

# The Effect of ICT on Federal Radio Cooperation of Nigeria

Showole A. A.,<sup>1</sup> Samson G. L.,<sup>2</sup> Usmam M. M.,<sup>3</sup> Atumoshi A. Y<sup>4</sup>

<sup>1</sup>Department of Computer Science, University of Abuja, Abuja  
*aminat.showole@uniabuja.edu.ng*

<sup>2</sup>Department of Computer Science, University of Abuja, Abuja  
*gracedyk@yahoo.com*

<sup>3</sup>Department of Computer Science, University of Abuja, Abuja  
*usmisi@yahoo.com*

<sup>4</sup>Department of Computer Science, University of Abuja, Abuja  
*atumoshi@yahoo.com*

**Abstract:** Information and Communication Technologies (ICT) developments have existed in Nigeria with a significant growth over the past decade. This paper looks at the role of emerging ICT on the general operations of Federal Radio Cooperation of Nigeria in achieving an objective of information decimation. This study shows that the ICT facilities have brought significant improvement to the FRCN service delivery which is important factor for growth and development in the society even though there are still some problems militating the use of ICT in the FRCN. The highest factor militating against the use of ICT is shortage of power supply followed by poor funding and lastly poor network facilities.

**Keywords:** Information Communication Technology; FRCN, Media

---

## 1. Introduction

Information and communications technology usually called ICT, is often used as an extended synonym for Information Technology (IT), but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), intelligent building management systems and audio-visual systems in modern information technology. ICT consists of all technical means used to handle information and aid communication, including computer and network hardware, communication middleware as well as necessary software. In other words, ICT consists of IT as well as telephony, broadcast

media, all types of audio and video processing and transmission and network based control and monitoring functions.

ICT is often used in the context of "ICT roadmap" to indicate the path that an organization will take with their ICT needs. The term ICT is now also used to refer to the merging (convergence) of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the audio-

**Corresponding Author:** Showole A. A

visual, building management and telephone network with the computer network system using a single unified system of cabling, signal distribution and management. This in turn has spurred the growth of organizations with the term ICT in their names to indicate their specialization in the process of merging the different network systems.

"ICT" is used as a general term for all kinds of technologies which enable users to create access and manipulate information. ICT is a combination of information technology and communications technology. [1] was first to use the expression ICT in his report to the UK government. In his report, he expressed the need to tackle the problem militating against effective communication, he iterated that there are also social and cultural factors which the media communication and the messages must overcome before such messages are accepted or rejected in traditional societies.

Against this background it was widely assumed that the mere presence of media communication led to the transformation of societies and individuals. [2] asserted that what was needed in this perspective was to change the attitudes, values and aspirations of the individuals in the population; from that would result the benefits of modernization with which such change was identified.

Advocates of ICTs points to how the western world experienced the impact of the information & communication technology and found it to be an indispensable tool of development. The belief was that if the ICT aided the social economic growth and development of the western nations, it should also propel socio-economic growth in developing nations. [3] explained that the technology is revolutionary", predicting that traditional methods of work, play, learning and commerce would be transformed, that people would carry out their activities in the comfort of their homes, and that the new technologies would provided now as to all problem.

In an increasingly interconnected world, the interactions among devices, systems, and people are growing rapidly. Businesses need to meet the demands of their employees and

customers to allow for greater access to systems and information. All of these communications needs must be delivered in a unified way. By offering a scalable infrastructure, cloud computing models enable companies to work smarter through more agile and cost-effective access to technology and information. This unified platform reduces costs and boosts productivity across a business and beyond. Part of an information and communications technology roadmap should involve consolidating infrastructures, while providing added benefits to users in collaboration, messaging, calendaring, instant messaging, audio, video, and Web conferencing. Cloud computing is driving more efficient IT consumption and delivery and taking ICT to the next level.

Information technology has taken over every aspect of our daily lives from commerce to leisure and even culture. Today, mobile phones, desktop computers, hand held devices, emails and the use of Internet has become a central part of our culture and society. ICT has made us a global society, where people can interact and communicate swiftly and efficiently.

### **1.1 Significance of ICT**

ICT is any technology that enables communication and the electronic capture, processing, and transmission of information. Radio, television and print media are vital in many developing countries.

