The Panos Institute West Africa

Radio and ICT in West Africa: Connectivity and Use

Institut Panos Afrique de l'Ouest

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Countries targeted:

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Senegal, Sierra Leone

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The Panos Institute West Africa (PIWA) is an independent international and secular non-governmental organisation, established in January 2000. From its headquarters in Dakar, PIWA carries out its work across West Africa and is represented or has correspondents in most countries in the region.

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ICT Programme publications

- *Ouvrir le débat sur le Forum sur la Gouvernance de l'Internet en Afrique: Plus de 90% des problèmes sont liés à l'Afrique elle-même,* C. Dzidonu, M. Chango, P. Dandjinou, G. Zongo, et. al, PIWA, 114 pages, French version available, April 2007.
- *Enjeux et usages des TIC en Afrique : les médias entrent dans le débat,* April 2007, PIWA, 267 pages.
- *Ecrire sur les TIC et la lutte contre la pauvreté,* Isidore Vierra, Maurille Sètondji, PIWA, December 2006, 43 pages.
- *Enjeux de gouvernance : Evaluation de la partipation de l'Afrique et de son secteur privé au SMSI : Synthèse ;* Karim Sy, Sylvie Javelot, Patrick Mathieu, et. al., Panos Institute West Africa, August 2006, 110 pages. French version available.
- *Development of Local Internet Traffic in West and Central Africa and Beyond: Synthesis of an e-discussion* November 2005 - French version available.
- *Universal Service and Access Trends in West and Central Africa: Case Studies and Prospects,* Aboubacar HAMAN, Panos Institute West Africa (CIPACO Project), December 2005, 119 pages - French version available
- *Comprendre et traiter la société de l'Information,* Abib NDAO, Panos Institute West Africa, Faits et documents (coll.), December 2003, 217 pages.
- *Ecrire sur les enjeux des TIC,* Alain Just COLY, Panos Institute West Africa, June 2005, 48 pages.

Other programme publications

- *Le pluralisme télévisuel en Afrique de l'Ouest / État des lieux, Mactar Silla, PIWA, May 2008, 196 pages.*
- *Analyse quantitative et économique de la pauvreté,* Dorothée BOCCANFUSSO, Samuel Tambi KABORE, Panos Institute West Africa, Faits et documents (coll.), June 2005, 274 pages
- *Media à l'école : manuel de l'enseignant, guide d'encadrement,* Ndiaga LOUM, Michel SENECAL, Panos Institute West Africa, July 2005, 164 pages.
- *Heeding the voiceless: a guide to using Oral Testimonies for radio documentaries*, Ibrahima Sané, Johan Deflander, Panos Institute West Africa, March 2006, 86 pages
- *Manuel de financement des radio communitaires*, Abdoulaye Traoré, Panos Institute West Africa, August 2006, 94 pages.

Contents

Overview

Radio remains the most appropriate communication medium for social and development communication in Africa. This study consists of carrying out a base-line study of West African radio connectivity to ICT (internet, satellite, computer, digital storage tools, etc.), analyzing the uses implemented, identifying the constraints and opportunities, and making recommendations to the different stakeholders. The study concentrates on seven (7) targeted countries (Ghana, Benin, Senegal, Mali, Sierra Leone, Burkina Faso & Niger) and concerns all radio stations (public, community, commercial and religious). Two hundred and twenty (220) radio stations took part in the survey. The main tools of research used were questionnaires, interviews and documentary analysis.

The results reveal that overall the average rate of access to the internet by radio stations in the seven (7) countries studied is 51.8 %, with a large disparity according to the country and type of radio. Indeed, while the rate of connectivity is 72.2% for private commercial radio on the one hand, it is limited to 31.5% for community or non-profit making radio. On the other hand, at a country-wide level, Ghanaian radio has a 93.5% connectivity rate, Senegalese radio 89.7%, whilst only 20% of radio stations in Sierra Leone are connected. In Ghana and Senegal, nearly all commercial radio stations are connected. In addition, 72.7% of Senegalese community radio stations have access to the internet (75% of them have an ADSL line), in contrast to only 8.3% of Nigerien community stations. The rate of connectivity for all radio stations in Burkina Faso, Benin and Mali, is 61.5%, 55% and 34% respectively.

It is thanks to ADSL technology that the majority of stations in the sub-region are connected, in particular Senegal, where more than 92 % of stations have access to the worldwide network. As illustrated by the cost of internet access, in certain countries internet use has become more and more accessible, but is limited to regions with good infrastructure.

The strong mobile phone penetration on the continent allows stations to use it as an indispensable tool for reporting and communicating with listeners; this has contributed to today's large number of radio listeners.

Even though around seventy (70) radio websites have been identified (the majority of them with domain names matching the names of the stations), their presence remains minimal and precarious on the internet. In most countries, live broadcasts on the internet are very unstable (streaming is usually inaccessible) or non-existent,

despite being advertised. In addition, a large number of websites have very few - or even no - content. Senegal and Ghana are the two countries where radio stations have the greatest number of websites, but direct broadcasting on the internet is much more stable on Ghanaian radio. Their presence on the web illustrates again that it is these two countries whose radio stations gain the most from ICT.

Moreover, mobile value-added services, in particular SMS, used by 83.8% of stations surveyed, have had great success amongst the local population. These new services are considered important tools of interaction between radio stations and listeners and are also a potential source of substantial revenue for radio business.

The level of IT equipment and use of digital supports (CD, DVD, media players & recorders, USB keys) remains average in the sub-region. As it happens, the poor level of IT equipment and digital supports is notorious amongst community radio stations which are generally based in rural zones with limited financial resources. In fact 33.6 % of them do not have computers. Free software has not had much success either with only 38% of radio stations using it. This kind of software is generally used for production, which still remains analogue for 36.36 % of radio stations.

Overall, satellite is very little used by radio stations. It is used mainly for receiving programmes. Community radio stations use it the most (57.7%), whilst this figure is 28.8% for commercial radio. The high rate of use of satellite by community radio stations is explained by the international support from which the stations benefit. Concerning broadcasting programme by satellite, it is almost only public radio stations - having substantial public subsidies - that are able to use it, in particular to Africa, Europe and the USA.

Convergence between ICTs and radio has brought about results including new multi-use supports which contribute to making radio programmes accessible everywhere throughout the world, and whose coverage, until recently was limited by FM transmitter capacity.

The study has shown that in the countries concerned, training in ICTs is not done regularly. In fact, a quarter of the radio stations surveyed stated that their employees have never followed any training. This explains the low level of ICT skills which greatly limits the development of digital products and services in radio stations. Due either to a lack of information or familiarity with ICT, it has also been observed that there is some confusion between free and proprietary software, and even about what kind of internet connection the radio station has.

Training needs remain huge and concern all of ICT, especially digital production, basic use of computers, the Internet and the creation or maintenance of advance broadcasting services and downloading on-line. Power cuts are cited in particular as a real obstacle in countries having the best connectivity.

National programmes capable of supporting radio station connectivity are rarely appreciated or recognised as effective. The RASCOM satellite, which represented a lot of hope for African countries, in the end had a lot of difficulties which prevented them from being really able to contribute to the development of access and opening up of rural regions to the outside world. Radio broadcasters are now counting on the extension of SAT3/SAFE cable and to a certain extent, on the consolidation of international projects such as Community Multimedia Centres, to develop access to the internet.

The lack of awareness of possibilities offered by ICT and the lack of financial, human and technical resources have considerably limited the development of uses linking ICTs and radio. Some innovative experiments have been noted and presented in the report, showing that it is indeed possible to extend the broadcasting range of radio stations using the Internet or satellite, and using interactive value-added services to increase radio station revenue and increase interaction with listeners, if basic problems of access to networks are resolved or improved.

List of acronyms

AAU	:	Association of African Universities
ACCT	:	Agence de Coopération Culturelle et Technique
ADSL	:	Asymmetric Digital Subscriber Line
ARTP	:	Agence de Régulation des Télécommunications (Senegal)
BBC	:	British Broadcasting Corporation
CDMA	:	Code Division Multiple Access
CIC	:	Community Information Centres
CIDA	:	Canadian International Development Agency
CLIC	:	Centre Local d'Information et de Communication
CMC	:	Community Multimedia Centre
CNEAM	:	Comité National de l'Egal Accès aux Médias d'Etat
CNRA	:	Conseil National de Régulation et de l'Audiovisuel (Senegal)
CRT	:	Centre de Régulation des Telecommunications
CSC	:	Conseil Supérieur de la Communication (Mali)
DAT	:	Digital Automatic Tracking
DL	:	Dedicated Line
DSF	:	Digital Solidarity Fund
DSTV	:	Digital Subscriber TV
ECOWAS	:	Economic Community of West African States
FAO	:	Food and Agriculture Organization
FETEMA	:	Fédération des Télécentres Communautaires du Mali
FM	:	Frequency Modulation
GBC	:	Ghana Broadcasting Corporation
GBS	:	Gateway Broadcast Service
GHASTINET	:	Ghana National Scientific and Technological Information Network
GJA	:	Ghana Journalists Association
GPRS	:	Global Packet Service Radio
HAAC	:	Haute Autorité de l'Audiovisuel et de la Communication (Benin)
ICT	:	Information and Communication Technologies
IMC	:	Independent Media Commission (Sierra Leone)
IRDC	:	International Research & Development Centre
ISP	:	Internet Service Provider
ITU	:	International Telecommunication Union
LMW	:	Last Mile Wireless

LOSI	:	Loi d'Orientation sur la Société de l'Information
MCNT	:	Ministère de la Communication et des Nouvelles Technologies de l'Information (Mali)
MMS	:	Multimedia Messaging Service
NATCOM	:	National Telecommunications Communication (Sierra Leone)
NCA	:	National Communications Authority (Ghana)
ODEP	:	Observatoire de la Déontologie de la Presse
ONATEL	:	Office National des Télécommunications (Burkina)
ORTM	:	Office des Radios et Télévisions du Mali
PADIS	:	Pan African Development Information System
PCMCIA	:	Personal Computer Memory Card International Association
PIWA	:	Panos Institute West Africa
PSTN	:	Public Switched Telephone Network
REMAJEF	:	Réseau Malien de la Jeunesse Francophone (Malian network of French-speaking Youth)
RFI	:	Radio France Internationale
RIU	:	Research In Use
SLBS	:	Sierra Leone Broadcasting Service
SMS	:	Short Message Service
SONATEL	:	Société Nationale des Télécommunications (Senegal)
SONITEL	:	Société Nigérienne de Télécommunications
SOTELMA	:	Société des Télécommunications du Mali
TTC	:	Technology Transfer Centre
T-DAB	:	Terrestrial Digital Audio Broadcasting
TDS	:	Talking Drum Studio
UNDP	:	United Nations Development Programme
UNICEF	:	United Nations Children's Fund
UNIDO	:	United Nations Organisation for Industrial Development
URTEL	:	Union de Radio et Télévisions Libres
USB	:	Universal Serial Bus
UUCP	:	Unix to Unix Copy Protocol
VOA	:	Voice of America
VSAT	:	Very Small Aperture Terminal
WAEMU	:	West African Economic and Monetary Union
WB	:	World Bank
WIMAX	:	Worldwide Interoperability for Microwave Access
WSIS	:	World Summit on the Information Society

Introduction

The Second World War marked a decisive turning point in the history of radio broadcasting in West Africa. With the exception of Ghana and Senegal, most of the countries in the sub-region only became acquainted with radio after the war. In fact, in 1935, a radio station controlled by the government Department of Information started broadcasting in Ghana, and in Senegal *Radio Dakar* was set up in 1939 for the particular needs of the army, with the transmission of information bulletins. It was only after the 1950s that Africans really started to become familiar with radio when transistor radios became more accessible.

Radio Cotonou (Benin) was created in 1953, R*adio du Niger* in 1958 and *Radio de la Haute Volta* (now Burkina Faso) in 1959. *Sierra Leone Broadcasting Service (SLBS)* in Sierra Leone also started broadcasting in the 1950s.

Following independence, most of these facilities were gradually transferred over to countries as they became independent. In fact, the control of radio services remained exclusively monopolized by the state until the 1980s.

The opening up of media space came about in the 1990s in most West African countries with the creation of private, commercial and community radio stations broadcasting on FM. In fact, the popular expression of people's political, cultural and linguistic diversity has resulted in creating radio pluralism in the media landscape of countries.

In just a few years, radio has become the most widespread mass communication tool in Africa, an essential vehicle for strategic development.

Today, the development of Information and Communication Technologies (ICTs) has considerably transformed the radio sector. Indeed, important innovations have appeared not just in transmission and broadcasting techniques, but also in listening, recording and editing supports.

Most of those working in the audiovisual field have seen the core of their work undergo changes and as a result are forced to find new approaches and ways of working to keep pace with the new environment.

The changes brought about by the convergence of the ICT and radio sectors are not just limited to how radio works, they also have an impact on the way programmes are received by listeners. In order to further solidify the important

social and educational role played by radio, it has become essential to measure the impact of ICTs with regards to the overall working of radio stations, how they are used and the resulting constraints and perspectives.

Research in this field is of great interest to PIWA, as it aligns with the overall mission to support the production and dissemination of content produced by and for radio, in particular community radio.

