telecom operator ranks, by enhancing entrepreneurship, productivity and other commercial skills. The use of mobile phones enables professional and economic agents to multitask and carry out various activities simultaneously. (Pyramid Research, 2010:43).

According to Tiemo (2006:90-99), the importance of information cannot be over-emphasized. People need information to plan and carry out their decisions. More than 90% per cent of Africa's population could greatly benefit from information on better choice of food, safe water and basic nutrition; childcare, family planning, immunization, prevention and control of endemic diseases. The combination of modern communication devices could play significant roles in the collection and dissemination of global information. For Ogbomo and Ogbomo (2008:7), new ICTs can offer real opportunities to improve the quality of community life but it is also important to deepen our level of reflection on community dynamics and on constraints encountered when introducing and using ICTs for development.

The correlation between information, communication and economic growth are well known making the significance of networks apparent. Electronic networking is a powerful, rapid and inexpensive way to communicate and exchange information. When networks are available, developmental changes can be sporadic. Access to GSM and Satellite TV networks also improves the effectiveness of the development of communities, comprising representative of international agencies, staff of non-governmental organizations and others working locally and abroad. (Ukandu and Iroh, 2011:52).

Isiguzo (2010:7), asserts that it is an established fact that the economic development of a nation can be accelerated by improvements in the country's ICT infrastructure. This is because ICTs, if well harnessed, provide a proper platform for development across all sectors of the economy. ICTs not only contribute to the development of commercial activities, education, health and governance, but are also key enablers of broad based social and economic development and of sustainable human development in a more general sense.

Information and Communication Technologies (ICTs), are the bedrock for the survival of and development of any nation in a rapidly changing global environment. (Federal Republic of Nigeria, 2001).

Achimugu et.al (2009:37-46), opine that this present day economic status has potentials to a fast economic development of a nation and thereby brings about high level of poverty reduction. Its greatest effect in businesses is the access to a wider global market through e-commerce. The areas of education, health, social policy, commerce and trade; government, agriculture, communications and science and technology all benefit from access powered by ICT. These resources are interlinked and synergetic; individuals can visit and exploit relevant information sources which often point to additional sources of information and to knowledgeable individuals.

In his Special Remarks on Information and Communication Technologies, Governor of Central Bank of Nigeria, Chief (Dr.) Sanusi (2003:3-4), also notes that by developing and executing a robust ICT strategy, many developing nations and companies have enhanced their cutting edge and vastly improved their core competencies in these areas. Some of these nations and companies have achieved competitive edge because the improvements in their ICT had allowed them to leverage the benefits of network economies, knowledge management and the advantages of rapid, frictionless, information flow. They have optimised the full spectrum of their capabilities and have from it, realised significant gains in sharing information, products, ideas and intellectual capital. In that way, they have positioned themselves in leadership roles in the global market place of the new millennium. He notes further that the evidence with independent initiatives all over the world have revealed the potentials of information and communication technologies in:

- Empowering people to help themselves in a very broad range of applications irrespective of their age, gender, race or level of education;
- Addressing the multi-dimensional nature of poverty; and
- Transferring the initiatives for development from outside sources to individuals, communities, local authorities, and nations.

ICTs for development in Africa

The discussion on ICTs and socio-economic growth in developing countries in the last two decades is structured around the urgency to achieve socio-economic growth within the countries and the necessity to integrate into an increasingly networked global economy. (Akpan-Obong, 2007:1). Africa's information infrastructure however, is by far least developed in the world. Technical statistics consistently show that



Africans have the smallest number of telephone lines, the most restricted access to computer equipment, the most primitive information networks and the most inaccessible media systems. (Akhtar and Laviolette (quoted in Hall, 1998:2). Africa is a developing continent and the lack of developed infrastructure for information and communication technologies is exacerbating the gap between the continent and the developed world. The table 1 below shows a reflection of this gap.

Key ICT indicators for developed and developing countries and the world (totals and penetration rates)

	Millions					Per 100 inhabitants				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Fixed-telephone Subscriptions										
Developed	562	552	542	531	520	45.7	44.7	43.7	42.7	41.6
Developing	691	676	662	655	652	12.4	12.0	11.5	11.3	11.1
World	1253	1228	1204	1186	1171	18.4	17.8	17.3	16.9	16.5
Mobile-cellular Subscriptions										
Developed	1383	1418	1475	1538	1600	112.5	115.0	119.0	123.6	128.2
Developing	3257	3901	4487	4872	5235	58.3	69.0	78.3	84.3	89.4
World	4640	5320	5962	6411	6835	68.1	77.2	85.5	91.2	96.2
Active mobile-broadband Subscriptions										
Developed	450	529	683	788	934	36.6	42.9	55.1	63.3	74.8
Developing	165	249	472	768	1162	3.0	4.4	8.2	13.3	19.8
World	615	778	1155	1556	2096	9.0	11.3	16.6	22.1	29.5
Fixed (wired)- broadband Subscriptions										
Developed	271	291	306	322	340	22	24	25	26	27
Developing	197	236	282	316	357	4	4	5	5	6
World	468	527	588	638	696	7	8	8	9	10
Individuals using the internet										
Developed	773	830	875	913	958	62.9	67.3	70.5	73.4	76.8
Developing	974	1193	1398	1584	1791	17.5	21.2	24.5	27.5	30.7
World	1747	2023	2273	2497	2749	25.7	29.5	32.7	35.7	38.8

Source: ITU World Telecommunication/ICT Indicators database. Available: www.itu.int/en/ITU-D/Statistics/Documents/Statistics/2013. Accessed - 16/07/2013.