There is widespread research interest in information and communication technologies (ICTs). According to [4], ICTs are crucially important for sustainable development in developing countries. [5] noted that for the past two decades 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. In a technology driven society, getting information quickly is important for both sender and receiver. ICTs have made it possible to quickly find and distribute information. [5] also indicated that many initiatives have taken at the international level to support

Africa's efforts to develop a communication infrastructure and these efforts are designed to enable African countries, including Nigeria, to find faster ways to achieve durable and sustainable development. [6], states that of the technological changes that have influenced our lives in recent years, information technology (IT) has had the greatest impact. 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. An information society is one that makes the best possible use of ICTs. [7] supports this view by describing it as a society in which the quality of life, as well as prospects for social change and economic development, depends increasingly upon information and its exploitation. In such a society, living standards, patterns of work and leisure, the education system, and marketplace are all influenced by advances in information and knowledge. This is evidenced by an increasing array of information intensive products and services [8].

[9] noted that the information society is a way for human capacity to be expanded, built up, nourished, and liberated by giving people access to tools and technologies, with the education and training to use them effectively. There is a unique opportunity to connect and assist those living in the poorest and most isolated regions of the world. To equip our society with Information technology is a major hurdle that most nations, especially developing countries, are encountering. The information society or information age is a phenomenon that began after 1950, which brings challenges as we seek to integrate and expand the universe of print and multimedia sources. The two terms are often used to describe a cybernetic society in which there is a great dependence on the use of computers and data transmission linkages to generate and transmit information [10].

[11] argues that Africa should build, by the year 2010, an information society in which every man, woman, child, village, public and private sector office has secured access to the use of computers and telecommunications media. The objective is to provide every African with the possibility of using the communication and data processing services

available everywhere else, just like any other citizens of the world.

One of the identified agents through which the world will constantly experience change is technology. In the business of trying to make information available in the right form to the right user both at the personal and organizational levels, and at the right time, the bid to cope with great flood of information has led to the need for a more sophisticated way of handling information faster and better. According to [12], information technology is "the use of manmade 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, manipulated or disseminated". [13] describes information technology as a revolution which has penetrated almost all fields of human activity, thus transforming economic and social life. [14] asserts that even if sustainable economic growth facilitates the creation and diffusion of useful innovations, technology is not only the result of growth but can be used to support growth and development. ICTs are credited with the ability to transform, and deep and significant changes are expected from their widespread use in Africa. From this stand point Africans can take maximum advantage of the new technologies even if major challenges remain. These challenges include 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. Therefore, development in Nigeria depends on the country's capacity to create wealth to significantly reduce poverty and to raise its capacity to create wealth at a sustainable level. In June 1996, the United Nations Commission on Science and Technology Development (UNCSTD) in collaboration with IDRC proposed five development indicators that focused on the improvement of the quality of life: education, health, income, governance, and technology. If we consider these five as key indicators of development for Nigeria, ICTs can be socially beneficial only if they contribute to poverty eradication (higher income), improved health and education, better use and more equitable

sharing of resources, and raising participation in the decision-making processes (and in this regard, access to information is crucial). 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 [15]. Surviving in the information age depends on access to national and global information networks. ICTs are the bedrock for the survival and development of any nation in a rapidly changing global environment, and it challenges us to devise initiatives to address a host of issues such as reliable infrastructure, skilled human resources, open government, and other essential issues of capacity building.

### **1.2 Uses of ICT**

The use of ICTs extends beyond equipping offices, homes, classrooms etc with computers and an Internet connection. There are a wide variety of ICTs currently available to our homes, offices schools and universities that can be implemented to enhance the society entirety in numerous ways. It is difficult to demonstrate that increasing access to ICT has a positive impact on development, when looking at the broader picture rather than at specific case studies. There is limited research in this area. Although such links have been established in developed countries (where, for example there is evidence of a link between telecoms development and economic growth) it is too early to observe this effect in developing countries. ICT has many social, environmental and economic impacts:

**Increase Networking Opportunities:** ICTs helps connect schools to other schools, offices to other offices as well as individuals within those places to one another.

**Provide Distance Learning:** With the advent of ICTs, learning has become Web-based. As a result, ICTs have started to replace correspondence schools.

**Increase sources of information:** ICTs helps provide an unlimited source of information for the working class especially those in the media sector.

**Enhance the spread information:** Telephones, TVs, Fax machines, Radios etc helps information to reach a wider range with a little or no time wasted.

**Intellectual Property Rights:** ICT can help disseminate indigenous knowledge (such as herbal medicine). However, by publishing such information on the internet the knowledge of the economically poorer may be exploited with no benefit to them.

**Employment:** ICT can take jobs from those who have previously benefited from their specialized knowledge, such as agricultural middlemen who know market prices. ICT does create new jobs, although they are likely to be quite different from the disappearing jobs.