The study follows two previous studies conducted by PIWA in 2001 and 2003, which explored radio connectivity to ICT.[1] If emphasis was previously placed on community radio stations, the current study targets all radio stations. The scope of the research has also widened, in terms of the number of radio stations taking part; recommendations linked to the way surveys are carried out have been taken into account. Thus, from interviewing a few radio presenters in 2001, a study involving questionnaires given to 32 community radio stations in 2003, the methodology used here targeted more than 200 radio stations (of which about a hundred (100) were community stations), involved seven (7) countries, and include several research tools: interview, on and offline questionnaires, documentary research and focus groups to a lesser extent.

Whether speaking of connectivity or usage, the results show some improvement, even if it is not uniform (depending on the type of radio station or country) and in addition, varies according to different factors (on-line presence, availability of connection, type of connection etc.). However, the problems remain enormous and incapacitating. We hope that this study will contribute to recognising that the great potential brought about by communication and radio digital technologies can be transformed into a decisive vector for socio-economic development and social justice in Africa.

Our thanks go to all the radio stations who were kind enough to reply to our consultants' requests, to the consultants themselves, as well as our international partners whose support allowed this document to be made possible.

1. See *Deflander J., Attias, L. 2001, L'usage d'internet au sein des radios communautaires : les autoroutes de l'information ne sont pas encore goudronnées (Use of the internet within community radio: the information highways have not yet been tarmaced)* PIWA, Radio Unit and *Les médias et Internet en Afrique de l'Ouest*, PIWA, 2004.

1

Objectives and scope of the study

1.1 - Objectives of the study

The objectives of this study are the following:

a) To carry out a base-line study on West African radio connectivity to the Internet and satellite, based on research undertaken in seven (7) targeted countries (Ghana, Benin, Senegal, Mali, Sierra Leone, Burkina Faso, Niger);

b) To identify and analyse the constraints hindering radio connectivity to the Internet, satellite and the use made of ICTs in general;

c) To carry out a base-line study on the use made of other digital tools such as CD ROM, USB keys, audio-digital production software and free software en general;

d) To identify innovative use in combining new technologies and radio (such as innovative use in Community Multimedia Centres, web-radio, on-line broadcasting of audio files) and to highlight factors to consider in their implementation;

e) To identify needs in terms of ICT capacity strengthening of radio stations, as well as the relevance of this need;

f) To draw up recommendations for the attention of different stakeholders.

1.2 - Scope of study

The study covers West Africa in general. Seven (7) national surveys were carried out in the following countries: Ghana, Benin, Senegal, Mali, Sierra Leone, Burkina Faso and Niger. In each of these countries, a co-ordinator was in charge of leading the study and producing a national report.

2

Methodology

2.1 - Sampling Method

The choice of sampling in each country was done based on the total number of national radio stations actually in service, the type of radio station and their geographical distribution. Around 240 questionnaires were completed initially and a total of **220** (corresponding to 220 radio stations) were selected to reach an overall representative sampling.

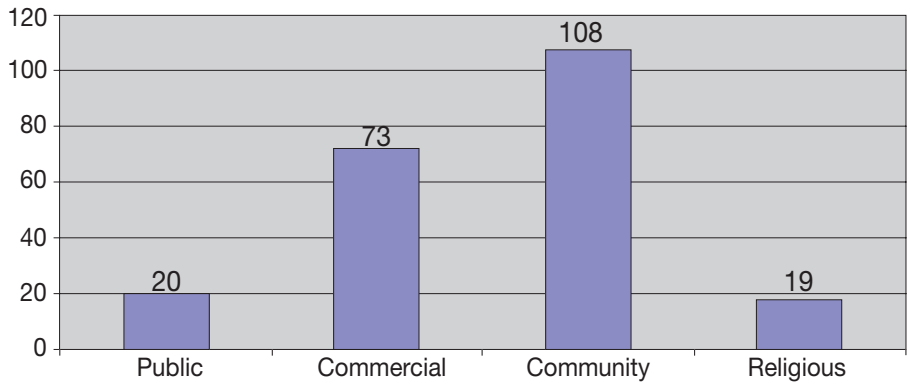
The number of radio stations selected appears as follows:

- Benin : 20
- Burkina Faso : 26
- Ghana : 31
- Niger : 32
- Senegal : 29
- Sierra Leone : 30
- Mali : 52

It should be added that the percentage of radio stations taking part in this study is quite significant. Indeed, in relation to the number of radio stations in service in each country, the sampling represents 32% of stations in Benin, 36% in Burkina Faso, 24% in Ghana, 21% in Mali, 28% in Senegal, 55% in Sierra Leone and 23% in Niger.

A breakdown by type of radio station in the sampling analysed is as follows:

Graph 0 : ***Breakdown by type of radio station surveyed***



2.2 - The collection of data

A questionnaire was designed and validated in conjunction with national coordinators based on content described in the terms of reference. This questionnaire was available as an electronic file and also directly through the online platform **www.surveymonkey.com**[2].

Several methods were used to allow radio stations to complete the questionnaire according to the type of access available (Internet, telephone, route,etc):

- form completed directly through the online electronic platform, by some radio stations who had an internet connection or who used an internet café;
- questionnaire completed off-line by management in radio stations which was sent electronically (via e-mail, USB key, disk), then returned to national coordinators who were responsible for recording it on the electronic platform;
- A form completed by national coordinators (after discussion with heads of radio stations), by telephone or face-to-face, and then uploaded on the electronic platform;
- printed form and sent through an intermediary to heads of radio stations (in the case where they were in very remote areas), then returned to the national coordinators, through an intermediary if necessary.

An interview guide was also produced for interviewing ten (10) key actors in each country (of which generally six (6) were radio operators using value-added ICT services, two (2) major radio operators without Internet connectivity in their head office; a media support organisation and a senior figure from the Ministry responsible for radio/communication in the country concerned). The interviews undertaken were used to collect qualitative or detailed information on ICT use. The radio stations interviewed also completed the on-line questionnaire.

These interviews allowed more detail on perspectives and innovative projects to be added to the information already given in the questionnaire.

The study is backed up by documentary research concerning each country and at a regional level, also allows information to be collected on the information and communication technologies and radio broadcasting sectors, with up-to-date statistical data.

2. SurveyMonkey is a software platform which allows professional on-line surveys to be carried out quickly and easily, with both free and paying options. It has a powerful survey designer with different options to use several types of data (multiple fields, matrix of choices, boxes to tick, etc.). This tool is well known internationally for on-line surveys. Other on-line survey platforms exist.

It was sometimes impossible, given time constraints, to reach radio stations in very isolated areas and certain heads of radio stations contacted were unable to complete the questionnaire or send their response for various reasons. In some rare cases, radio presenters sufficiently aware of the issues concerning the radio replied to the questionnaire, in place of radio heads who were unavailable.

Before analysing the data collected, conformity testing were carried out in some cases, particularly to check the consistency of responses. When necessary, some radio stations having completed the questionnaire, were contacted again by the regional coordinator for further detail or to clear up any ambiguities which had arisen. Some questionnaires, found to be too ambiguous or inconsistent in their replies, were eliminated during this process.

The response rate for each of the questions was at least 90%.

2.3 - Observations about the on-line survey

The study concerns West African countries overall, and is concerned with radio stations with Internet access as well as those with none. In this context, the use of an electronic platform on the Internet could thus be a limiting factor.

In order to overcome this problem, most of the questionnaires were completed on paper and delivered to national coordinators by post, fax, mail or in person. The questionnaires for community radio stations in remote areas in Mali were delivered by couriers. The difficulty of access was also overcome in Niger by organising a focus group, as well as a meeting of community radio stations in the capital, in order to complete a certain number of questionnaires.

The SurveyMonkey platform was then used by most of the national and regional coordinators to gather together the data coming from each country, and to generate national and regional statistics in the required format.

3

The radio landscape in West Africa

The radio landscape in West Africa was dominated by state public radio stations for over three decades, with quite limited coverage initially. Gradually, public regional radio stations were created to encourage national coverage of the territory.

At the same time as state radio stations, foreign networks with diversified content were also appearing. They were listened to in particular by a fraction of the elite, as broadcasting in a foreign language was not understood by the majority of African listeners.

From the 1990s onward, the wave of democratisation blowing across Africa was to bring to an end to state monopolization of the media and encourage liberalisation of the air waves on the continent. Across the continent, the first private commercial and community radio stations were established both in towns and the country, with a new type of community-based communication.

These radio stations were to have real success in allowing the discovery of the virtues of freedom of expression and encouraging a balanced treatment of the news. These innovations in radio communication as well as the prompt transmission of information greatly appealed to people. They were to complement or sometimes compete with radio stations in the public sector and introduce a new approach to radio production by ushering in an era of real community-based communication thanks to the use of national languages and information and communication technologies (ICTs), in particular the telephone and automated programming.

Today, the radio landscape of six (6) of the seven (7) countries targeted in the study (Burkina Faso, Benin, Mali, Senegal, Niger and Sierra Leone) is greatly dominated by community radio stations which are the expression of people's hope for democracy and freedom of speech. In contrast, in Ghana, commercial radio remains dominant. The diversity of the radio landscape encourages the strengthening of local democracy and the raising of the collective consciousness. If private radio stations exist in almost all towns, community radio stations are more widespread in rural areas.

3.1 - An overview of the radio landscape in Burkina Faso

The radio landscape of Burkina Faso is rich and varied. Indeed, while there was only one national public radio station immediately after independence, the country has seen a proliferation of all kinds of radio stations since the 1990s.

The progressive rise of radio in Burkina Faso dates back to the1950s[3] with the creation of *Radiodiffusion de Haute Volta (Upper Volta Broadcasting)*. *Radio Bobo* opened in 1962,[4] followed by rural radio in 1969, radio stations (Gassan, Diapaga, Orodora, Kongoussi, Poura and Djibasso) between 1986 and 1993. All of these stations were state-run.

Private radio emerged in the early 1990's with the opening of *Radio Horizon FM i*n December 1990,[5] which from 1992 became a network of radio stations in each of the country's several large towns, including Bobo Dioulasso, Ouahigouya, Kaya, Dori, etc.

Following this first private FM radio station, other radio stations came to being, among which *Radio CAC* (Canal Arc En Ciel – Radio Rainbow in English) became the FM equivalent for national radio. With this liberalisation of the radio waves, many other promoters opened private, commercial, community or religious FM radio stations in Ouagadougou as well as the interior of the country.

Geographically, if state radio stations only covered a very small part of national territory, the divide in radio geographical coverage was quickly overcome by liberalisation. Thus, each region in Burkina Faso today has at least one radio station. The majority of radio stations are in Ouagadougou and Bobo Dioulasso, mainly because of administrative and economic activity, and their large populations.

In Burkina Faso, based on their legal status, the following types of radio stations are seen:

- state public radio stations,
- private commercial radio stations,
- community radio stations,
- religious radio stations.

Apart from their status, as it relates solely to frequency, we can distinguish between FM radio stations which are the most numerous across the country, and those that use AM and MW frequencies, such as national and rural radio and national radio subsidiaries; *Radio Bobo, Gassan, Diapaga, Gaoua,* etc.

3. Serge Théophile Balima & Marie Soleil Frère, *Médias et communications sociales au Burkina Faso, Approche socio-économique de la circulation de l'information, pg 76,* Harmattan 2003, Paris – France.
4. Idem
5. Idem

In total there are:

- 11 public radio stations in Burkina Faso: one (1) national, two (2) regional, six (6) local and two (2) community-based;
- 19 private commercial radio stations;
- 19 religious radio stations;
- 23 non-profit making and community radio stations;
- 4 international private radio stations

In all, a total of 76 radio stations for a population of about 12 million inhabitants, or roughly one radio station per 160 000 inhabitants.

3.2 - An overview of the radio landscape in Benin

The first programmes broadcasting began on 7 March 1953 in a small branch of the Post & Telecommunications Office in Cotonou (Akpakpa). Benin having adopted Marxist-Leninist ideology in 1974, public radio had adopted the name of *Voix de la Révolution* to back up the regime. In its desire to ensure radio coverage of its national territory, the State then created a regional radio station in Parakou which began broadcasting on 23 March 1983.

The political crisis which occurred in Benin had led to the organisation of the National Conference in February 1990, which eventually had repercussions on the media. The day following this conference, *Voix de la Révolution* took a new name; *Radio Cotonou*.

In 1994, thanks to support from the former Cultural & Technical Co-operation Agency, certain rural areas benefited from the establishment of local rural radio stations. In 1995, the Swiss Cooperation set up community radio stations. They all come under the control of the national radio and operate according to public administration regulations.

The explosion of private radio is the consequence of the adoption of the new constitution in December 1991. The new constitution stipulates in Article 24: “Freedom of the press is recognised and guaranteed by the State. It is protected by HAAC (Audiovisual and Communication Authority) in the conditions fixed by an organic law.”

The aforementioned law (92-021) was passed on 21 August 1992. It established the Audiovisual and Communication Authority, in charge of the regulation of the press and communication, as well as attributing frequency bands to television channels and radio stations.

In 1997, the first radio stations obtained broadcasting frequencies for their programmes and since then, calls to tender launched by HAAC have allowed operating licences to be given to more than 50 radio stations in all categories (commercial and non-commercial). In addition, three (3) international radio stations that broadcast in Benin should be added:
1 - Radio Africa N° 1;
2 - British Broadcasting Corporation (BBC);
3 - Radio France Internationale (RFI).