There are two schools of thought on the appropriateness of ICT for sustainable development in Africa. Advocates are hopeful that the new technologies would provide solutions to present and future problems while pessimists disagree, pointing to the dangers and pitfalls of new communication technologies. To sceptics, therefore, these technologies would engender unemployment. There are also cultural concerns and fears over local production, and cyber crimes.

Djamen et.al (1995:228-233), are optimistic about the potentials of ICTs for Africa's development. They argue that electronic networking will not only enable Africans access global data but will also help the entire world to access information on Africa in Africa. Thus, the present situation in which Africans do not directly control their own data would be reversed. For Salawu (2008:115), ICTs present a golden opportunity for developing countries, particularly of Africa to draw from the ocean of developed nation's information for national development and at the same time contribute to global pool of information.

Other views are pessimistic about the potential of information and communication technologies in bringing about development in an underdeveloped continent plagued with several political, social and economic crises. Stevenson (1991), for example wonders if the new telecommunication technologies



monopolized by the privileged industrial world will be enough to address the world's most serious problems of poverty, hunger and alienation. The implication is that new communication technologies which do not address immediate human needs are not quite useful to human society no matter how efficient they may be in increasing communication among people.

For Odedra-Straub, 1995:227, Africa lacks the financial resources and skilled human resources to sustain ICTs in addition to changes in social, cultural, managerial, political and organizational environments. The fact that ICTs have brought about socio-economic transformation in developed countries will not exactly be the same for developing countries. This notion is in line with the fact that solutions that work in some cities cannot simply be transplanted to rural areas and that solutions must be based on an understanding of local needs and conditions. African leaders and policy makers are therefore urged to be cautious in their dependence on ICTs to ignite a virtuous circle of sustainable development.

Langinia (2005:144), in his own view. Opines that there is no doubt that Africa has been hard-hit with poverty and disease and this has had an immense effect on the quality of socio-cultural and political lives of the people and has made development to move at a very slow pace in the last decades. The presence of information and communication technologies (ICTs) has somewhat carved out an alternative path to development.

In a Pilot Study on the impact of new information and communication technologies (ICTs) on socio-economic and educational development of Africa and the Asia Pacific: Private, African interviewees considered ICTs as appropriate to their societies for various reasons even in the face of poverty:

- ICTs were generally seen as the basic tool for survival in the next century.
- ICTs were seen to enhance efficiency in the work place and there was a high belief in ICTs' ability to increase ease and spread of social communication, and at the same time obviate the problem of transportation.
- ICTs help to solve socio-economic problems among university academics. These assist them to reach out to colleagues in other parts of the world and keep them up-to-date with developments in their disciplines.
- There was the belief that ICTs help to monitor crime in society, and ultimately that ICT usage will make Africa to become part of the global trend.

In response to its underdevelopment, African countries individually and collectively, have initiated different measures both at the national and sub-regional levels in the area of ICTs' improvement. At a continental level however, Africa has adopted a renewal framework, the New Partnership for Africa's Development (Nepad) which identifies ICT as central in the struggle to reduce poverty in the continent. ICT provides hope for overcoming barriers of social and geographical isolation; increase access to information and education, and enable the poor to participate in the making of decisions that have an impact on their lives. African countries are also rising up to the reality of the global based ICT revolution. (Draft White Paper on e-Education, 2003).

South Africa, like some other African countries has advanced in economic development. Findings in 2006 show that the greatest number of internet users in Africa resides in either South Africa and Kenya in the sub-region or in Morocco and Egypt in the northern region. (www.allafrica.com, www.itu.int). ICTs adoption and use in these African countries has contributed in economic development of these countries. Economic development means primarily that capital has been generated and communication infrastructures in these countries have improved tremendously.

According to Moodley (2003:29), South Africa has a well-developed internet infrastructure in business and academia and its degree of connectivity places it in the top 25 in the world. South Africa has an advanced telecom network in the commercial centres. The number of dial-up subscribers grew by an average annual rate of 80% since 1994, and the number of internet users had surpassed the one million mark by 1998. Of the estimated three million internet users in Africa, two million are in South Africa. In addition, more than 90% of Africa's internet traffic is generated in South Africa. If technology is an indicator for economic growth, then we can say almost with certainty that South Africa, unlike other African countries in the sub-region has advanced in economic development. (Langinia, 2005:144-156).

The GSM Association, which represents mobile operators worldwide, reports that South Africa holds 10% of the continent's 619.8 million mobile subscribers. This figure is expected to reach 735 million by the end of 2012. The industry contributes \$56 billion to the regional economy, equivalent to 3.5% of total gross domestic product. (<http://www.itu.int/ITU-D/ict/ITU> 2012. Accessed 06/6/2012). According to the Founder and Chief Technology Officer of Prezence Digital, Tim Bishop, there are close to 32 million mobile



internet-capable devices in South Africa, with more than 14 million actively using mobile web and data services. In comparison, there are only 6 million desktop internet users. (<http://www.businesslive.co.za>. Accessed 06/06/2012). Table 2 illustrates African countries' ICTs indicators, 2007.