There are a variety of career opportunities available for beginning and experienced ICT professionals. Computer Information Systems Manager oversees all technical aspect of an organization, such as software development, network security, and Internet operations. People who enjoy designing software programs might be interested in a career as a Computer Programmer Teamwork is essential for Computer Software Engineers, who might work with a large group to solve problems and create new products. Even those who travel or telecommute must typically report to a team or management structure. Database Administrators (DBA) use software to store and manage information. They also set up database systems and are responsible for making sure those systems operate efficiently. Statisticians collect data and analyze it, looking for patterns that explain behavior or describe the world as it is with the use of ICT facilities.

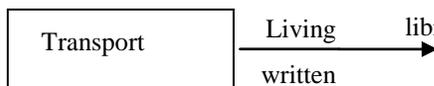
### **2.0 Media Communication Systems**

The challenge of radio media communications is to provide services that integrate text and sound information and to do it in a way that preserves the ease of use and interactivity. The

radio media communications is a field referring to the representation, storage retrieval and dissemination of machine-process able information expressed in the radio media, such as text, speech, audio, handwriting and data files. With the advent of high capacity storage device, powerful and yet economical computer workstations and high speed integrated service digital networks (ISDN), providing a variety of media communication services is becoming not only technically, but also economically feasible. In addition the broadband integrated services digital networks (BISDN) has been given special attention as a next generation communication network infrastructure that will be capable of transmitting high speed data at between 150 and 600mb/s (macro block per second), throughout the world [16].

The media information and communication technology best suits the human being’s complex perception and communicating behavior, as well as the way of acting. It not only provides communication capabilities and information sharing for people, irrespective of location and time, but also provides easy and immediate access to widely distributed information banks and information processing centers.

Applications in medicine, education, travel, real estate, banking, insurance administration and publishing are emerging at a fast pace. These applications are characterized by large media document that must be communicated within very short delays. Computer-controlled co-operative work, whereby a group of users can jointly view, create, edit and discuss media document, is going to be characteristic of many transactions. Some other glamorous application in media processing includes distance learning, virtual library access and living books. In distance learning, we learn and interact with instructors remotely across a broadband communications network. Virtual library access means that we instantly have access to all of the published materials in the world, in its original form and format and that we can browse, display, print and even modify the materials instantaneously. books supplements the



word and the associated pictures with animations and hyperlinks provides access to supplementary materials.

**2.1 Element of Media Information and Communication Systems**

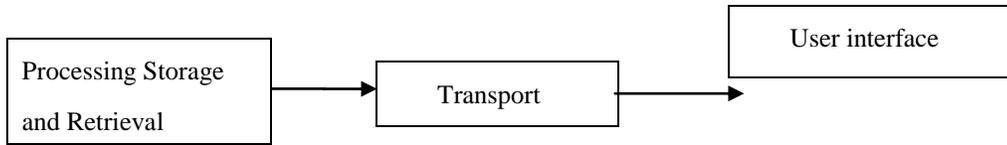
Media systems generally use two key communication modes which are -: person-to-person communications and person-to-machine communications. The figure 1 and 2 below presents key elements of media systems. As can be seen, both of these modes have a lot of commonality, as well as some differences.

In the person-to-person mode shown in the figure 1 below there is a user interface that provides the mechanisms for all users to interact with each other, and there is a transport layer that moves to the media signal from one user location to some or all other user locations associated with the communications. The user interface creates the media signal and allows users to interact with the media signal in an easy-to-use manner. The transport layer preserves the quality of the media signals so that all users receive what they perceive to be high-quality signals at each user location.

Examples of applications for the person-to-person mode are telephone conferencing, distance learning and shared workspace scenarios. In the person-to-machine mode shown in the figure 2.3 below there is again a user interface for interacting with the machine, along with a transport layer for moving the media signals from the storage location to the user. There is also a mechanism for storage and retrieval of media signals that are either created by the user or requested by the user. The storage and retrieval mechanisms involve browsing and searching to find existing media data. Also these mechanisms involve storage and archiving in order to move user-created media data to the appropriate place for access by others. Examples of the applications for person-to-machine mode includes creation and access of business meeting notes, access of broadcast data and documents archives from a digital library or other repositories.