These three radio stations transmit their programmes in FM from Porto-Novo (Africa N°1), and Abomey Calavi (BBC and RFI).

All in all, there are 66 radio stations spread through the country which proceed as follows:

- 18 commercial radio stations,
- 32 non-profit making or community radio stations,
- 4 religious radio stations,
- 3 international radio stations,
- 9 public radio stations including 5 public community stations.

3.3 - An overview of the radio landscape in Senegal

"Radio in the modern sense of the term first appeared in Senegal in 1939, on the eve of the Second World War, with the creation of Radio Dakar who, whilst providing special military listening equipment, broadcasted the first information bulletins."[6]

It was from 1962 onwards, with the establishment of collective listening posts in the seven (7) regions of the country that Senegalese national radio could be spoken of as such, thanks to the introduction of local production.

From 1962 to 1972, the State's monopoly on the media intensified and came up against competition from foreign radio stations: Radio Gambia, Radio Guinea and Radio Mauritania. From 1973 to 1984, listeners showed that they wanted more balanced representation of diverse political views and ethno-regional specificities in the country in the State media, signaling effectively the importance of radio as the most popular way of getting information in the Senegalese media landscape.

6. Saidou DIA - Radiodiffusion et NTIC : usage, enjeux et perspectives - May 2002

Today, the radio sector in Senegal is made up of a myriad of operators whose originality can be characterised by its diversity in the judicial sense, the types of organisations and their functioning, the nature of missions undertaken and the economic, technical and human resources they have.

Radio Télévision Sénégalaise (RTS) has three (3) radio stations at Dakar and eleven (11) regional stations. It has a powerful broadcasting range across the territory and benefits from an international presence thanks to satellite.

RTS's large production capacity, recently installed digital equipment and sizeable logistical resources allow it to cover almost all of the country. Benefiting from State support as a parapublic body, RTS, the oldest radio station, has accumulated real and considerable expertise and experience.

Foreign radio stations first appeared in 1989 on the FM frequency band with two (2) stations: *RFI* and *Africa N° 1*. Their establishment has contributed to satisfying the Senegalese need for varied information.

Today, OSIWA's West African radio station *WADR* and *BBC Africa* have also joined the ranks of the first foreign radio stations. These transnational radio stations are only accessible in urban areas, in particular in Dakar and in certain regional capitals for RFI. Moreover, they only broadcast in French and English, which limits their penetration rate.

The year 1994 marked media pluralism with the inauguration of *Sud FM*, the first private commercial radio station in Senegal which was to extend its coverage to the north, the centre, the south and south-east of the country. This was followed by *Dunya FM*, *Nostalgie* and *Walfadjri*. These radio stations attached to press groups were not long in achieving success thanks to their programming which combined music, news and interactive programmes. The station's concern for people can be seen in the treatment of news, which is prompt, more balanced and up-to-date. The public, especially in the capital, is discovering the virtues of freedom of expression and innovative treatment of current affairs.

Today, the situation of community radio stations (currently 38, without any real status) is still rather precarious in contrast to commercial radio stations. Indeed, the backing of major partners and financial support is sometimes insufficient to cover their various expenses.

These radio stations encourage real local communication thanks to preferential use of national languages but also and especially thanks to ICTs (in particular the telephone, Internet, digital, etc.). They promote local languages and allow a diversity of actors with or without a common interest to be reached (farmers, shepherds, nomads, popularizers, community organisations, NGOs, schools, public powers, rural or urban businesses, etc.). They are nearly all found in villages or rural communities, except for Dakar, the capital, which has five (5) stations, whilst four (4) others are located in the peri-suburbs, in Pikine and Rufisque.

In the beginning, community radio stations only had analogue equipment when they first started broadcasting. It was only from 2000 onwards that community radio stations started to equip themselves with computers. Today, new stations that are setting up are equipped with computers.

Until now, two hundred and fifty nine (259) band frequencies have been attributed by ARTP[7] in Senegal. However, the 259 band frequencies attributed have not all been used, and only 113 broadcast regularly; a breakdown of which is shown below:

- 21 public radio stations (including 6 relay stations which do not make programmes),
- 48 private radio stations,
- 38 community radio stations,
- 4 international radio stations,
- 2 religious radio stations.

Even if religious radio stations do not exist in radio broadcasters' terms of reference, certain radio stations have opted for a religious editorial line.

Concerning technological evolution, the appearance of both private, commercial and community radio stations has marked a deep rupture in general radio practices and in the system of national information. The first private and community radio stations were usually equipped with Italian transmitters, whose power varied between 250 watts and 2 kilowatts. Cable-stayed masts were most commonly found. From a single studio used for both production and transmission in the beginning, radio stations gradually equipped themselves better in order to improve transmission and listening quality on the FM band. With the benefit of professio-nalism, radio stations have taken an important qualitative leap in a dozen years.

7. Telecommunications and Post Office Regulation Agency

Technological evolution has come about through the use of ICT by private commercial radio. This is particularly the case for the telephone and DAT digital programming (Digital Automatic Tracking).

Technological evolution has been slower in the public sector. Analogue since its creation in 1939, *Radio Dakar* has had very limited influence with a 50 Watt transmitter, 8-track consoles, 24mm-band tape players and record-players. The station served a European population and the local elite in an urban area. With the competition from private stations, the national station has updated its basic equipment and increased its transmitter strength to 5 kilowatts with relay transmitters for national coverage. Digital technology made a timid entrance in the public network in 2000, with the acquisition of digital editing benches and broadcasting computers.

3.4 - An overview of the radio landscape in Niger

The first radio station - *Radio Niger* - was created on 18 October 1958, during the colonial period, two (2) months before the proclamation of the Republic of Niger.[8] It became the *Voix du Sahel* in 1974, following a military coup.

For more than three decades, Radio Niger dominated the radio landscape until the 1990s with the wave of democratisation, which would put an end to the media state monopoly.

In 1993, the liberalisation of the air waves arrived in Niger, in the midst of democratization. Indeed, the first private radio station - *R&M* - began to broadcast on 2 April 1994, followed by the FM revolution from 2000 onwards, which saw the birth of several commercial and community radio stations

Today, the radio landscape in Niger has a public radio system which has seven (7) regional, 20 commercial and 102 community stations. The majority of private radio stations are based in Niamey (13 out of 20). In contrast, 95% of community radio stations broadcast in rural areas.

Since the creation of *Radio Niger* in 1958, the evolution of equipment and technology has taken place in several phases:

- In 1960, the station was equipped with SAF consoles (8 channels), two (2) tape recorders and two (2) record players;

8. The Republic of Niger was proclaimed on 18 December 1958

- From 1962 to 1966, transmission was strengthened by the acquisition of a 30KW short wave transmitter. At the same time, certain regions were equipped with medium wave retransmitting facilities;
- A certain number of actions were taken between 1967 and 1974. The year 1967 in fact marked a decisive turn in radio broadcasting, with the creation of Niger Radio and Television Service (ORTN).[9] In order for the process to be carried out successfully, the Chairman of the Board of Directors of the new service was none other than Boubou Hama, President of the National Assembly and *éminence grise* of the PPN-RDA regime. During this period, MW retransmitters were installed in Tillabery, Téra, Gaya, Tahoua, Gouré, N'Guigmi, Diffa and Maîné Soroa to cover shadow areas. A part of the current medium - and short-wave transmission centre in Goudel was constructed. Short-wave coverage was strengthened by the installation of a 20 KW Thomson transmitter. In 1972, as part of the Niger-German cooperation, an UNIMOG car for reporting, equipped with 50-75 W SW transmitters was obtained;"[10]
- From 1975 to 1980, thanks to the discovery of uranium, production management and production studios began to be installed in the regions with Schlumberger equipment;
- Between 1980 and 1987, new Neuman and Telefunken equipment was bought and transmitter centres were enlarged;
- Between 1988 and 1994, a revitalization of the means of production was seen, with colossal investment by the new management of regional stations. New Telefunken FM transmitters were installed in eleven (11) areas.

Concerning the private sector, based on prevailing provisions in Niger,[11] the promoter of a commercial or community radio station should submit a complete list of all equipment with its request for authorisation addressed to the CSC (Conseil Supérieur de la Communication). The inquiries undertaken led to the discovery that commercial radio stations use various types of equipment but the most commonly used are ITELCO and B. BEAM. The transmitters generally have a capacity which varies between 250 watts and 2 kilowatts,[12] and cable-stayed masts are most commonly used. All the commercial radio stations have just one studio, which is used both for transmission and production, and they transmit in FM (frequency modulation).

9. Law N° 67-011 11 February 1967.
10. Source: National Programme of Communication for Development Document, page 66.
11. Deliberation N° 02-2007/P/CSC quoted (Article 29).
12. The radio station with the most powerful transmitter is BONFEREY, with 2 KW.

Technological evolution in the field of community radio has been strongly marked by the technological choice of the pioneering radio station; the Keita Project, which was equipped with a 150 KW transmitter and a production studio. To extend its broadcasting range, 30 W relay stations powered by solar energy were placed on the surrounding trays. It is a standard, approved set up of equipment (short and medium wave frequency modulation).

From 1994 onwards, the company WorldSpace, who broadcasts directly by low-orbit satellite, led a large offensive in Africa. In order to give themselves the most chance of success, WorldSpace promoters directly addressed funders, selling the technology as the most suitable in the fight against poverty. Bankilaré Community Radio was the pilot site for this technology in Niger. Equipment is Wantok-type: a modular suitcase, easily transported, containing a console, two cassette players, two CD, three microphones and a transmitter. Transmitter power varies between 30 and 100 watts, with coverage of up to 15 - 50 km in all directions. The transmitter is powered by four 50 W solar energy panels and four 100 Amp batteries.

UNDP had adopted this technology very early on, which was used to equip all the radio stations that it had helped install. Most of the technical and financial partners (SNV, AFRICARE, HKI etc.) also opted for this technology.

In 2006, UNDP ordered a study to be carried out on community radios.[13] They drew conclusions from this evaluation that it was desirable to change technology in the future; but above all, not to systematically define the equipment in advance: radio should, in essence be adapted to its location. The study also recommended that a technical study should be carried out in advance before installing any radio station while taking into account the energy variables.

3.5 - An overview of the radio landscape in Mali

Radio-Soudan, the first radio station in Mali was inaugurated in 1957 by Modibo Keïta, the then Mayor of Bamako and future President of the Republic of Mali. At the moment of independence, in 1960, Radio-Soudan became *Radio Mali*. The evolution of State radio was marked by institutional changes; in particular, the military coup in 1968 led by Lieutenant Moussa Traoré, which brought an end to President Modibo Keïta's socialist experiment. This coup was an important

13. Study of: "Réhabilitation des radios communautaires au Niger" (Rehabilitation of community radio in Niger) UNDP, 2006

stage in Mali's history which from then on was directed by the *National Liberation Military Committee* and later, by the *Democratic Union of the Malian People*, the only permitted party.

In 1991, the coup d'état, led by Lieutenant-Colonel Amadou Toumani Touré, put the finishing touches to a popular insurrection and established a *Transition Committee for the People's Salvation*. It was within this context that private radio began. *Radio Mali*, still a state-controlled radio, then began its transformation into a public service radio.

Today, the audiovisual landscape in Mali has the most concentrated number of radio stations in Africa. From 1991, when liberalisation of the radio waves began, until now, a dazzling evolution has taken place. The number of private radio stations increased from three (3) operational stations in 1992 (*Radio Rurale de Kayes*, *Radio Bamakan* and *Radio Liberté*) to one hundred and fifty (150) in 2006. In 2007, nearly four hundred (400) radio stations received authorisation to broadcast, but only two hundred and fifty (250) are actually on air. Around two thousand (2000) band frequencies are planned in the next few years, at the rate of three authorisations per village. Mali has seven hundred and three (703) villages involved in the project "A village, a radio station, a school."

As a result, the Malian radio landscape is one of the most dynamic in Africa. Radio stations cover all its territory. They are usually put in place within the framework of networks managed by associations or private promoters and exist as local stations, broadcasting mainly in local languages.

Some examples:

- the ***JAMANA network*** with ten (10) non-profit making radio stations running as operational co-operatives in Ségou, Koutiala, Nioro, Mopti, Koulikoro, Djenné, Timbuktu, Diéma, Naréna, Benkan and two (2) others currently being set up in Gao and Kidal;
- the ***KAYIRA network*** which today has seven (7) radio stations spread across Mali (Bamako, Ségou, Koutiala, Kita, Mahina, Niono, Kolondièba);
- the ***FINZAN-COM network*** which has seven (7) radio stations organised with management committees (Bamako, Kita, Ségou, Niono, Mopti, Gao, Timbuktu);
- ***ACCT rural radio stations***, are four (4), installed in Folona at Kadiolo, Cesiri at Niono, Baguinè at Bandiagara and Tizdas at Kidal. They are managed by local management committees and coordinated by ORTM;

- ***The four "MALI-SUD"*** community radio stations broadcast from Bendougou in Bla, Uyésu in Koutiala, Benso in Kolondièba, Kafokan in Bougouni. They function rather like ACCT radio stations, the difference being that their coordination is hosted at the Malian Textiles Development Company in Bamako;
- **the network created by the Protestant Church**, made up of six (6) radio stations, most of which are managed by Church representatives at a local level;
- **individual promoters network:** certain individual promoters are slowly building up a network of commercial private stations throughout the country. They are promoters - entrepreneurs or business men who, after some experience of creating commercial private radio stations, are now getting involved in other ventures of setting up radio stations. This is the case of the *Adaar Network created by Moulaye Touhami Haidara* and the *Almamy Samory Toure Network* (or TDM), the most important.