Africa, ICT Indicators, 2007

	Population	Main telephone lines		Mobile subscribers		Internet users	
	000s	000s	p. 100	000s	p. 100	000s	p. 100
Algeria	33'860	2'922.7	8.63	21'446.0	63.34	3'500.0	10.34
Egypt	75'500	11'228.8	14.87	30'047.0	39.80	8'620.0	11.42
Libya	6'160	852.3	14.56	4'500.0	73.05	260.0	4.36
Morocco	31'220	2'393.8	7.67	20'029.0	64.15	7'300.0	23.38
Tunisia	10'330	1'273.3	12.33	7'842.0	75.94	1'722.2	16.68
North Africa	157'070	18'670.9	11.91	83'865.0	53.39	21'402.2	13.64
South Africa	48'580	4'642.0	9.56	42'300.0	87.08	5'100.0	10.75
South Africa	48'580	4'642.0	9.56	42'300.0	87.08	5'100.0	10.75
Angola	17'020	98.2	0.62	3'307.0	19.43	95.0	0.60
Benin	9'030	110.3	1.22	1'895.0	20.98	150.0	1.66
Botswana	1'880	136.9	7.78	1'427.0	75.84	80.0	4.55
Burkina Faso	14'780	94.8	0.70	1'611.0	10.90	80.0	0.59
Burundi	8'510	35.0	0.45	250.0	2.94	60.0	0.77
Cameroon	18'550	130.7	0.79	4'536.0	24.45	370.0	2.23
Cape Verde	530	71.6	13.80	148.0	27.9	33.0	6.36
Central African Rep.	4'340	12.0	0.29	130.0	2.99	13.0	0.32
Chad	10'780	13.0	0.13	918.0	8.52	60.0	0.60
Comoros	840	19.1	2.33	40.0	4.77	21.0	2.56
Congo	3'770	15.9	0.40	1'334.0	35.40	70.0	1.70
Côte d'Ivoire	19'260	260.9	1.41	7'050.0	36.6	300.0	1.63
D.R. Congo	62'640	9.7	0.02	6'592.0	10.52	230.4	0.37
Djibouti	830	10.8	1.56	45.0	5.40	11.0	1.36
Equatorial Guinea	510	10.0	1.99	220.0	43.35	8.0	1.55
Eritrea	4'850	37.5	0.82	70.0	1.44	100.0	2.19
Ethiopia	83'100	880.1	1.06	1'208.0	1.45	291.0	0.35
Gabon	1'330	36.5	2.59	1'169.0	87.86	81.0	5.76
Gambia	1'710	76.4	4.47	796.0	46.58	100.2	5.87
Ghana	23'480	376.5	1.60	7'604.0	32.39	650.0	2.77
Guinea	9'370	26.3	0.33	189.0	2.36	50.0	0.52
Guinea-Bissau	1'700	4.6	0.27	296.0	17.48	37.0	2.26
Kenya	37'540	264.8	0.71	11'440.0	30.48	2'770.3	7.89
Lesotho	2'010	53.1	2.97	456.0	22.71	51.5	2.87
Liberia	3'750	...	...	563.0	15.01	...	...
Madagascar	19'680	133.9	0.68	2'218.0	11.27	110.0	0.58
Malawi	13'930	175.2	1.26	1'051.0	7.55	139.5	1.00
Mali	12'340	85.0	0.69	2'483.0	20.13	100.0	0.81
Mauritania	3'120	34.9	1.10	1'300.0	41.62	30.0	0.95
Mauritius	1'260	357.3	28.45	936.0	74.19	320.0	25.48
Mozambique	21'400	67.0	0.33	3'300.0	15.42	178.0	0.90
Namibia	2'070	138.1	6.66	800.0	38.58	101.0	4.87
Niger	14'230	24.0	0.17	900.0	6.33	40.0	0.28
Nigeria	148'090	6'578.3	4.44	40'396.0	27.28	10'000.0	6.75
Rwanda	9'720	16.5	0.18	679.0	6.98	100.0	1.08
S. Tomé & Príncipe	160	7.7	4.86	30.0	19.09	23.0	14.59
Senegal	12'380	269.1	2.17	4'123.0	33.31	820.0	6.62
Seychelles	90	20.6	23.79	77.0	89.23	29.0	35.67
Sierra Leone	5'870	...	...	776.0	13.23	10.0	0.19



Somalia	8'700	100.0	1.15	600.0	6.90	94.0	1.11
Sudan	38'560	345.2	0.90	7'464.0	19.36	1'500.0	3.89
Swaziland	1'140	44.0	4.27	380.0	33.29	42.0	4.08
Tanzania	40'450	236.5	0.58	8'252.0	20.40	384.3	1.00
Togo	6'590	82.1	1.30	1'190.0	18.08	320.0	5.07
Uganda	30'880.0	162.3	0.53	4'195.0	13.58	2'000.0	6.48
Zambia	11'920	91.8	0.77	2'639.0	22.14	500.0	4.19
Zimbabwe	13'350	344.5	2.58	1'226.0	9.18	1'351.0	10.12
Sub-Saharan	757'880	12'098.3	1.65	138'310.0	18.28	23'904.2	3.23
AFRICA	963'530	35'411.2	3.77	264'475.0	27.48	50'406.4	5.34

Updated: 24.04.2008

Source: ITU World Telecommunication/ICT Indicators Database.

South Africa, like other African countries, however, is still falling short of expanding internet connection to the rural areas because of lack of telephone lines availability. The country however, has been able to create many effective IT companies which bring about new jobs and consequently an improvement in the economic life of the people. These companies are: Ariel Technologies, Dimension Data, Johnnic, Ixchange, McCarthy's, Nedbank and Super Group (Moodley, 2003:29).