**Figure 1:** Person-to-person communications



**Figure 2:** Person-to-machine communications [16].

## 2.2 Media Communication System Requirements

### 2.2.1 User Requirements:

The user needs a media communication system that prepares and presents the information of interest, allows for the dynamic control of applications and provides a natural interface. From a user's point of view, the most important requirements of media communications are the following -:

- Fast preparation and presentation of the different information types of interest, taking into account the capabilities of available terminals and services.
- Dynamic control of media applications with respect to connection interactions and quality on demand combined with user friendly human/machine interface.
- Intelligent support of users taking into considerations their individual capabilities.
- Standardization.

User requirements in terms of services are defined by the media, the transmission content and the type of communication, as well as the ability to combine the three.

### 2.2.2 Network Requirements

From the network point of view, the most important requirements of media communications are as follows-:

- High speed and changing bit rates.
- Several virtual connections using the same access.
- Synchronization of different information types.
- Suitable standardized services and supplementary services supporting media applications.

The requirements of applications regarding the communication services can be divided into traffic and functional requirements. The traffic requirements include transmission bandwidth delay and reliability. They depend on the used kind, number and quality of data streams. The traffic requirements can be satisfied by the use of resources management mechanisms. They establish a relationship between transmitted data and resources and ensure that the audio-visual data is transmitted in a timely manner. For this transmission of data, the information about the resource needs must be available at all nodes participating in the distributed applications, end systems and centers. Hence, resources must be reserved and states must be created in these nodes which basically mean that a connection is established [16]

### 3. Materials and Methods

This study was a survey, designed to elicit the effect ICT has on the media and FRCN in particular. It was to find out the level of improvement that ICT has created. It has been speculated that the total computerization of our media institutions which is commonly called the paperless technology in the FRCN has greatly improved the working conditions, the efficiency and also saved a lot of time not to mention the quality of work.

The study used the staff of FRCN according to their departments and the departments in particular are the News room, Studio, Library, Engineering, Finance, Programs, Administration, Marketing and Audit. The number of staff that answered the questionnaire was 56 who were made up of staff from every department in the FRCN.

#### 3.1 Instrumentation

The instrument for the study was the questionnaire. The questionnaire was designed to obtain information on the use of ICT targets, its effects as well as the challenges of the ICT in the FRCN. The questionnaire was therefore itemized to find out about years of service, educational qualification as well as computer literacy levels, other items includes the impact of the ICT, its challenges and probable solutions.

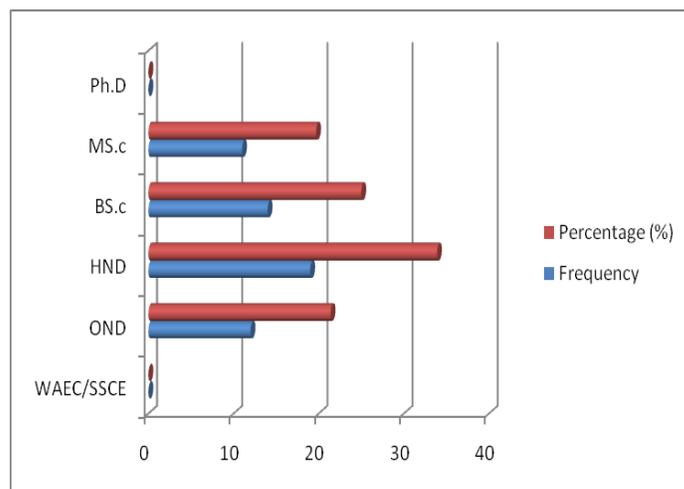
The statistical techniques used for the analysis of data in the study were the frequency and their corresponding percentages. This will ensure that a proper determination of the level of findings in order to reach an acceptable conclusion.

## 4. Results and Discussion

### 4.1 Staff Qualification

**Table 1:** Staff qualification

Staff Qualification	Frequency	Percentage (%)
WAEC/SSCE	0	0.0
OND	12	21.4
HND	19	33.9
BS.c	14	25.0
MS.c	11	19.7
Ph.D	0	0.0
Total	56	100.0



**Figure 3:** Staff qualification

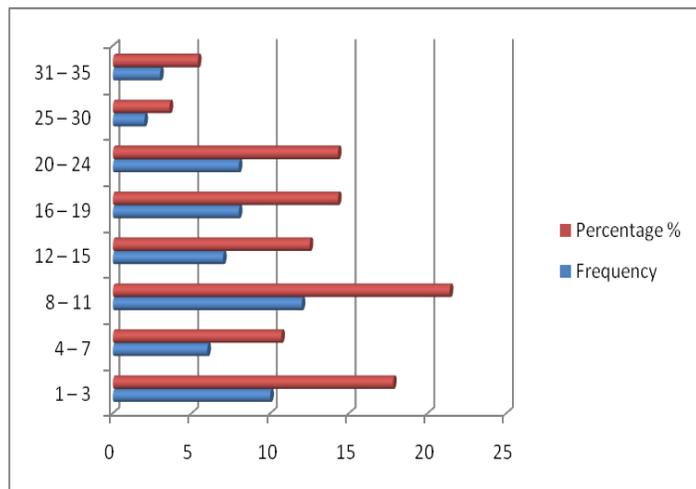
Tables 1 shows the characteristic of respondents by the staff qualification,

On the staff qualifications those with MSc were 11(19.7%), 14(25%) for the BSc, 19(33.9%) for HND, and 12(21.4%) for OND.