3.6 - An overview of the radio landscape in Sierra Leone

There was a proliferation of radio stations in Sierra Leone from the establishment of the IMC (Independent Media Commission), by a law passed by Parliament in 2000, for the granting of licences and the regulation of radio stations and television channels (IMC Annual Report, 2006).

Until 2000, radio broadcasts were limited to state radio stations. The SLBS (the Sierra Leone Broadcasting Service), who started broadcasting on short-waves in 1950, spread to the provinces in 1998, with community radio stations at Kenema, Bo, Kailahun, Kono and Makeni. All these stations broadcast on FM, and the SLBS also broadcasts daily on FM in Freetown, and assure coverage in the west of the country, as well as some areas in the districts of Port Loko and Kambia.

The first commercial radio station, *Radio ABC* was created in Freetown in 1990 and functioned briefly before closing its doors when the military régime was established in 1991. The first religious radio station in Freetown, *BBN*, was created in1993, followed in 1996 by the first community radio station in Freetown, *Voice of the Handicapped*. Two (2) commercial radio stations (*Kiss FM* in the Bo district and *Radio SKYY* in Freetown, in the west of the country) joined the radio landscape in 1994 and 1996 respectively, followed shortly after by a proliferation of commercial radio stations in Freetown.

Currently, there are nine (9) commercial radio stations in the country, nine (9) religious, twenty four (24) community, seven (7) government, six (6) broadcasting (relay) international-style stations and six (6) radio stations managed by the UN. Many requests for licences are pending.

Radio United Nations joined the radio landscape in the 1990s, and established relay stations in Bo, Kenema, Kono, Kailahun and Makeni. This landscape is marked by a significant presence of international radio broadcasters with RFI (*Radio France Internationale*), BBC (*British Broadcasting Corporation)*, WADR *(West Africa Democracy Radio*) and VOA *(The Voice of America*). These radio stations use satellite receivers to capture signals that they then re-transmit. VOA, RFI and WADR only re-transmit from Freetown, while the BBC re-transmits from Freetown, Bo and Kenema. In addition, the BBC installed some satellite receivers in the most remote regions such as Kailahun, Kabala and Makeni, to re-transmit local community radio stations' air waves with greater ease.

SLBS (Sierra Leone Broadcasting Service) is the government radio station. It broadcasts in Freetown, Bo, Kenema, Kailahun, Kono and Makeni. The government also uses a station which broadcasts school programmes in Freetown. It is planning a transformation of these radio stations which will be joined together in a public radio broadcasting organisation which will no longer belong to the government but the people.

Among the nine (9) religious radio stations in Sierra Leone, five (5) are based in Freetown and four (4) in the rural provinces. *Believers Broadcasting*, a religious station based in Freetown, came onto the media landscape at the end of the 1990s. Recently, *Radio Maria* entered the scene with a central radio station in Makeni and relay stations in Freetown and Bo.

The development of community radio stations has been the most rapid of the nine (9) stations in the west of the country, including fifteen (15) in the provinces. All the rural community radio stations studied do not have Internet (although some have e-mail and consult the Internet in internet cafés), and none of them have a website. All the provincial radio stations joined the media landscape after 2000, except *Kiss 104 FM* that started broadcasting in 1994.

The proliferation of radio stations began in the period after the Second World War, with a very strong demand particularly from international organisations such as the WFP (World Food Programme), Red Cross, MSF (Médecins San Frontières), RRR (National Reconciliation, Rehabilitation and Reintegration Programme), DFID,

Westminster Foundation for Democracy. These organisations needed radio stations for support of their rehabilitation programmes in the country. During this period after the war, radio became a very important communication tool for the social, economic and political sectors.

Technologically, radio stations in Sierra Leone passed gradually from analogue to digital, albeit slowly. From recording equipment via editing to transmission equipment, the latest model in digital modern equipment has been invested in radio stations in Sierra Leone.

SLBS, the oldest radio entity, was on short wave (AM and MW) until 1993, when it started broadcasting for the first time on the FM frequency band. All the stations were analogue until 1998, the year when the UN radio station joined the media landscape with digital programming.

Many radio listeners have gradually replaced their AM radios with FM radios, since all radio stations currently broadcast on FM.

3.7 - An overview of the radio landscape in Ghana

The beginning of radio broadcasting in Ghana dates back to 1935, with a department under supervision of the Ministry of Information. In the beginning, it was a radio station allowing mainly BBC World Service programmes to be relayed, in accordance with the mandate of the Minister who was responsible for disseminating information concerning economic and social development. Today radio sets are easily affordable but this was not the case when radio was first established in Ghana. The number of radio sets were very limited, extremely expensive and rare. Only a small percentage of the community, particularly rich expatriates, were able to afford the radio sets.

In 1936, an expansion of the radio service was witnessed with a relay station opening on Cape Coast, the regional capital of the centre. Three (3) more stations were opened in 1937.

A new broadcasting structure was constructed in Accra during the Second World War in 1940, with a small 1.3KW transmitter. It was during the 1940s that broadcasts in local languages began in four (4) of the major Ghanaian languages - Twi, Fanti, Ga and Ewe. A significant event in broadcasting history was the creation of the Gold Coast Broadcasting System in the Gold Coast (as Ghana was then known) in 1954. At the time, the content of programmes was limited to government announcements and the retransmission of BBC programmes.

Later, programme content improved locally and there were more and more live programmes as well as teaching programmes.

When the country achieved independence in 1957, and the Gold Coast became Ghana, the Gold Coast Broadcasting Service became the GBS (Ghana Broadcasting Service). In 1958, Ghana began broadcasting internationally with the inauguration of the GBS External Service.

Today, the broadcasting media has seen exponential growth supported by strong market demand, commercialisation, privatisation and availability of cheap technology, such as FM transmitters, all in an environment of favourable regulation. There are more than three (3) million radio sets in Ghana.

The first FM community radio station began in 1987. In 1995, 36 private companies were granted authorisation to commercialise TV and radio networks. In 1996, ten (10) new community radio stations were authorised. According to the NCA (National Communication Authority), of the 137 radio stations authorised in Ghana, 129 out of the 137 are operational.

As for satellite radio stations, the GBC (Ghana Broadcasting Corporation) was a pioneer in 1997 when it negotiated an agreement with WorldSpace for them to supply the GBC a channel on its Afristar satellite. This allowed the GBC to broadcast 24/24 live and in DDB (Direct Digital Broadcasting), over a large coverage area, reaching millions of radio listeners.

Recently, some international radio stations such as the BBC, CFI, Deutsche Welle, etc., have also signed agreements to retransmit programmes for the benefit of their listeners. In addition, certain radio stations such as *Joy FM*, that are part of the radio *Multimedia Group*, use satellite to transmit programmes throughout the country through their subsidiaries.

From the point of view of geographical distribution, most radio stations are found in urban areas, and only some in rural areas. *Give And Take There* is a radio station covering all Ghanaian territory.

ICT Environment in West African countries

4

4.1 - Short history of the Internet

The internet was first launched in **Senegal** in the year 1989, with the installation of a computerized network by IRD (ORSTOM) to improve communication between Paris Headquarters and its overseas centres. The first network of "Store & Forward" type e-mail, based on the Unix operating system and UUCP protocol was then installed in Dakar at the CRODT (Dakar-Thiaroye Oceanographic Research Centre).

A permanent connection in **Senegal** was finally established in March 1996 with a 64 kbps bandwidth. During the months which followed the establishment of the Internet in the country, dial-up internet providers multiplied. There were seven (7) by the end of 1996, with more than a dozen websites already on-line. All the existing networks (RIO, ENDA, REFER) joined together to become the Senegalese Internet.[14] From that moment, the Cheikh Anta Diop University controlled the entire ".sn" national domain. In May 1997, Senegal tripled its bandwidth with the establishment of two new 64 kbps lines to Canada (TeleGlobe operator). These two lines merged into one 1 Mbps line in November of the same year. This international connectivity continued to improve and reached 36 Mbps in 2000.

The Internet was also launched in **Ghana** at the start of the 1990s (1989/90), with a project piloted by PADIS (Pan African Development Information System), and the international Fidonet network of the IDRC (International Development & Research Centre) to link GHASTINET (Ghanaian Scientific and Technological Information Network), the AAU (Association of African Universities) and the TCC (Technology Transfer Centre) at GreenNet in London via the telephone.

The service was limited to e-mail which was sent 3 times per week, because of its 2400 Bps. Later, the AAU began to use UUCP (Unix-to-Unix Copy Protocol), while health services moved to HealthNet. The HealthNet system was based on satellite technology at the time. Permanent access to the Internet became available in January 1995 with the commercialization of results from the work done by NCS's network (Network Computer Systems). The majority of both private and public organisations, however, were connected to the Internet from 1997 onwards.

14. C. Brun - http://www.orstom.sn/intersen/histo.shtml

Benin, taking advantage of the organisation of the Sixth Francophonie Summit in Cotonou in 1995, was able to access information highways by REFER (the Francophone Network for Education and Research). Starting with 64 Kbps, several steps were taken over the years for the democratisation of access to the Internet. Thus, bandwidth increased from 128 Kbps in 1998, to 2 Mbps in 2000 and 47 Mbps in 2003 thanks to the installation of SAT3. At the same time, authorization was given to private internet service providers (ISP) who were able to give a new lease of life to the ICT sector in Benin.

Niger officially established an internet connection on 13 November 1996 by SONITEL, the first operator. The access was obtained thanks to an international link of 64 kbtps was entirely digitalised and the service was officially inaugurated in Niamey in May 1997. International bandwidth was increased a year later to 192 kbps (Kilobits per second), with a 128 kbps connection to the WEB said to be "premium quality". Finally, in 2001, bandwidth increased to 2 Megabits per second.

In **Burkina Faso**, the Internet became normalized at the end of the 1990s. However, it was from 19 March 1997[15] that ONATEL established Internet access which for a long time, remained a tool of the urban elite in Burkina Faso as in the majority of African countries. Its real popularisation would begin at the start of 2000 with the proliferation of internet cafés in the larger as well as smaller towns in the country.

Nowadays, the Internet is used in Burkina Faso by all members of society in the country: administrative staff, business operators, those working in the private sector, journalists (press, television and radio etc.), pupils and students …

Mali was connected to the Internet on 31 December 1996, thanks to the installation of a national Internet network costing 300 million francs CFA, 50% of which was financed by the telecommunications operator at the time, SOTELMA (Mali Telecommunications Company) and USAID (US Agency for International Development), through the Leland1 Initiative. This network started on 26 June 1997 and its official launch took place on 20 September 1997. From 1992 to1997, RIO (Intertropical Computers Network) of ORSTOM (French Institute of Scientific Research for Development in Cooperation) allowed research institutions and NGOs to send e-mail and files by UUCP X25 via Montpellier in France (See *www.msha.fr/msha/publi/en_ligne/netafriq/publi/missionMALI.pdf*).[16]

15. Emmanuel Guigma L'Internet au Burkina Faso, **http://www.itu.int/africainternet2000/countryreports/bfa_f.htm**
16. *Report by Théophile Vittin* - Maison des Sciences de l'Homme d'Aquitaine - 2002

In **Sierra Leone**, the Internet made a late entrance onto the media landscape in 1997, when service providers came out with data services. These new services were however, only available in the Freetown area. A permanent connection to the Internet in Sierra Leone was made possible by the American operator Globe One and the national telecommunication operator Sierratel. The latter was also the administrator of ".sl" the TLD (Top Level Domain). In the beginning, Sierratel had chosen two private internet service providers for private customers. Holron SL and Securicum were the first for Sierra Leone in 1997.

Box 1:
Definition of technological concepts

What is ADSL?

The Asymmetric Digital Subscriber Line is a technology which allows broadband to pass via a telephone line. The ADSL uses frequencies left free by traditional telephone service. The connection is permanent and billed at a fixed rate. In contrast PSTN "Public Switched Telephone Network" which is the standard telephone network is billed according to use.

What is WiFi?

Wireless Fidelity is a wireless communication technology which allows the establishment of local networks. The principal is to establish fast radio links between access points and terminals linked to broadband networks. WiFi or 802.11b standard in theory reaches a speed of 11 Mbtps or 54 Mbtps for the 802.11a/g standard.

What is Wimax?

Worldwide Interoperability for Microwave Access is a broadband wireless transmission standard. Wimax or 802.16 operates at 70 Mbtps. It allows for example, relaying a shared broadband connection to multiple users. With a theoretical range of 50 km, it should allow future development of metropolitan networks (MAN) based on a unique point of access, in contrast to an architecture based on several WiFi points of access.

What is VSAT?

Very Small Aperture Terminal is a terrestial station with a small antenna, designed to communicate with analogue stations by satellite, controlled by a station. Very pratical to link by satellite sites spread out over a large area.