The Nigerian Situation

Nigeria is the eighth most populous country in the world and a major player in Africa in both the size and growth of its economy. (Olivier, et.al 2012:131). It is the country that has the largest population in Africa and accounts for 47% of West Africa's total population with over 150 million inhabitants located in 36 states and the Federal Capital Territory of Abuja. The country is currently ranked 142 out of the 169 on the human development index (UNDP, 2010) which measures peoples' wellbeing in terms such as life expectancy, literacy and standards of living – and is also classified low on a range of other developmental indicators including per capital, gross domestic product (GDP).

Nigeria is rich in natural resources, yet poverty levels in the country remain high, with the majority of Nigerians still living on less than US\$1 a day. Efforts to improve the levels of socio-economic development in the country are hampered by poor infrastructure, particularly outside the major urban areas. Utility supplies are unreliable, with the result that businesses turn to alternative (and usually more expensive) sources leading to high overhead costs, for example, reliance on privately owned generators for electricity. (McGrath and Maiye, 2011).

Nigeria is one of the Third World Countries that are just rising up to the realities of the global ICT based revolution. The Nigerian mobile market is a comparatively young market by African standards with the first mobile services only launched in 2001. However, the Nigerian global market has emerged as the fastest growing mobile market in Africa registering triple-digit growth rates in subscriber numbers. (http://www.african telecom news.com/resources/Africa opp_Nigeria.shtml. Accessed 19/6/2012). Salawu (2008:116), however, noted that concerning information and communication technologies, the situation in Nigeria is a far cry from what obtains in the advanced nations. The country is however coming along but at a slower pace but is still trapped among the group of nations categorised as information poor societies. Low technology, inadequate planning, poor implementation, lack of expertise, under-funding and high costs of equipment occasioned by unfavourable exchange rates are major factors militating against ICT revolution in Nigeria.

The country is not however relenting in her efforts to be part of the global village but a lot still needs to be done in order to achieve a breakthrough in ICT. The Federal Government has accorded ICT development a national priority and this found expression in the policy tagged "National Policy for Information Technology" which contains IT policy guidelines for the country. (Pyramid Research, 2010:7).

In a highly competitive market, the telecommunications industry in Nigeria has continued since 1999 to grow exponentially, which has led to increased access nationwide. The market has been described as one of the world's fastest growing telecommunications markets, especially between 2001 and 2007. These achievements can be attributed largely to the foresight of the government in embracing sector reform and creating an enabling and conducive environment with respect to policy and the regulatory regime. The nation's tele-density currently exceeds 50% with about 74m subscriber lines as of the end of December 2009. Access to modern telecommunication services is now within reach of more than 90% of the people who live



within Nigeria. (Isiguzo, quoted in Pyramid Research 2010:7). Mobile services have a far-reaching positive impact on the daily lives of Nigeria's mobile end users and this underscores the important role telecommunications play in social and economic development. Table 3 presents a forecast for mobile subscribers in Nigeria from 2002-2011.

Table 3 – Nigeria – Mobile Subscribers (2002 – 2011, in Millions)

Year-End	Subscribers	Year-End	Subscribers
2002	1.57	2007E	44.28
2003	3.15	2008E	57.73
2004	9.58	2009E	70.14
2005E	18.56	2010E	81.08
2006E	30.76	2011E	90.47

Source: Portio Research Ltd.

Pyramid Research estimates that in the time since the Nigerian government successfully liberalized the telecommunications industry in 2001, capital investments in mobile networks and operations have constituted 80% of overall investment going into the telecommunications sector – a total of more than \$12bn by the middle of 2008. Total figure for the industry, as of March 2010, according to the Nigerian Communications Commission reached \$18bn of which \$16bn is related to mobile. In addition, the mobile industry has contributed more than 3m direct and indirect jobs in Nigeria, including employees of mobile service providers and those in independent distribution channels and points of sale across the country. (Pyramid Research, 2010:16).

A study carried out by Nigeria Development Collaborative on E-Readiness Assessment on Nigeria, (February-April 2004), revealed that investors in the country's ICT sector, particularly telecommunications companies such as MTN, Globacom's GLOMOBILE have been constantly and progressively expanding their networks, although due to lack of, or poor infrastructure, most of them have had to build or provide their own infrastructure. The resultant effect has been that the cost of telecommunications and allied services such as internet are still relatively high. Findings also has it that a vast majority of private internet users access the internet through dial-up facilities while a small percentage made up of mostly corporate bodies and very few private individuals through VSAT link-ups provided by internet service providers. The impact of the internet on Nigeria's economy lags behind that of other aspiring countries as this sector contributes 0.5 per cent to its current GDP. (Olivier, 2012:131). Rapid growth of the mobile market, coupled with Nigerians' use of these devices as a means to access the internet suggests that the internet will rapidly penetrate the population.

Licensing fees are one of the most direct ways in which mobile operators contribute towards the economy of their host countries, and in Nigeria, since the introduction of GSM in 2001, the government has received more than 2.5bn from spectrum licensing fees. In 2007 alone, the Nigerian government received a total of more than \$1bn from the sale of licences. Import dues and taxes from the telecommunications industry have also contributed substantial amounts of revenue to the Federal Government. MTN's licence, for example, stipulates that it pays 2.5% of its assessed net annual revenue. The operator also implemented a policy to spend 1% of its annual after-tax profits on corporate social responsibility via its MTN Foundation, established in 2005 to finance initiatives in education, economic empowerment and health issues. (Pyramid Research, 2010:42).