### 4.2 Staff Years of Work Experience

**Table 2:** Staff Years of work experience

Work Experience	Frequency	Percentage %
1 – 3	10	17.8
4 – 7	6	10.7
8 – 11	12	21.4
12 – 15	7	12.5
16 – 19	8	14.3
20 – 24	8	14.3
25 – 30	2	03.6
31 – 35	3	05.4
<b>TOTAL</b>	<b>56</b>	<b>100.0</b>



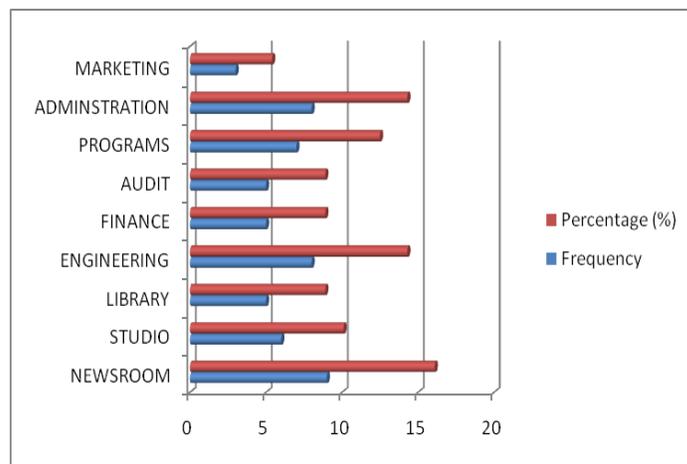
**Figure 4:** Staff years of work experience

Table 2 shows that those who had work experience of between 1-3 years were 10 (17.8%), 4-7 years 6(10.7%), 8-11 years 12(21.4%), 12-15 years 7(12.5%), 16-19 years 8(14.2%), 20-24 years 8(14.3%), 25-30 years 2(3.6%), 31-35 years 3(5.4%).

**4.3 Staff Department**

**Table 3:** Staff Department

Department	Frequency	Percentage (%)
NEWSROOM	9	16.1
STUDIO	6	10.1
LIBRARY	5	08.9
ENGINEERING	8	14.3
FINANCE	5	08.9
AUDIT	5	08.9
PROGRAMS	7	12.5
ADMINSTRATION	8	14.3
MARKETING	3	05.4
<b>TOTAL</b>	<b>56</b>	<b>100.0</b>



**Figure 5:** Staff Department

Table 3 shows that in the Newsroom, they were 9(16.1%), Studio 6(10.7%), Library 5(8.9%), Engineering 8(14.3%), Finance 5(8.9%), Audit 5(8.9%), Programs 7(12.5%), Administration 8(14.3%), Marketing 3(5.4%).

The research questions 1-3 were for the characteristics of the respondents while 4-10 were used for analysis.

**4.4 Research Question 4**

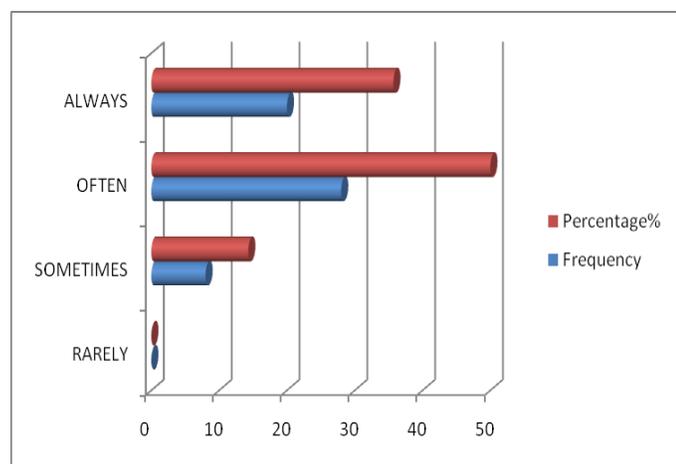
How often do you use ICT facilities?