4.2 - Evolution of the Internet

The majority of countries in West Africa started off with a slow-speed connection at the rate of 64 kbps which has improved over the years. Connecting the rest of the country to the internet has come up against the problem of the fixed telephone network, which on the one hand does not cover all the country and on the other, sometimes offers a poor quality of service.

Today, fibre optics is seen as offering the possibility of a fast speed connection internationally and for the interior of the country, along with satellite possibilities, which despite their high cost remain simpler to establish and use. The options for connection have increased and as well as standard access using a fixed telephone line, a whole panoply of services has developed, such as ADSL and wireless technology (Wifi, Wimax, etc.).

Internet bandwidth in the targeted countries in 2008

Country	Bandwidth
Burkina Faso	352 Mbps upstream and 370 Mbps downstream
Niger	31 Mbps
Senegal	1.7 Gbps
Benin	155 Mbps
Mali	189 Mbps
Ghana	1.8 Gbps
Sierra Leone	30 Mbps

The increase in bandwidth accompanied by a drop in access costs has happened almost everywhere in Africa. This has stimulated more demand by radio stations to be connected, for whom the major advantage of the internet remains the exchange of audio programmes, as well as better facilities for researching information, and interaction with listeners.

Between one country and another, the rate of Internet penetration shows wide disparities. Indeed, according to the international statistics website on population and the internet market, *Internet World Stats,*[17] the penetration rate in 2008 varies between 0.20% for Sierra Leone and 6.4% for Senegal.

17. http://www.internetworldstats.com/stats1.htm#africa

Table of internet penetration rate in countries taking part in the study

	Estimated population (2008)	Internet users	Penetration (%Pop)
Senegal	12 853 259	820 000	**6.40**
Mali	12 324 029	100 000	0.80
Benin	8 294 941	150 000	1.80
Ghana	23 382 848	650 000	2.80
Sierra Leone	6 294 774	13 000	**0.20**
Burkina Faso	15 264 735	80 000	0.50
Niger	13 272 679	40 000	0.30

Beyond this disparity of penetration rate between countries, the internet propagates the imbalance between the well-connected regional capitals and rural areas which do not have adequate basic infrastructure.

The explosion of the Internet in Africa took place at the beginning of 2000 with the proliferation of internet cafés in both major and medium-sized towns. In a very short time the Internet became an essential tool in terms of research and documentation for students and researchers, and for those working in business & administration, journalists, etc.

In Burkina Faso, with the opening of the Internet to the wider public in 1997, by December of that year, there were around 900 machines connected to the Internet with a total population of 2000 internet users. This figure rose to around 4000 internet users during 2000.[18]

The connection speed has risen relatively in Burkina Faso, starting at 64 Kbps. Burkina's internet network "FASONET" saw its capacity rise to 256 Kbps in January 1998, to reach 1 Mbps from 15 November 1999 onwards. This speed increased remarkably between 2006-2008, from 197 to 352 Mbps upstream and from 215 to 370 Mbps downstream.

18. Emmanuel Guigma, l'Internet au Burkina Faso, **http://www.itu.int/africainternet2000/countryreports/bfa_f.htm**

Table of the main internet services providers and costs in Burkina

Operators	Example of services	Monthly costs
CENATRIN	Unlimited connection	35 000 FCFA
RIVER TELECOM	Monthly connection	10 000 FCFA
ONATEL	ADSL Broadband internet	ADSL 512 Kbps: 59 900 FCFA
GIGANET	Internet Access, satellite, LMW	512 Kbps: 195 000 FCFA
IPSystem TELECOM	Broadband internet (WDSL), IP Telephony	WDSL: 512 Kbps: 69 900 FCFA

In Niger, the map of Internet coverage reveals the very wide disparity between the capital, Niamey and other regions of the country. With the exception of MIGAS, all the ISPs are based in the capital. In terms of coverage in the interior of the country, only Sahelcom provides residential Internet access, by PSTN through a fixed line; and MIGAS was only available in the commune of Arlit. For businesses and internet cafés, there was a range of choice between several ISPs in Niamey, with a variety of technology (LMW 5.8 GHz, LMR WIMAX 3.5 GHz, LS, WIFI 2.4 GHz & VSAT). In the interior of the country, this range of choice is not available to businesses and internet cafés: outside Arlit, there was only CDMA 800 MHz deployed by SONITEL. In total, the ISPs supply sixty (60) internet cafés, with the overwhelming majority based in Niamey. Overall speed of access to the Internet provided by the national operator, SONITEL, was 31 Mbps in 2008. This slow-speed connection is explained by the absence of Niger in the first phase of the SAT-3 optic fibre project. In July 2008, SONITEL, through the operator Bénin Telecoms, on Niger's behalf, signed an optic fibre networks interconnection contract with Benin which will allow Niger to connect to SAT-3 and to have 155 Mbps bandwidth in the near future.

Table of main Internet service providers and costs in Niger

Operators	Example of services	Monthly costs
AFREETEL	Broadband internet, construction of masts and configuration	512 kbps: 110.000 FCFA/month
ALINK NIGER	Provides Internet access by LMW, Wimax and VSAT	128 kbps: 289 000 FCFA/month 512 kbps : 650.000
CONNECTEO	Internet by Wimax, VSAT and BLR	512 kbps: 700 000 FCFA/month
IXCOM	Internet and IP telephony by LMW, Wimax & VSAT	512 kbps: 500 000 FCFA/month
SAHELCOM	Internet by PSTN, DL and LMW	512 kbps: 550 000 FCFA/month
SONITEL	Internet Access by WIFI, DL and CDMA	512 kbps: 110 000 FCFA/month

Concerning **Senegal**, the operator SONATEL launched its IP infrastructure network in 1999, which has allowed for increased growth in the number of users. The Senegalese backbone, based on ATM OC3 links (155 Mbps), E3 (34 Mbps) and E1 (2 Mbps), links all the smaller towns of the country. Tariffs have fallen considerably for all services, from dedicated lines through to national and international communication costs.

The international connectivity of the country reached 1.7 Gbps in 2008. ADSL technology covers all the country today, and offers broadband connection. However, a certain number of communes and rural communities still only have a PSTN connection (a fixed line), which restricts the amount of subscribers in these areas because of the high cost of this type of connection. In fact, according to the ARTP Observatory, the number of ADSL subscribers is 39,113, representing more than 97% of the market, whilst PSTN subscribers represent 2.51% of the market.

A sample of the main Internet Service Providers and their costs in Senegal

Operators	Example of services	Monthly costs
AUF	Broadband internet	ADSL 512 kbps: 2 500 FCFA
ORANGE SENTOO	Broadband internet, IP Telephony, Hosting	ADSL 512 kbps: 6 400 FCFA
TRADE POINT	Broadband internet, Website hosting	ADSL 512 kbps: 8 000 FCFA
UCAD	Broadband internet	ADSL 512 kbps: 2 500 FCFA
ARC Informatique	Broadband internet, Website hosting	ADSL 512 kbps: 8 000 FCFA
ATI	Broadband internet	ADSL 512 kbps: 7 725 FCFA

In Benin, the development of the Internet has been spectacular, especially in large towns such as Cotonou. Nevertheless, it must be recognised that this sudden rush showed its limits very quickly, faced with insufficient and failing basic infrastructure of the Post Office and Telecommunications Service. In January 2008, the internet connection speed of Benin provided via SAT-3 by the operator at that time, Bénin Télécom (who usually provided international access) was 155 Mbits per second, according to the information obtained via the ICT discussion list in Benin (SI_Bénin).

Table of some Internet Service Providers and their costs in Benin

Operators	Example of services	Monthly costs
Pharaons Technologies	Broadband internet	ADSL 256 / 64: 75 000 FCFA (residential tariff)
Benin Telecom	Broadband internet excl. tax	ADSL 512 / 128: 80 000 FCFA
Isocel	Wireless Broadband	ADSL 512/128: 150 000 FCFA

Until 2004, overall broadband speed in **Mali** was still limited to 34 Mbps. This speed was obtained exclusively thanks to satellite links. Today, it has reached 189 Mbps thanks to Mali's connection to SAT-3 cable, thus offering a faster connection by fibre optics.

Regarding telecommunication services, a dozen Internet Service Providers (ISPs) and a dozen organisations and institutions are the main service providers in Mali. They mainly use VSAT antennae ranging from 512 Kbps to 1 or 2 Mbps for downstream and dedicated lines (DL) from SOTELMA for upstream. Users of VSAT antennae use all satellite segments rented to various satellite telecommunication services operators.

Table of some Internet Service Providers and their costs in Mali

Operators	Example of services	Monthly costs
Afribone	Broadband internet	Starting from100 000 FCFA
Orange Mali	Broadband internet	ADSL 512 kbps: 179 000 FCFA ADSL 256 kbps: 42 000 FCFA

In **Ghana**, use of the Internet saw an unprecedented take off, as many individuals and institutions rushed to get internet access. The increase in the number of internet cafés has been an important factor. Although internet cafés are found all over the country, the majority of them are situated in the capital, Accra.

With the number of Internet access centres (cafés, post offices, communication centres, telecentres, etc.) proliferating throughout the city, it is estimated that the city alone has more than 100 Internet access centres, with an occupancy rate of more than 90% in most of the centres. Growth has also been particularly strong in the private sector for which the internet has become a very important tool for business.

Internet Service Providers are extremely numerous in Ghana today, according to the NCA, the regulation authority. There are 165 Internet Service Providers of which 29 are operational and 179 VSAT operators including 57 operational. The number of businesses providing Internet services has been estimated at 86 in Ghana. The overall speed of internet access available from Ghana Telecom was 1.8 Gbps in 2008.

Table of some Internet Service Providers and their costs in Ghana

Operators	Example of services	Monthly costs
Internetghana	ADSL Broadband internet	ADSL 512/256: 280 GHC (118 720 FCFA)
Ghana Telecom	ADSL Broadband internet	ADSL 521/128: 185 GHC (78 440 FCFA)
NCS	Broadband internet Wimax	Wimax 512 / 1024: $304.75 (31 800 FCFA)

In **Sierra Leone**, the use of the Internet has somewhat developed, although there are some problems related to high costs, the slow-speed connection and power supply problems. Internet broadband service is now available in the provinces (outside Freetown). In 2002, the Internet was only available in UN peace camps situated in the provinces. These camps also supplied connectivity by satellite to the main UN relay-stations. In 2008, internet services became accessible to the public in Bo, Kenema, Makeni and Kailahun.

The rate of internet access in Sierra Leone remained low from its introduction in the country. It was from 2008, with the launch of wireless services that use increased considerably. Today there are eleven (11) ISPs in Sierra Leone.

The capital, Freetown, has widespread wireless internet connection, and access is offered in cafés, retail shops, hotels and internet cafés. However, problems such as intermittent power supply have affected the internet being used more.

Concerning radio stations, demand for internet connection continues to grow. Thanks to this technology, stations are trying to improve not just the level of interaction with the public, but also programme quality by researching information on the network.

Table of some Internet Service Providers and costs in Sierra Leone

Operators	Example of services	Monthly costs
IPTEL/PCS Holdings (SL)	Ltd Broadband internet, Wireless	128/60 kbps: $350 (148 400 FCFA)
Multinet (SL) Ltd	Broadband internet, Wireless	128/60 kbps: $350 (148 400 FCFA)
Limeline Sierra Leone	Broadband internet, Wireless	128/60 kbps: $400 (169 600 FCFA)

The cost of accessing broadband internet in an internet café in Freetown is five thousand Leones (Le 5,000), equivalent to $1.75 an hour. At Bo, the cost is six thousand Leones (Le 6,000), equivalent to $2.00 (about 800 FCFA).

4.3 - Internet access services and costs

The products offered by Internet Services Providers are almost the same in all the countries involved in this study. Generally connection is provided through:
- Public Switched Telephone Network or PSTN,
- Dedicated Lines,
- ADSL,
- Wireless (Wifi, Wimax, BLR,etc.).

In certain countries, there is also IP telephony and website hosting.

A sample overview of the cost of "broadband" Internet access in the countries taking part in the study

	Technology	Speed	Monthly costs
Burkina Faso (ONATEL)	ADSL 512 kbps	ADSL broadband Internet	59 9000 FCFA
Niger (AFREETEL)	ADSL	512 kbps	110 000 FCFA
Senegal	ADSL	256 - 512 kbps	2 500 - 8.000 CFA (+11 500 FCFA/month for Sonatel internet link)
Ghana (Broadband4U)	ADSL	512 kbps	185 GHC (about 78 440FCFA)
Sierra Leone	Wireless	128 kbps	$350-$400 (148 400 - 169 600 FCFA)
Benin (Bénin Télécom)	ADSL	512 kbps	94 000 FCFA
Mali (Orange Mali)	ADSL	256 kbps	36 000 FCFA

Senegal has the cheapest internet connection costs with very high speed connections and Niger has the highest costs.

4.4 - Fixed telephony: a penetration rate which remains low

Like many places in the world, fixed telephony revenues are decreasing as a result of the improved mobile telephony capacity. In the countries of the sub-region, the quality of the fixed network has for a long time hampered internet development and inter-active and vocal value-added services. More than 10 years after the arrival of the Internet, connectivity is still linked to the development of the fixed telephony network, in particular with ADSL technology.