Undoubtedly, however, Nigeria still faces the problem of lack of accessibility of telecommunication facilities in its rural areas just as other African countries, but one discovers that in some rural areas in Nigeria, internet access is practically non-existent and most Nigerians do not even know what it means. In general terms, ICT human resource base in Nigeria can also be said to be still at infancy level (but growing) in the urban areas. This shows that ICTs' huge potentials are yet to be taken full advantage of. (Nigeria Development Collaborative Study, 2004:4-6).

It is also a matter of concern in Nigeria that ICT education only exists in tertiary educational institutions and private training institutions; and a negligible number of elitist privately owned primary and secondary educational institutions mainly patronised by the elite in the country who form a very small minority among the total population of the country. There is currently a dearth of useful, practically relevant local content on the internet in respect of Nigeria and as a result, interest is limited to a small percentage of the populace. (Nigeria Development Collaborative Study, 2004:4-6).



The following conclusions were presented in the Executive Summary of the Pyramid Research carried out on the impact of new information and communication technologies (ICTs) on socio-economic and educational development in Nigeria, February – April, 2010: 1-16:

- Mobile services have ample reach in Nigeria and will continue to post rapid growth. According to the Pyramid Research estimates, mobile services are already in use by a significant proportion of Nigeria's population. The number of mobile subscription in the country was roughly 73m in 2009, resulting in a mobile penetration of 49% of the population.
- The mobile industry has generated substantial investment in infrastructure and employs a significant number of Nigerians.
- Nigerian mobile end users agree that mobile services have positively influenced every aspect of their lives, connecting them to clients, co-workers, relatives, friends, thus helping people access information, creating business opportunities, lowering transaction costs and enhancing social interaction.
- An analysis of mobile applications in the areas of agriculture, education, health, productivity, transport and finance across differing emerging markets shows that these services are generating interests and participation from end users, thanks to their tangible impact on day-to-day lives.
- The development of the mobile data market in Nigeria will be driven by collaboration among equipment and handset vendors, mobile operators, local government and international organisations.

Factors militating against the adoption and use of ICTs in Nigeria

The impact of ICTs in the socio-economic development of a nation has been emphasized in this study. ICTs are redefining the way we do almost everything and are a ready tool for all strata of society as much as for the president of any nation in government, as for the housewife in her daily chores, the teacher in his class, or the artisan in his trade. Yet, for several reasons, African countries like Nigeria have not yet fully realised those benefits. (Adeyeye and Iweha, 2005). From a number of similar studies and research, one discovers a common thread that runs through discussions on the different factors militating on the effective use of ICTs.

Nigeria is one of the largest economies in Africa and it is growing quickly, yet the country continues to face different political, economic and social crises as illiteracy, poverty, and the prospects for the Nigerian market for the internet are hindered by these challenges as well as by weak underlying infrastructure. Statistics reveal that there are over 45 million internet users in Nigeria, which on the surface appears to be a large number until it becomes apparent that this figure represents only 29 per cent of the entire population. (Ben Uzor, 2012; Pyramid Research 2010:16). However, favourable demographics, coupled with recent investment and growth suggest that these challenges can be overcome. (Olivier, et.al 2012:131).

Ogbomo and Ogbomo (2008:2-7), noted that the interview conducted on their study presented several factors that militate against the correspondents' use of ICT facilities: power blackouts, the high cost of connectivity and lack of ICT skills ranked highest. Nigeria has a population of about 150 million people, of whom 81 million do not have access to electricity. (Olivier, et.al, 2012:132). Low level inter-connectivity, poor infrastructure, urban-rural digital divide, lack of basic education, obsolete equipment and high cost of equipment are among the factors militating against the adoption and use of ICTs in Nigeria. Some other problems include lack of skilled human resources, economic constraints, low computer literacy and lack of systems infrastructures and applications. (Apulu and Latham, 2009:64-80).

There is also the problem of linguistic diversity coupled with relatively low education level which continues to hinder Nigerians' use of the internet, especially as regards to interpreting much of the internet's content. Nigeria ranks 142nd in the world with regard to literacy rate with literacy rate approximately 20% points higher in urban areas. Additionally, internet infrastructure, business engagement and financial systems appear limited in Nigeria. Bandwidth speeds are slow and secure data transfer can be difficult. (Olivier, 2012:132).

Most of the African respondents interviewed in a study carried out by Obijiofor, Inayatullah and Stevenson on the impact of new information and communication technologies on socio-economic and educational development of four African countries and two Asia-Pacific countries provided the following as a wide range of factors inhibiting the widespread introduction and use of new technologies:



- Ignorance about the importance of and need for ICTs which makes even those rich enough to acquire them apathetic to ICTs.
- General poverty which leads to perception of computers, for example, as alien and luxury acquisitions.
- Poor maintenance and repair culture in which spare parts and technical experts from the manufacturers are imported whenever the technologies break down; this leads to waste of resources, time and money.
- Poor infrastructural support base, examples include inefficiency of electricity and telephone systems.
- Lack of support from the government leading to under-funding of science and technology programmes in tertiary institutions.
- Illiteracy and lack of basic computing skills.
- Lack of a science and technology policy.
- The absence of true democracy which leads to political unrest and the unwillingness of foreign investors to invest in the area of ICTs.
- Perception of technologies (example computer) as a status symbol or statement of one's hierarchy in society.