This question was aimed at finding out the extent at which staff use the ICT facilities.

**4.4.1 Extent of use ICT facilities**

**Table 4:** Extent of use ICT facilities

Use of ICT Facilities	Frequency	Percentage%
RARELY	0	0
SOMETIMES	8	14.3
OFTEN	28	50.0
ALWAYS	20	35.7
TOTAL	56	100.0



**Figure 6:** Extent of use ICT facilities

Table 4 shows the frequency and percentages of how the ICT facilities are used. No staff was found that use ICT facilities only rarely in the FRCN, 8(14.3%) of the staff used it sometimes, 28(50.0%) of the staff used it often while 20(35.7%) of the staff used ICT facilities always.

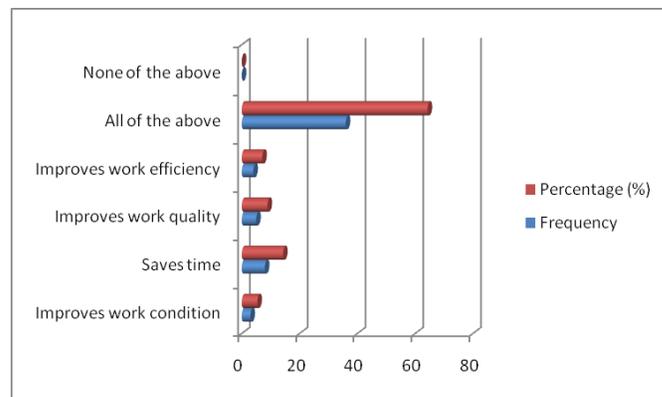
**4.5 Research Question 5**

What are the benefits of using ICT facilities in your office?

The question was aimed at finding the impact which the ICT facilities had on the FRCN.

**Table 5:** Benefits of using ICT

Benefits of the Use of ICT Facilities	Frequency	Percentage (%)
Improves work condition	3	05.4
Saves time	8	14.3
Improves work quality	5	08.9
Improves work efficiency	4	07.1
All of the above	36	64.3
None of the above	0	0
Total	56	100.0



**Figure 7:** Benefits of using ICT

For the improvement of work conditions it was 3(5.4%), time economy was 8(14.3%), 5(8.9%) said it improves work quality, 4(7.1%) said it improves work efficiency and 36(64.0%) said all of the above while no staff said none of the above.

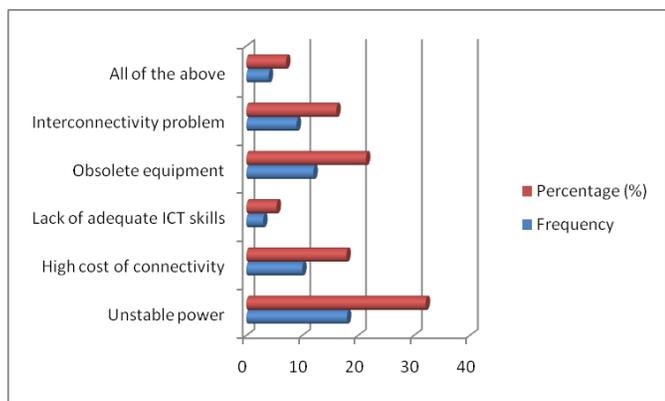
**4.6 Research Question 6**

What are the problems militating against the use of ICT facilities? The question was aim to find out the problems and obstacles of using ICT facilities.

**4.6.1 Problems militating the use of ICT**

**Table 6:** Problems militating against the use of ICT facilities.

Problems of ICT	Frequency	Percentage (%)
Unstable power	18	32.1
High cost of connectivity	10	17.9
Lack of adequate ICT skills	3	05.4
Obsolete equipment	12	21.4
Interconnectivity problem	9	16.1
All of the above	4	07.1
<b>Total</b>	<b>56</b>	<b>100.0</b>



**Figure 8:** Problems militating against the use of ICT facilities

Unstable power was found out to be the main problems militating against the use of ICT facilities as it had the highest percentage and frequency of 18 and 32.1% respectively, high cost of connectivity was 10(17.9%), lack of adequate ICT skills was 3(5.4%), obsolete equipments had 12(21.4%),

interconnectivity problems had 9(16.1%), while 4(7.1%) said all of the above.

**4.7 Research Question 7**

Have you ever had any form of ICT training?

The response to this question was unanimous as the staff all had one form of ICT training or the other.