Indeed, in Niger for example, the number of lines per 100 inhabitants was 0.16 in 1997. This rate was still very low in 2006 with 3.6 lines per 100 inhabitants. In Senegal, despite an entirely digital telecommunication infrastructure, the number of fixed telephone lines was estimated at 269,088 at the end of 2007, with a negative growth rate compared to previous periods (-3.25%), according to the ARTP Observatory. The penetration rate of fixed lines compared to the population of Senegal barely reached 2.54%, in the same period.

In Ghana, the number of fixed lines was estimated at 376, 509 at the end of 2007, which represents a relatively low penetration rate of about 1.64%.

In Mali, teledensity has also remained very weak with 3.94 lines per 100 inhabitants in urban areas and 0.07 lines per 100 inhabitants in rural areas.

The development of Internet access in all countries really began with the arrival of alternative technology, particularly wireless, such as Wifi, WiMAX, Last Mile Wireless and to no small extent, satellite.

4.5 - Mobile telephony: sustained exponential growth

Africa is the region in the world which has seen the strongest annual growth in the number of subscribers to mobile telephony.

In fact, according to Myriam Berber of RFI "*in Africa where fixed lines lag behind, mobile growth increase has been spectacular during the last five years. According to the GSMA (worldwide association of operators), Africa is the region in the world where the annual growth in the number of subscribers is the strongest, with about 70 million new subscribers in 2007. Of a population of around 960 million Africans, nearly 280 million now own a mobile telephone, which contrasts with 20 million subscribers to a wire line network. However, more than 300 million rural inhabitants have no network at all.*"[19]

19. Article published on 14/05/2008

Table of the main mobile service operators in different countries

Country	Mobile operators	Website address
Burkina (3)	TELMOB	http://www.onatel.bf/telmob/index.htm
	CELTEL	http://www.bf.zain.com/fr/
	TELECEL	http://www.telecelfaso.bf
Niger (4)	CELTEL NIGER	http://www.ne.zain.com/fr/
	ATLANTIQUE	
	TELECOM NIGER	http://www.telecelniger.com/
	SAHELCOM	http://www.sahelcom.ne/
	ORANGE NIGER	http://www.orange.ne/
Ghana (4)	MTN	http://www.mtn.com.gh/
	TIGO	http://www.tigo.com.gh/
	ONE TOUCH	http://www.onetouch.com.gh/
	CELTEL	
Sierra Leone (5)	CELTEL	http://www.sl.zain.com/en/
	MILICOM	http://www.tigo.sl/
	COMIUM	http://www.comium.com.sl/
	DATATEL	
	AFRICELL	http://www.comium.com.sl/
Senegal (2)	ORANGE	http://www.orange.sn/
	TIGO	http://www.tigo.sn/
Benin (5)	LIBERCOM	http://www.libercom.bj/
	TELECEL	http://www.moov.bj/
	BENINCEL	
	BELL BENIN COMMUNICATION	http://www.groupebellbenin.com/
	GLOBACOM	http://www.gloworld.com/
Mali (2)	MALITEL	http://www.malitel.com.ml/
	ORANGE MALI	http://www.orangemali.com/

In **Burkina Faso**, mobile telephony first appeared at the end of the 1990s, particularly during 1998. In the beginning, only ONATEL provided a mobile telephony service through its TELMOB service (Téléphonie Mobile du Burkina). This quasi-monopoly of ONATEL on mobile telephony in Burkina Faso was then lifted and since this date the mobile telephony sector has been shared between TELMOB, CELTEL and TELECEL.

The average cost of a SIM card is 3 000 FCFA. The 3 companies also offer promotional rates, either for calls or SMS, which vary depending on the company and the marketing period. The same applies for the cost of buying a SIM card when there are often promotional periods with very low prices accompanied by a bonus of prepaid credit.

In **Niger**, the first AMPS cellular centre was installed by the Niger telecommunications company, SONITEL in March 1998. It had 55 mixed channels (transmission and reception), with a capacity of three thousand (3,000) subscribers. Mobile telephony began in a context of strong demand for fixed lines, when supply was limited. This meant that after the first quarter of 1999, the number of subscribers increased by 75%.

In describing the national context of telecommunications on the website of ARM (Multisector Regulation Authority) it is stated that "*existing demand in Niamey and in rural areas is strong but investment is insufficient, faced with the growth in demand for high quality telecommunications services. In addition, a technical audit of telecommunications in Niger has revealed the extreme deficiencies in the existing network, which for the most part, has analogue equipment, which makes their use more and more difficult when all their counterparts in Niger have digitalized their equipments."*

Today, the mobile telephony sector in Niger is marked by the presence of four (4) operators:

- CELTEL NIGER (launched their activities on 18 October 2001);
- ATLANTIQUE TELECOM NIGER[20] (began on 27 December 2003);
- SAHELCOM (began their activities in 2005);
- ORANGE NIGER (obtained a global licence at the end of 2007 but has still not begun operating).

Initially reserved for Niger's capital, Niamey, the mobile telephony network quickly spread to the provinces. Currently all eight (8) main regions, thirty-seven (37) *départements* and certain administrative centres, rural communes and large villages are covered by the GSM network. However, mobile telephony still remains essentially an urban phenomenon; and its expansion mainly a result of the imperatives of profitability. According to the strategy document on universal access to telecommunication services in rural and peri-urban areas, approved by the Nigerian government in July 2007, *"84% of rural communes (178 out of 213*

20. Since 6 March 2008, TELECEL Niger has taken this name.

communes) are still not covered by GSM." The same document states that "Niger today, remains the country with the lowest teledensity for fixed and mobile telephony networks within the WAEMU zone, the improvement in national teledensity having occurred almost exclusively thanks to the development of mobile networks, and this within a context of relatively expensive cost."

In **Ghana**, Mobitel (a service of Milicom Ghana Limited) now called Tigo, was the first mobile telephony operator at the beginning of the 1990s. Its brand name was so well-known that even now many people still call any kind of mobile phone 'Mobitel'. Then a second mobile provider called Celtel (now known as KASAPA) set up towards the end of the 1990. In November 1996, the first GSM service was launched by Scancan Ltd, using the brand name Spacefon. Later, they became Areeba and now are known as MTN. In 2000, Ghana Telecommunications introduced their GSM service called OneTouch.

The mobile telephony sector is benefiting from large growth. According to the National Communication Authority, there are currently more than 7, 604,053 mobile subscribers, in contrast to 376, 509 for fixed lines. The number of mobile subscribers is reasonable for a population of 23, 000 000 inhabitants, and it is forecasted for this number to grow in the months to come. The mobile telephony providers in Ghana are MTN, TIGO, ONE TOUCH, KASAPA and WESTEL (recently sold to CELTEL).

Apart from vocal calls, there are many value-added services supplied by mobile telephony companies in Ghana, which include SMS, MMS (Multimedia Messaging Service), SMS to e-mail, mobile internet, call-forwarding, WAP (Wireless Application Protocol), credit sharing, number identification, call waiting, voice mail, ring tones, call blocking, itemised billing and teleconferencing. It should be pointed out that it is currently impossible in Ghana to change from one mobile telephony operator to another without losing your personal phone number. However, a service to deal with this problem is planned in the near future.

Mobile telephony began in **Sierra Leone** in 2000, when Mobitel started operating, but radio stations only became interested in 2002, with the entrance in the market of five (5) mobile telephony companies which spread to different communities throughout the country. Celtel, Millicom, Comium, Datatel and Africell all started up between 2000 and 2003.

The most recent census done (2006) estimated Sierra Leone's population at 5.7 million inhabitants, but there is no recent data on mobile telephony or internet usage. Yet with five (5) mobile telephony companies and Internet access, which is

on the increase via the numerous internet cafés, it can be supposed that there has been an increase in the mobile telephony sector and internet access during the last few years.

The cost of SIM cards for all mobile telephones is five Leones (Le 5,000) equivalent to $1.50, and these cards can be bought from street sellers and shops throughout the country.

In **Senegal**, Sonatel began commercializing mobile telephony in 1996 and it was only in 1999 that the subsidiary Sonatel Mobile, with its Alizé brand, was formed. The second operator in Senegal, SENTEL (Tigo), with its Hello brand, began operating officially on 16 April 1999. Using digital GSM 900/1800 technology, SENTEL (Tigo) thus put mobile telephony within reach of everybody in Dakar as well as the interior of the country with exceptional listening and reception quality.

Since its creation, the number of subscribers continued to grow, going from 251,395 in 2000 to 782,423 in 2003. This rise confirms the trend recorded during the last few years. In fact, the average annual growth of subscribers is in the order of 100% since the introduction of the mobile in Senegal in 1996. The rate of progress made by Sentel (Tigo) can also be observed with a market share of 18% in 2002, 26% in 2003 and 32% at the end of November 2007.[21]

Twelve (12) years after its introduction in Senegal, mobile telephony continues to rise. Indeed, the ARTP Observatory shows that on 31 December 2007, the global mobile market, made up of 2 operators had more than 4 million subscribers (4,122 867) divided between Orange (3,004.363) and Tigo (1,118 504). The rate of mobile telephony growth was 20.06% and the relatively high penetration rate increased to 38.7%.

Mobile telephony began in **Benin** in 1998 with the development of a telecoms sector legal and regulatory framework for its liberalisation; especially with the opening up of competition of certain OPT activities (Post Office and Telecommunications Service). Liberalisation measures became effective from 1999 with the granting of GSM licences to private operators.

As well as Libercom, a GSM subsidiary of OPT, authorisation was granted to private GSM operators (Télécel, Bénincell, Bell Bénin Communication and recently Globacom).

21. ARTP: Telecommunications and Post Office Regulation Agency

Thanks to the determined political will of the Benin authorities, telecommunications operators were invited in July 2006 to lower communication service costs; particularly products and services offered by GSM mobile telephony operators who finally lowered costs by 20%. This measure resulted in interconnection between GSM operators, and previously high message costs (75 - 100 FCFA) were reduced to 50 FCFA per SMS between networks and sometimes less for a communication between clients in the same network.

The number of subscribers to mobile networks increased significantly with a fall of 20-30% in the cost of SIM cards and telephone equipment.

New services have been commercialised by GSM operators which include: access to the internet on the MOOV network (TELECEL), downloading of music and logos from operators' websites, networks' support to radio stations for interactive programmes, games and information services such as horoscopes or news on the African Nations Cup which took place in Accra in January and February 2008.

Box 2:
What is CDMA?

(Code Division Multiple Access) - Describes a wireless telephone process using a wide frequency spectrum. It is a 3rd generation mobile technology recognized by UIT. Today, the CDMA 2000 variant is the most used by operators who want to offer their subscribers broadband internet access in particular.

The quality of services offered by GSM operators remains mediocre. At the end of December 2006, the GSM operator Areeba Bénin, became MTN, with a total of 476 000 subscribers. Despite the absence of new figures, it is not difficult to assert that this figure has increased, taking into account the new resources and intense publicity of this operator throughout towns and the four (4) television channels operating in Benin.

In **Mali**, in 2008 the mobile telephony market was estimated at 4,176,000, according to the CRT (Telecommunication Regulation Committee). This exponential increase in the number of mobile telephones is impressive as everywhere in Africa. In fact, in 2003, it was still estimated at only 247,223. This evolution was accompanied by a lowering of communication tariffs which decreased from 168 FCFA per minute for a call made to the same network in 2004, to 109 FCFA in 2008. The tariff for calls to other networks decreased from 190 FCFA per minute to 109 FCFA.

The Malian mobile market is shared between the long-term operator Malitel and Orange Mali, both benefiting from a global licence (fixed, mobile, internet).

Concerning the cost of calls, the table below shows the different costs of calls per minute in FCFA in each country in 2008.

Table of costs of calls made in the countries studied

Country	SIM Card (with a minimum credit of:-)	Local call to the same operator	Local call to other operators	Local call to a fixed line	International call	Local SMS
Burkina Faso	3.000	120 - 140	120 -140	120 -190	250 -1.175	30
Niger	1.000	150 - 160	150 -195	150 -195	150 -250	25-75
Senegal	1500	80 - 90	80 -90	80 -90	170 -180	10-20
Ghana		60	60	60	63	15
Sierra Leone	750	75-115				
Benin	1.000	50-100	150 -190	150-190	150 -190	15
Mali		75-130	75-130	75-90	150-190	20-30

4.6 - Satellite: a good solution but too expensive

No African country today has its own satellite, given the very high cost of this type of investment. This is what justified the creation of RASCOM (Regional African Satellite Communication Organization), which is a pan-African intergovernmental organization made up of 45 countries, whose headquarters are in Abidjan. It is responsible for defining low-cost telecommunications services based on spatial technology in liaison with telecommunications operators in these countries.

The satellite solution allows all countries to have reliable connections to worldwide networks but at a cost. The countries which still use this technology exclusively, such as Niger which pays around 33, 000,000 Euro (21, 615,000 FCFA) per month to France Télécom, has very high internet access tariffs (see summary table of internet costs).

4.7 - The media in national ICT policies and strategies

In the majority of countries covered by this study, ICTs and the media are managed by different government departments which each put into place a sector policy defined in each country. Certain programmes concern both sectors sometimes, such as Niger, with the PNCD (National Programme of Communication for Development). It was developed with the support of UNDP and UNICEF, and has made provision for an important ICT component in media capacity strengthening.