Recommendations

The potential of information and communication technologies to drive socio-economic growth in developing countries is perhaps the most significant discourse in the development theory and practice in the last two decades and governments must show commitment to IT development and not just discuss it. ICT development should be one of the top most items on the agenda of any conference or programme organised to formulate policies and programmes on African development. ICT development is a huge project worthy of investment and African leaders, governments, policy makers and stakeholders need to show commitments to ICT improvement especially in the area of funding and adequate planning.

Nigeria, unfortunately falls under the category of countries that are yet to maximise the full potentials that ICTs provide for economic development despite her enormous social and economic potentials (unlike other African countries) which would have put her at an advantageous position if she had utilized the enormous natural resources for meaningful development. Nigeria, today, is a heavy consumer of ICT components without the capability to produce any. (Kajogbola, 2004).

Adeyeye and Iweha (2005), are of the view that countries like Nigeria must develop a vibrantly structured ICT policy backed with an appropriate legal framework and the confidence of financial institutions. Policies and strategies that support information infrastructure and skills development are critical to ensuring that equitable opportunities exist for the citizenry and foster stakeholders' collaboration. Also, implementation must be linked to local problems, specifically to poverty alleviation. This linkage must be direct, showing stakeholders the benefits of using ICTs for economic growth. (Obijiofor, et.al, 1999). Fostering stakeholders' collaboration in policy reviews and implementation will create an enabling ICT environment that would encourage public-private ICT partnership in the interest of the nation. (Adeyeye and Iweha, 2005).

There is need for urgent deliberate and practical regulatory and policy initiatives needed to ensure the attainment of the desired level of ICT growth and development in Nigeria, particularly in the broadband and data segment of the telecommunications sector of the Nigerian economy to enhance the contribution of ICT to the socio-economic advancement of Nigeria. The different avenues of using what analysts in the ICT industry call the "e-e-eeeeee-es" should be explored to facilitate the country's journey to its desired destination. (Ben Uzor Jr., 2012).

Nigeria is reported to be the second biggest mobile market in Africa behind South Africa and is rising at an astounding rate. In improving ICT usage in Nigeria, therefore, the Federal Government should draw a lesson from South Africa and consider improving the stability of the electricity supply since power is central to ICT development. Also, Nigeria has only one internationally recognized data centre compared with the 1,157 data centres of the United States, 167 data centres of the United Kingdom and South Africa which has 17 data centres. This is very unsatisfactory considering that a data centre is a facility used to house computer systems and associated components such as telecoms and storage systems and generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g. air conditioning, fire suppression) and security devices. (Ben Uzor Jr. 2012).



The imperative of computer education cannot be over-emphasized. (Kajogbola, 2004). There is also a need to encourage a robust ICT capacity development in the education sector by encouraging sponsorship of ICT projects by financial institutions and the integration of ICT into the curriculum. Implementation must also show how ICTs can transform education, making it far more interactive and empowering for students and professors/teachers. Access to the web must not only be inexpensive, but as much as possible be locally driven, based on local content. (Obijiofor, et.al.1999).

Nigerians who are ICT experts in the diaspora need to be encouraged to play active roles in Nigeria's ICT environment, particularly in infrastructure and human development. This would encourage local stakeholders to keep abreast of developments in the ICT world. (Adeyeye and Iweha, 2005).

Implementation must help transform users of ICTs in African region from consumers to producers of new knowledge and wealth. Dissemination of hardware must include software support, institutional linkages, and servicing. This must be done in the context of local cultural practices including those that inhibit ICT use (hierarchical institutional practices). (Obijiofor, et.al 1999).

Conclusion

There is no doubt that information and communication technologies (ICTs) are the bedrock for the survival and development of any nation because of their impacts on all sectors of the economy of a nation. Even with words of caution, there is now a considerable agreement among scholars regarding ICTs contribution to national growth and productivity as evidenced from countries in Africa which have made significant progress and recorded significant economic developments from investing in their ICTs sector like South Africa. Nigerian leaders still have a lot to do in the area of capacity building to create an enabling environment for development of ICTs in the country. There is thus, a call on African leaders and policy makers to address a host of issues which have presented as challenges in the adoption of these technologies to provide solutions to the myriad of problems facing the African continent.

Like Sanusi (2003:1) rightly noted, recent advances in digital technologies have separated further the divide between the rich and poor countries. Since there is no comprehensive solution for this problem within the current conventions, it is imperative that we explore the potential ways of utilizing digital technologies in empowering our people, alleviate poverty and for community to better perform their tasks and roles in our increasingly technologically driven, information centred and knowledge based economy. Can we afford the consequences of being left behind? The alternative becomes inevitable.