**4.8 Research Question 8**

Have your organization ever organized any form of ICT training for its staff?

The response to this question was also a unanimous one as the FRCN had in some occasions organized ICT training for all its staff.

**4.8 Research Question 9**

Do you think ICT is relevant to the improvement of your work conditions?

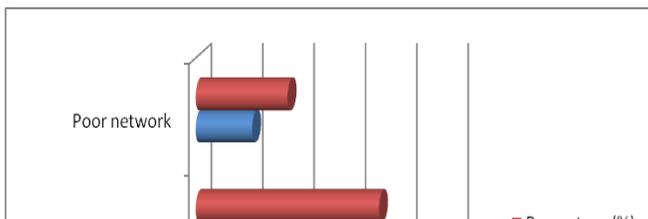
This question also had a unanimous answer as the staff all agreed that ICT had indeed improved their working conditions.

**4.10 Research Question 10**

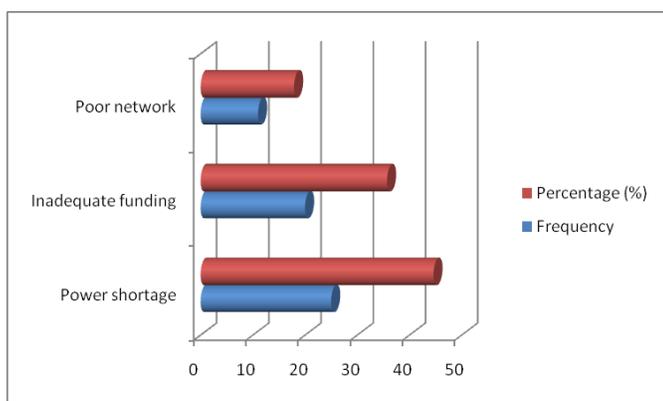
What do you consider the main challenges of the ICT in the FRCN?

The final question was set to find the main factors militating against the use of ICT facilities in the FRCN. Main factor militating the use of ICT

**Table 7:** The main factor militating the use of ICT



Main problem of ICT in FRCN	Frequency	Percentage (%)
Power shortage	25	44.6
Inadequate funding	20	35.7
Poor network	11	17.9
Total	56	100.0



**Figure 9:** The main factor militating the use of ICT

This question had 25(44.6%) of the staff saying the main problem was power shortage, 20(35.7%) went for inadequate funding while 11(17.9%) said poor network.

## 5. Summary, Conclusion and Recommendation

### 5.1 Summary

In discussing the importance of the ICT to the FRCN, some questions were asked through the use of questionnaires and 56 questionnaires were answered and the outcome of this has brought to light issues that could serve as lessons for the future.

The importance of the ICT in general cannot be overemphasized let alone its importance to the media and the FRCN in particular.

This study showed the significant improvement the ICT facilities brought to the FRCN and the media which is an important factor for growth and development in the society.

The investigations showed that all the Staff used the ICT facilities at one point or the other although some, according to the nature of work used, the ICT facilities more often than others which have improved the work condition and thus improved the work output unlike the times when the FRCN staff were still working manually and a lot of backlog of work for example in account and the audit department where there was a lot of numbers and computing to do and thus due to the manual method of work, delays were often encountered in getting results. The time wasting was not only the undoing as it was often accompanied with poor work quality which was highly counterproductive. Although the computerization of the media station brought about tremendous improvement in quality, efficiency and time management just to mention but a few, some factors still militated against it. These obstacles which the unstable power supply, high cost of connectivity, obsolete equipment, interconnectivity problem, just to mention but a few has been causing serious setbacks with the unstable power supply problem as the main problem which had the highest frequency and percentage of 18 and 32.1% respectively. This power problem which has not only been an obstacle to the FRCN but the country at large has caused great concern of which the Federal Government have been working tirelessly to fix.

Although there have been workshops and seminars to educate the staff on ICT uses and importance of ICT facilities as well as how to use them, there is still need for these workshops and seminars to be continuous so as to enable the staff meet up with the ICT industry due to the continuous improvement of the ICT gadgets and facilities.

This study showed that there had been an unanimous acceptance to the fact that ICT facilities has brought a great improvement to the working conditions and indeed the work output in the FRCN, these improvements which are obvious and undeniable cannot be overemphasized because the mass media which comprises of the Radio, TV, newspaper and magazines the regarded as drives of socio-economic development.

According to [17], no modern society functions efficiently without a developed system of mass media.