In **Ghana**, ICT policy in place has not specifically recognised the concerns of the media or radio, as pointed out by Frank Agyekum, Deputy Minister of Information and a collaborator of the ICT Director, Mawutodzi Abissath. During their interview he stated: "*Ghana does not have an ICT strategy policy for the radio or media though there is a general ICT policy for the country but not for the media exclusively. Secondly there is no national or international ICT programme for the media or radio. In some cases the state may provide funding or indirect assistance for the media especially for state owned media."*

The institutional framework is structured with a Minister of Information in charge of the media and ICT content and a Minister of Communication responsible for ICT infrastructure. These two structures work together for harmonious ICT development (infrastructure and uses). The General Secretary of the GJA (journalists' association), Bright Biewu, is confident that even if ICT policy has no "Media" component, actors in this sector should play an important role in its implementation.

Mali has only one minister responsible for Communication and ICT. Its national ICT policy was adopted in June 2005 and includes the media, in particular, support for radio and for Multimedia Community Centres (CMC). The National Policy for Information and Communication Technology document, elaborated in 2004 by the Malian government with the support of the Economic Commission for Africa (ECA), emphasises that the use of *"Information and Communication Technologies by each of the media is late and hesitating overall. Production, transmission, broadcasting and archiving equipment are still not digitalised or insufficiently digitalised. The level of training and specialisation of personnel is very low. All this is seen in the insignificant and irregular presence on the net."*

In line with implementing this policy in Mali, the Malian authorities and USAID have agreed on a large communication for development programme in using Information and Communication Technologies to create 13 CLICs (Local Centres of Information for Communication) in Kidal, Gao, Bandiagara, Mopti, Djenné, Macina, Ségou, Kadiolo, Bougouni, Ouélessébougou, Bougoula, Kangaba and Bamako.

This project aims to:

- promote distribution of information linked to development;
- promote Information and Communication Technologies resources in badly served regions of Mali;
- give local people access to Information and Communication Technologies;

- give high-quality content to the education, economic growth, agro-business, health, democratic governance, information technologies and other development sectors;
- facilitate in particular access for women and young people through promotional campaigns and prepaid vouchers;
- strengthen local capacity of CLIC management.

In **Senegal**, ICT and media management comes under two distinct departments. The ICT and Teleservices action plan recently adopted in the framework of a SCA (Accelerated Growth Strategy) does not recognise the needs of the media. There is no specific policy or national programme dedicated to the media. The Community Multimedia Centres are supervised by the Department for ICT. Regarding sector regulation, convergence also poses difficulties between audiovisual content management coming from the CNRA (National Council for Audiovisual Regulation) and infrastructure coming from ARTP (Telecommunication and Post Office Regulation Agency). Spaces where convergent products are being developed such as the Internet are not covered (WebTV, Web radio, etc.).

In **Benin**, ICTs and the media are under control of the same minister. However, it is HAAC who has extensive powers in the management of frequencies. In fact, Article 35, paragraph 2 of the organic law N° 92-021, stipulates that "*the authorisation of use of frequency for radio and television by terrestrial or satellite transmission are given to private actors by HAAC conforming to provisions of the agreement and based on a technical report presented by the Minister responsible for communication*."

The dialogue between the Minister responsible for ICT and Communication and HAAC (Audiovisual and Communication Authority) began but is now at a standstill given the misunderstandings of their respective domains. Moreover, on the question of what kind of relation exists between the two institutions in terms of ICT management, Madame Nelly Kmende, General Director of ICT says "*There is not a particular framework although there is a HAAC-MCICT committee which has existed for a while to discuss all these questions. It is within this framework that questions relative to ICT are discussed between the two institutions."*

However, in reality, the framework does not work as the conflicts on managing frequencies still remain.

In Niger, it was in July 2007 that the state adopted a strategy of universal access to communication and information services in rural and peri-urban areas. This strategy aims to give all rural communes in Niger an ICT infrastructure to access telephony and internet services between now and 2015.

Concerning the future, during the "ICT GHANA 2008" meeting, Niger had just obtained funding for a study of the feasibility and execution of a national fibre optics backbone linking Ayorou on the border of Niger with Chad. The execution of such infrastructure, has just been added to the fibre optics link planned between Algeria, Niger and Nigeria.

The successful achievement of these projects should allow radio stations all over the country to be able to access the internet at a reasonable cost.

Analysis of survey results on ICT connectivity and use in radio stations

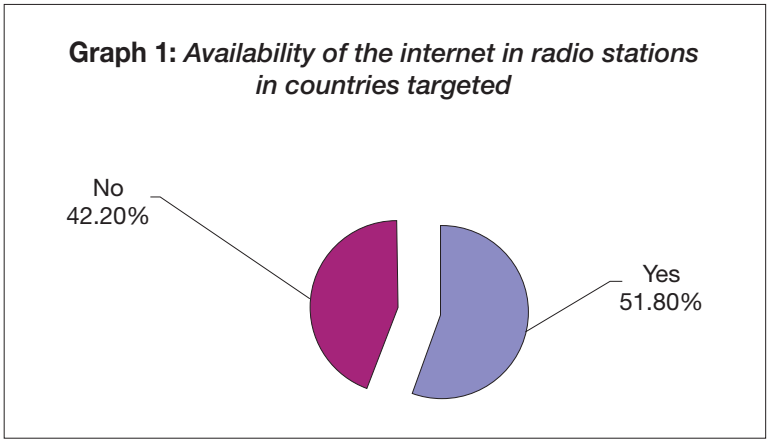
5

5.1 - Internet connectivity in radio stations

Two essential factors come into play in radio station connectivity. On the one hand, the level and quality of telecommunications infrastructure and on the other, the cost of access to the network.

5.1.1 - The average rate of Internet access

The survey reveals that out of the seven countries that took part in the study, 51.8 % of radio stations that completed the questionnaire are connected to the internet (Graph 1). This rate is an average, as there is a large disparity in connectivity related to the typology of the radio station.



Graph 1: ***Availability of the internet in radio stations in countries targeted***

In fact, we find a **much higher connectivity rate in commercial radio stations.** Of a total of 72 commercial radio stations, the connectivity rate is 72.2%, while **for community or non-profit making radio stations it is limited to 31.5%.** This difference is explained by the lack of financial means which characterises community and non-profit making radio stations generally, but also by the isolation of these stations, the majority of whom are situated in areas not covered/badly covered by the telephone network.

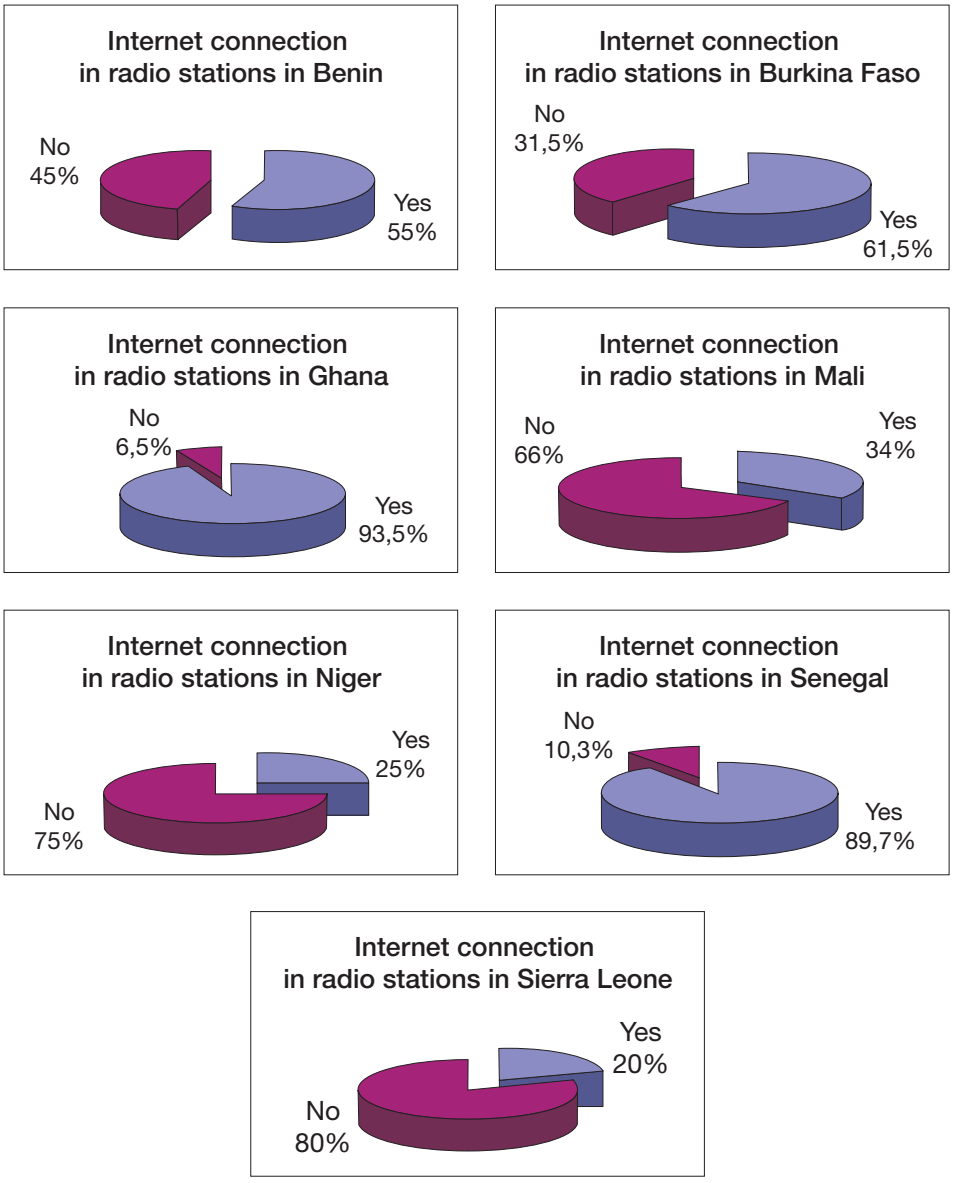
This disparity concerning connectivity is also seen between the different countries in the study. Ghana has a 93.5% connectivity rate for radio, while only 20% of radio stations in Sierra Leone and 25% of stations in Niger have an internet

connection (Graph 2). This low level of connectivity is linked to inadequate connectivity in these countries. Indeed, according to *Internet World Stats*, the penetration rate of the Internet in Sierra Leone was of the order of 0.2 % and that of Niger 0.3 % in 2007, representing the lowest rate of the seven countries participating in the study.

Access to the Internet is generally paid for by the stations themselves in more than 80% of the stations targeted, and as is often cited, the cost is too high. Regionally, according to **radio stations with a connection**, the three main problems which block connectivity are in order, the slowness of connections (49.5% of responses), the cost (39%), and power cuts (36.2%). For those **radio stations without a connection**, regionally, the cost is cited first (72.5%), the absence of a telephone line second (57.8% of responses), and the absence of a computer at the station is the third (47.1%).

The problems linked to the slowness of the network and the absence of telephone lines underline the infrastructural problems that the countries have. The example of the radio station TUKO SARI in Benin speaks volumes. Its director Hilaire Nda explains: "*In fact, the station had a connection in the past but the entire area no longer has access to the telephone, the lines having been cut for more than six months now* [the interview took place in February 2008]*. The only way to telephone is by GSM. You have to go to Natitingou, 50 km away from the station to be able to access the internet in an internet café".*

Graph 2: Radio connectivity to the internet in countries targeted



It should be pointed out that nearly all the radio stations surveyed used the internet in one way or another, whether at the radio station, in internet cafés, or using the internet connection of friends, broadcasters, journalists, managers in the organisation, but having to travel long distances to find a connection is often necessary in rural areas, as illustrated above. In these regions, on-line reactivity of managers or radio presenters is very often compromised as a result.

Concerning the length of time the establishment has had a connection, about 30.4% of the stations concerned have had access for more than three (3) years and 23.5%, between six months and a year. The countries able to access ADSL technology early on, as happened in Senegal, Burkina Faso and Ghana generally, have had access for over three years in 40% of their radio stations.

Box 3:

Interview with Ghana Community Radio Network
(by Kwami Ahiabenu II)

1. Do any of the stations have a website or one for the network?
GCRN has a domain name - www.ghanacommunityradio.org - but has yet to develop a website.

2. What are the software in use at the stations especially in the area of broadcasting and audio production?
Adobe Audition for editing and *PC DJ for play-out. Radio Ada also uses Myriad* and a programme built by one of its volunteers *(RADA player)* for play-out, which is a key innovation.

3. Do they make use of open source?
I believe *PC DJ* is open source (PC DJ: http://pcdj.com)

4. In terms of transmission and studio equipment, what is in use? And are these equipments uniform across your network?
A wide range, too many to mention. Some items, supplied through joint projects, are uniform. These comprise mainly: audio mixers, desktop computers with multimedia capacity and portable field recorders *(Marantz)*.

5. What do you consider the most innovative ICT usage by community radio stations?
If in Ghana, for the meantime, the use of mobile phones for live broadcasts (by Radio Ada and Radio Peace). Radio Ada uses a UPS as a power source, extending the normal life of a mobile phone charge to 2 hours. If elsewhere, Radio Kothmale in Sri Lanka, with its broadcast-cum-Internet facility on a motorized rickshaw that permits "radio browsing" programmes to originate even from remote villages, is considered a model.