REFERENCES

- Achimugu, P. Oluwagbemi, O. Oluwaranti, A. and Afolabi B. (2009). Adoption of information and Communication technologies in developing countries: An impact analysis. *Journal of Information Technology Impact*, 9 (1), pp. 37-46.
- Adeyeye, M. and Iweha, C. (2005). Towards an effective national policy on information and Communication technologies for Nigeria. *Information Development*, Vol. 21, No. 3, August, Sage Publications.
- Africa and Middle East Telecom News (2012). Mobile, fixed and broadband news and data 1998-2012 Africa and Middle East Telecom Week. Available at: http://www.africantelecomnews.com/telecom_industry_overview_resources/Africa_opp_-_Nigeria.shtml Accessed 06/6/2012.
- Akpan-Obong, P. (2007). Information and communication technologies in development: Contextuality and Promise. *Proceedings of the 9th international conference on Social implications of computers in developing countries*, Sao Paulo.
- Akporfure, A.S. (1999). *Free expression in age of the internet: Social and legal boundaries*. Boulder: Westview Press.
- AllAfrica, Inc. (2006). *Pan-Africa: Internet connections growing fast in Africa*. Available: University of Maryland website, <http://www.researchport.umd.edu> Accessed 6/06/2012.
- Anyakoha, M.W. (1991). *Basic librarianship: Modern technologies in information work*, Place. Owerri: Totan publisher, pp. 106-108.
- Apulu, I. and Latham, A. (2009). Information and Communication Technologies Adoption: Challenges for Nigerian SMEs. *TMC Academic Journal*, 4 (2), 2009, pp. 64-80.
- Avgerou, C. (2010). Discourses on ICT and development. *Information technologies and inter-national development*, 6 (3), The London School of Economics and Political Science, pp. 1-18.
- Bassols-Lopez, V. (2002). ICT skills and employment. *ENSTI Working Papers, DSTI/DOC 10*, Directorate for Science, Technology and Industry, OECD Publications.
- Ben Uzor Jnr. (2012). Improving Nigeria's internet presence for economic prosperity. *Business Day*, 23 April, 2012.
- Crede, A. and Mansell, R. (1998). *Knowledge societies in a nutshell: Information technologies for sustainable development*. Ottawa, Canada: IDRC.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, 13, 983-1003.
- Djamen, J., Ramazi Duila and Some, Soteg, S. (1995). Electronic networking in Africa: Emergence towards the internet. *FID News Bulletin*, Vol. 45, No. 7/8, July/August, pp. 228-233.
- Draft White Paper on e-education (2003). Transforming learning and teaching through ICT. *Department of Education*, South Africa, August.
- Federal Republic of Nigeria 2001 national policy for information technology (IT). Available: www.nitda.gov.ng/nigeriapolicy.pdf. Madu2000 and Fapothunda1999.
- Hall, M. (1998). *Africa Connected*. peer-reviewed journal on the internet. Available: http://www/firstmonday.dk/issues/issues_3_11/hall/indexhtml.