## 5.2 Conclusions

The study concluded that the effect of the ICT to the FRCN was tremendously great as the efficiency and output of work had improved and also the working conditions of the station. There were no adequate facilities to meet up with modern challenges in the ICT industry e.g. power supply, interconnectivity and modern equipment which are seriously distracting the progress and improvement of the ICT facilities.

## 5.4 Recommendations

In view of the findings of this study, it is hereby recommended as follows:

- 1) There is need for the improvement of the power supply which is the biggest problem militating against the effective and efficient use of ICT facilities.
- 2) Upgrade of ICT gadgets and facilities should be taken seriously due to the continuous advancement of the ICT industry.
- 3) Workshops, seminars and symposiums should be done to educate the staff on the use of ICT facilities and it should be continuous event.
- 4) The problem of connectivity should be checked by the government with laws that will compel service providers to cut down the cost of connectivity and to be friendlier with themselves and improve interconnectivity between different service providers.

## References

- [1] S.Dennis (1997). The independent ICT in schools commission; Information and communications Technology in UK schools, an independent inquiry. Available at [http://foldoc.org/information and communication technology](http://foldoc.org/information_and_communication_technology)
- [2] L.Shore, "Mass Media for Development: A Reexamination of Access, Exposure and Impact," in McAnany, Emile G. (ed.) P.89, 1980
- [3] S Kryish,. "Here comes the revolution – again: evaluating predictions for the information superhighway, Media Information Australia, Vol. 74, November, pp. 5-14, 1997
- [4] A., Crede, & R Mansell,. (1998). Knowledge societies... in a nutshell: Information technologies for sustainable development. Ottawa, Canada: IDRC.P.11
- [5] R. Thioune,. (2003). Information and communication technologies for development in Africa: Opportunities and challenges for community development. Volume 1. Ottawa: IDRC. Available at: <http://www.idrc.ca>
- [6] A. S Akpore,. (1999). Free expression in age of the Internet: Social and legal boundaries. Boulder: Westview Press.P.22
- [7] J.W Martin,. (1995). The global information society. England : Aslib, P.3. AISI Connect Online Database. Available: [www.paradigm.snipc.org.africa/index.htm](http://www.paradigm.snipc.org.africa/index.htm)
- [8] J.W Martin,. (1988). The information society. London: Aslib, P.179. AISI Connect Online Database. Available: [www.paradigm.snipc.org.africa/index.htm](http://www.paradigm.snipc.org.africa/index.htm)
- [9] K Annan,. (2002). Information and communication development: Information society summit. P.7.
- [10] O. Bruce, (1995). Internet with a difference: Getting people hooked up. Available: [www.zwren.org.zw/publications/information](http://www.zwren.org.zw/publications/information)
- [11] African Information Society Initiative (2005). AISI Connect Online Database. Available: [www.paradigm.snipc.org.africa/index.htm](http://www.paradigm.snipc.org.africa/index.htm)
- [12] M.W Anyakoha,. Basic librarianship: Modern technologies in information work. Owerri: Totan publisher, Pp. 106-108, 1991
- [13] D.Hawkrige, (1983). New information technologies in education. London: Broom Relm, P. 161.
- [14] UNDP (2001). World report on human development 2001. United Nations Development Programme. De Boeck University for UNDP, Brussels, Belgium. P.334
- [15] E Ndukwe,. (2002). Application of information technology. The Pointer, 28 October, P.16.
- [16] K.R., Rao, Zoran B. and A Dragorad. Milovanovic pp4-8
- [17] D Lerner,. (1958) The passing of Traditional society. Glencoe, Illinois: The Free Press.P.32
- [18] Federal republic of Nigeria (2001). Nigeria national policy for information technology (IT). Available: [www.nitda.gov.ng/nigeriapolicy.pdf](http://www.nitda.gov.ng/nigeriapolicy.pdf).Madu2000andFapothunda1999
- [19] Idisi P. and Oshonebo (1998). Practical Guide to Thesis and Project Work: Joyce Printing and Publishing Co. Kaduna Nigeria.
- [20] Lerner, D. and Schramm, W. (1976) "Looking Forward", Communications and Change: The last ten years – and the next. Honolulu, The University Press of Hawaii. P.55-57
- [21] Oliver, R. (2002). The Role of ICT in Higher Education for the 21st Century: ICT as a Change Agent. University, Perth, Western Australia. Available at

[http://wikipedia.com/information and communication technology](http://wikipedia.com/information%20and%20communication%20technology)

[22] Pye, L. W. (1963) "Introduction," in Pye, Lucian W. (ed.) *Communications and Political Development*. New Jersey: Princeton University Press. P.16