- Hawkrige, D. (1983). *New information technologies in education*. London: Broom ReIm.
- Heeks, R. (2002). Information systems and developing countries: Failure, success and local improvisations. *The Information Society*, 18 (2), 2002, pp. 101-112.
- Heeks, R. (2002). "I-Development Not e-development: Special issue on ICTs and development", *Journal of International Development*, 14, pp. 1-11.
- Hobart, M. (ed.), (1993). *An anthropological critique of development*. London: Routledge.
- Human Development Report* (2001). *Making new technologies work for human development*. Oxford: Oxford University Press for the UNDP.
- Jegade, O.J. (1995). From talking drums to electronic networks: Africa's snail mobile through the cyberspace. *FID News Bulletin*, Vol. 45, No. 7/8, July/August 1995, pp. 218-224.
- Kajogbola, D.O. (2004). The impact of information technology on the Nigerian economy: A study of the manufacturing and services sectors in the South Western and South Eastern Zones of Nigeria. *ATPS Working Paper Series*, No. 39, published by the African Technology Policy Studies Network, Kenya, 2004.
- Kraemer, K.L. et al, (2009). One laptop per child: Vision vs reality. *Communications of the ACM*, 52 (6), pp. 66-73.
- Langinia, K. (2005). The Role of ICT in the economic development of Africa: The case of South Africa. *International Journal of Education and Development using Information and Communication Technologies*, Vol. 2, Issue 4, pp. 144-156.
- Madon, S. et al (2007). Digital inclusion projects in developing countries: processes of Institutionalisation. *Information Technology for Development*, 15 (2), pp. 95-107.
- Mansell, R. (ed.). (1994). *The management of information and communication technologies: Emerging patterns of control*. Science Policy Research Unit. published by the Association for information management, London, 1994.
- Marcelle, G.M. (1999). Getting gender into African ICT policy: A strategic view. In Rathgeber and Ofwona (eds.), (1999), *Gender and information revolution in Africa*, IDRC.
- Mariscal, J. Jose, A. Botelho, J. and Gutierrez, L. (2008). "Information and communication Technologies (ICTs) training, employment and youth: The case of Brazil, Columbia and Mexico. *Centre for Information and Society*, University of Washington, September, p. 11.
- McGrath, K. and Maiye, A. (2011). The contribution of ICTs to socio-economic development: Experience from Nigeria. *7th Critical Management Studies Conference (CMS7)*, Available: [McGrath_and_Maiye.pdf](#). Accessed. 2/06/2012.
- Moodley, S. (2003). The promise of e-development? A critical assessment of the state ICT for poverty reduction discourses in South Africa. *Perspectives in Global Development and Technology*, 4, 2003, pp. 1-29.
- Maake, M. (2012). Vast number of mobile users presenting big opportunity. Times Live Business 10 March, 2012. Available at: http://www.businesslive.co.za/business_exchange/2012/03/10.vast-number-of-mobile-users-presenting-big-opportunity, Accessed on 06/06/2012.
- Ndukwe, E. (2002). Application of information technology. *The Pointer*, 28 October 2002, p. 16.
- Nettel@Africa (2005). The potential uses of ICTs: ICT and growth of information sector. *Module 1*, chapter 2, pp. 10-75.
- Nigeria Development Collaborative, Gateway Deliverable Report* (2012). "Preliminary e-readiness assessment", February - April 2004, Available: www.NigeriaDevelopmentGateway.com, pp. 4-6. Accessed 28th May, 2012.
- Obijiofor, L.P. Inayatullah, S. and Stevenson, T. (1998-1999). Impact of new information and communication technologies (ICTs) on socio-economic and educational development of Africa and the Asia-Pacific: Private. *UNESCO sponsored study of four African countries and two Asia-Pacific countries*, January 1998 and April, 1999.
- Odedra-Straub, M. (1995). "Contemporary issues in electronic communication in Africa: A summary of the Addis-Ababa Symposium", *FID News Bulletin*, Vol. 45, No. 7/8, July/August, pp. 225-227.
- Ogbomo, M.O. and Ogbomo, E.F. (2008). Importance of information and communication technologies (ICTs) in making a healthy information society: A case study of Ethiope East Local Government Area of Delta State, Nigeria", *Library Philosophy and Practice* 1, Delta State University, Abraka, Nigeria. pp. 1-7.
- Olivier, N. Manyika, J. Bughin, J. Chui, M. Syed, A. (2012). *Online and Upcoming: The impact on aspiring countries*, South Africa: Mckinsey and Company.
- Orji-Okoro, M. (2006). Mobile telephony and sustainable livelihoods in Nigeria: Case studies from South East Nigeia. in: Iyoha, C.C. (ed.), (2006), *Mobile telephony: Leveraging strengths and opportunities for socio-economic transformation in Nigeria*, Lagos: Ezcell Communications Ltd., pp. 53-56.
- Pury, S.K. and Sahay, S. (2007). Role of ICTs in participatory development: An Indian experience. *Information technology for development*, 13 (2), pp. 133-160.
- Pyramid Research (2010). *The impact of mobile services in Nigeria: How mobile technologies are transforming economic and social activities*. Available: www.Pyramidresearch.com. pp. 1-19.
- Queau, P. (?). Governing the global knowledge society: UNESCO WebWorld points of view. Accessible: http://www.unesco.org/webworld/points_of_views/queau_9.shtml.
- Salawu, B. A. (2008). ICTs for sustainable development: The Nigerian experience. *Information, Society and Justice*, Vol. 12, June, Department of Applied Social Sciences, London Metropolitan University, London, pp.115-135.
- Rhodes, J. (2005). *Relating marketing and e-commerce to the local social appropriation of ICT*. Unpublished Phd Thesis, 2005, Department of Information Systems, University of Cape Town, South Africa.
- Sanusi, J.O. (2003). Special remarks on information and communication technologies (ICT) for The transformation of Nigeria. *National summit on SMIEIS*, held at the Federal Palace Hotel, Lagos, June 10, pp. 3-4.
- Stevenson, T. (1991). Telecommunications development in Asia-Pacific: The case for a new Australian role. *Telecommunications Policy*, December, pp. 485-490.
- Tiemo, P.A. (2006). Impact of global system of mobile (GSM) communication services on rural Communities in Delta State, in: Iyoha, C.C. (ed.), (2006). *Mobile telephony: Leveraging strengths and opportunities for socio-economic transformation in Nigeria*, Lagos: Ezcell Communications Ltd., pp. 90-99.
- Thioune, R.M.C. (2003). *Information and communication technologies for development in Africa: Opportunities and challenges for community development*, Vol. 1, Ottawa: IDRC. Available <http://www.idrc.ac>.
- Ukandu, E.A. and Nwajiuba, C.A. (2011). Mediating youth rural-urban migration through investment in information and communication technologies in South Eastern Nigeria. *Journal of Information Impact*, Vol. 11, No. 2, 2011, pp. 121-132.
- Ukandu, E.A. and Iroh, S. (2011). Influence of ICT in the rural-urban migration in Owerri Zone of Imo State, Nigeria. *Journal of Information Technology Impact*, Vol. 11, No. 1, pp. 51-58.
- UNDP (2000). *Development and international cooperation in the Twenty-First Century: The role of information and communication technology in the context of a knowledge-based economy*. Available: www.undp.org/info21.



- UNDP (2001). *World Report on Human Development 2001*, United Nations Development Programme, De Boeck University for UNDP, Brussels, Belgium.
- UNDP (United Nations Development Programme) *Human Development Report, 2010*. The real wealth of nations: Pathways to human development", Available: http://hdr.undp.org/en/media/HDR_2010_ENcomplete_reprint.pdf.
- United Nations Conference on Trade and Development (2005-2006). *The Digital Divide Report: ICTDiffusion Index, 2005*, United Nations: New York and Geneva, 2006.
- Wade, R.H. (2004). Bridging the digital-divide in the social study of information and communication technology. in: Avgerou C. et.al (eds.), *Social Study of Information and Communication Technology*, New York: Oxford University Press.
- Wangwe, S. (2007). A Review of methodology for assessing ICT impact on development and economic transformation. Contribution to the African Economic Research Consortium (AERC) project on the impact of ICTs on economic development and Transformation, p. 1
- Warschauer, M. (2003). Dissecting the 'Digital Divide': A case study in Egypt. *The Information Society*, 19 (4), 2003, pp. 297-304.
- Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. Cambridge: TheMIT Press.
- Wilson, M. (2001). *Information and communication technologies, development and the production of information poverty*. unpublished MPhil Thesis, 2001, International Development Centre, Oxford University.