6. What are the constraints in the use of ICTs by community radio stations?
The most basic for a number of them - no Internet access because of the absence of Internet providers. An exception is Radio Tongu, a Community Radio station in Sogakope awaiting its frequency. Partially funded by UNESCO as a CMC, it struck a deal with a new ISP in its area to share the costs of erecting a tower in exchange or free Internet access. Radio Ada tried a similar arrangement with an emerging ISP in its area - tower space in exchange for free access - but the ISP never made it and had to fold up.

7. Any perspectives and recommendations on the use of ICTs by community radios in Ghana?

The local government, Community Information Centres (CICs) should be coupled with Community Radio - but only if the Community Radio stations can remain completely independent, which may mean delinking the CICs from District Assemblies.

8. Other comments?

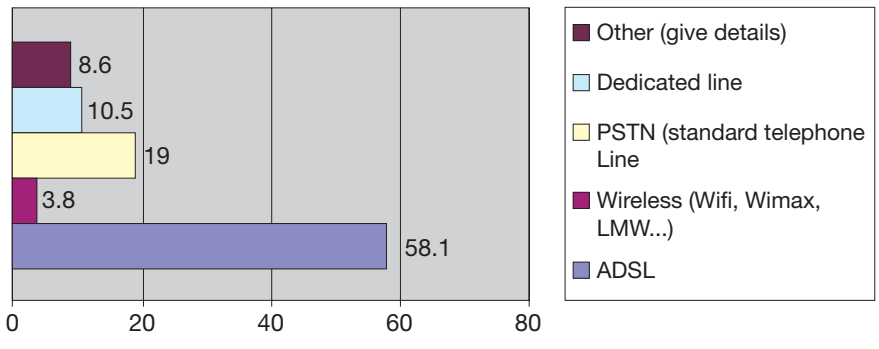
How can we get fast, reliable, inexpensive Internet connectivity to Community Radio stations in Ghana?

5.1.2 - ADSL, the most commonly used technology

The rapid development of telecommunications has allowed the possibility of broadband connection in most countries in the sub-region. ADSL technology, widespread today, represents 58.1 % of connection types to radio stations (Graph 3). The technology offering broadband is not, however, always available in all the countries concerned. In fact, it relies on the availability of a fixed line to work, while the estimated penetration rate of fixed lines in the countries targeted does not exceed 3%.

A still significant percentage of radio stations (19%) use a standard telephone line (PSTN) connection. This solution offers less speed but paradoxically costs more due to the tariff applied per minute. Among the stations that are connected by a standard telephone line, the majority are community radio stations, usually operating in rural areas, where ADSL technology is not always deployed.

Graph 3: *Type of Internet connection*



In **Senegal,** more than 92 % of stations are connected by ADSL since this technology is available in nearly all of the country, but also thanks to the low contract cost (8 000 FCFA/month for 512 kbps) which is the lowest in all the sub-region. In Mali, where the number of community radio stations is the highest in the continent, connection by ADSL, PSTN and dedicated lines is more balanced.

Box 4:

Interview of URTEL (Radio and Free Television Union of Mali)
(By Aziz Diallo)

URTEL is the first organisation created in Mali for and by radio. Criticised by numerous partners and contested by the majority of radio stations, URTEL is said to not have lived up to expectations. Despite this, its permanent secretary was willing to answer some of our questions:

Your name?
Isaie Somboro

What is your job at URTEL?
Permanent Secretary.

Do you have a specific programme to develop ICT within radio stations in Mali?
Yes, of course. In our action plan which consists of four parts, it is the third part ('Radio and ICT' component), which focuses on internal technical capacity strengthening of radio and ICT development, as well as facilitating technological transformation of ten (10) radio stations per year.

Has this 3rd part been executed yet? If so, what are its impacts?
Unfortunately, nothing has been possible as of yet.

The Department in charge grants a subsidy to radio stations every year. According to you, what is the amount of this subsidy? How is it allocated?
It is not the MCNT who grants this subsidy. It is the State who gives it. It comes from Koulouba, from the Presidency! It is 200 million CFA for the media, of which 75 million CFA is for radio. This year, the amount for radio saw an increase of 5 million CFA transferred by ORTM, which brought radio's share to 80 million CFA in 2007. Concerning allocation methods, a commission was put in place which makes decisions following criteria set up by a ministerial decree.

Do you think that this subsidy is enough to support radio in relation to ICT?
The subsidy does not even cover half the costs of radio, so it is not enough to give them IT equipment.

Do you think certain radio stations invest this subsidy in buying IT?
I don't think so.

Do you think the subsidy is sufficient?
It is not significant.

Radio stations are faced with several constraints, of which include absence or lack of familiarity with IT tools, the lack of equipment and training, the slow speed and high cost of connection. Has URTEL any answers to this?
No! But we are not sitting around doing nothing. We are negotiating with partners with a view to purchasing computers, creating CMCs, training etc.

Does URTEL have statistics concerning radio stations in the area of ICT?
No.

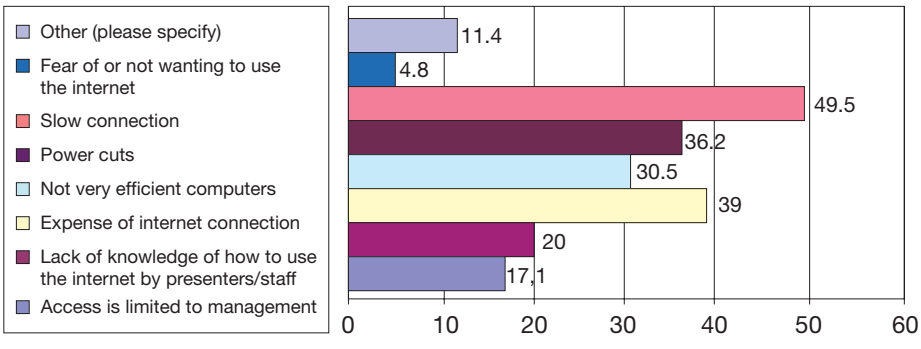
What is URTEL's approach to encourage partners in development to support radio stations in the area of ICT?
URTEL emphasizes the advantages of CMCs and CLIC in our rural areas because there life revolves around them. Showing partners that a CMC is extremely important in a rural area. Everything is done there and everything happens there.

5.1.3 - Major problems hindering use of the internet

Optimal use of the Internet in radio stations faces certain difficulties. The survey revealed that 49.5% of problems are linked to the slow connection across the sub-region (Graph 4). These difficulties are related to the level of telecommunications infrastructure or power supply.

If, in the six other countries in the study, the major difficulty is insufficient internet speed, in Senegal, sporadic power cuts remain a major handicap mentioned by 61.9% of stations who replied to the questionnaire.

Graph 4: *Problems most hindering the use of the internet for the benefit of radio in the countries taking part in the survey (response in %)*



Radio stations in Ghana have stressed the slowness of their connection in particular as a hindrance in using the Internet (96.3%). The high cost of the connection is also mentioned by 39 % of radio stations, especially in Mali, where a large number of community radio stations are in rural areas. Moreover, for 54.8% of these community radio stations, the major difficulty is the cost of internet connection. Indeed, their status of non-commercial radio with limited resources, together with the high cost of access in certain countries, considerably limits the number of stations able to have an internet connection.

Two factors are also worth drawing attention to in relation to the use of the internet. One is staff not knowing how to use the internet (20%) and the other is the processing speed of computers in the station (30.5%).

Karl Djimadja, General Director of *Radio Star* in Benin, confirms that this ignorance of the internet "*is a question of habit. There are those who find it hard to use these new means of communication and production. In fact, some do not have a high level of education and think that using the Internet and USB keys is too complicated… They prefer perhaps to record their work on a CD and transport it manually rather than get into something which they feel is reserved for the more educated. These are the problems we face and effort is needed to make people aware of the usefulness and practicality of ICT. But it is not always easy as some people remain blocked".*

It must also be indicated that regionally, **87% of unconnected stations use the internet in internet cafés** and four (4) radio stations (3.6%) indicated that they do not use the internet for their work.

Box 5:

Specific data on community radio connectivity

The rate of connectivity is quite low among 31.5% of community radio stations questioned.

Among those who have access, 42.4% use ADSL technology, while 33.3% are still dependent on a PSTN. This is explained by their huge presence in rural areas still not connected to ADSL. Despite their lack of resources, 76.5% of community radio stations pay the internet connection cost themselves. Among those who are not connected for financial reasons, many of their staff (81.9%) go to internet cafés to get connected.

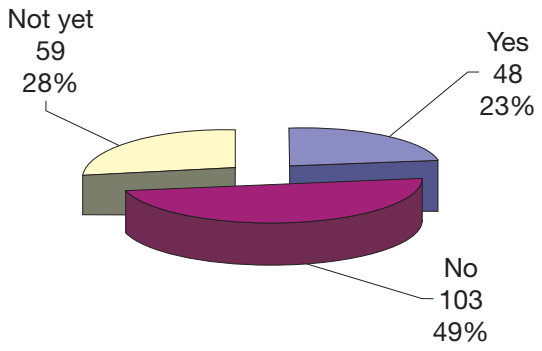
5.2 - The use of ICT in radio stations

5.2.1 - A limited presence of radio stations on the web

If the majority feels the necessity to get connected in order to research and exchange information through e-mail and discussion forums, most radio stations in the targeted countries have still not taken steps to create a website. In fact, only 23% (48 radio stations) have a website in the sub-region (Graph 5).

Coupled with the lack of financial resources available for the creation of a website, radio stations in the sub region also do not see the necessity of investing in a website. In Ghana, where the number of private commercial radio stations is the largest, around 55.2% of radio stations have a website while none of the radio stations surveyed in Sierra Leone had one.

Graph 5: *Radio station websites in the region*



The lack of websites dedicated to radio stations is much more common amongst community radio stations. Indeed, out of a total of 108 community radio stations, only 12 have a website, which represents an average rate of 12%, although after checking, only six (6) websites are operational. The prerequisites of having a website are first a connection, something rarely available among community radio stations. A slight improvement can be seen, however, since the last study carried out by PIWA in 2004.[22] Of the 32 community radio stations surveyed, none of them had a website. However, the scale of this advance is still quite limited.

22. PIWA, Les médias et Internet en Afrique de l'Ouest, PIWA, 2004; **http://www.panos-ao.org/ipao/spip.php?article2556**

The only radio stations that have their own websites are those with project funding, or those that belong to press groups. For example, the rural radio station of Kayes owned a website which cost 120 000 FCFA per month, yet the website was shut down due to the inability to pay the monthly fee in the long term.

Setting up a website also demands efforts in keeping it up-to-date on a regular basis. In countries where the number of stations with a website is highest (Ghana, Senegal and Benin), updating takes place daily, since the stations that belong to press groups need frequent updating. However, radio station websites in countries such as Mali, Niger and Burkina are rarely updated.

It should be noted that, regionally, 48.1% of radio stations state they do not update their websites regularly and 9% update them once/month (i.e. more than half of radio stations do not update their websites very often). At a community radio level, regionally speaking, these figures are even higher (76.9% and 9% respectively).

See Appendix 4 for a list of about 70 websites of radio stations identified.

Box 6:

Use of mobile phones by Radio Golf FM in Benin

In 2003, Radio Océan FM was the first radio station to retransmit football championship matches during the week. This was thanks to a GSM operator who, on the basis of an exchange contract, offered communication credits to the radio. The use of mobile phones by radio stations however, would evolve in Benin during the presidential elections in March 2006. Thanks to this tool, radio reporters were able to show the great moments of the election live which marked an important turning point in the political history in Benin. As can be seen in this interview of Euloge Aidasso, Director of Golfe FM (interviewed in 2006 by Hippolyte Djiwan, responsible for the survey in Benin, whilst writing his book "ICT and the elections in Benin" (unpublished)).

How did you cover the presidential elections in 2006?

To cover the first round of the presidential elections, we deployed 10 teams of at least three (3) reporters on the ground. The teams covered all the territory; there was also a back-up team who was always on stand-by, and able to give support to any of the teams close to the station or not too far from Cotonou. In short, 11 teams or about forty (40) people, if you take into account the back-up team based in Cotonou.

What did you use for retransmission on the ground?

Mainly the telephone. There were no other technical means used but that. It is true that we are a press group with a radio and television station, but the radio and television were synchronized for the event. What was used on radio was also shown on television. Everything was done by telephone and it was later that we used images for television.

Were conventional lines used?

No. All the reporters or correspondents were connected by mobile phones. Only mobile phones were used; calls were made using the GSM network.

Why the preference for GSM?

It is more useful and practical for reporters. The instructions were to reach them at any given moment in order to experience the event as it was happening on the ground, yet only mobile phones were capable of giving information in real time. Also, you have to realize that access to conventional telephones is not available throughout the country. However, if there were still problems related to GSM coverage, we managed to use it.

Is there a particular network that you used for retransmissions?

All of them but it must be said that Télécel was used the most, followed by Areeba. These are the two main networks used. In the beginning, we had some problems with Bénincell (*Author's note: Bénincell became Areeba then MTN*). The network was saturated, but then we were able to use it normally. Some reporters used the Libercom network, followed by Télécel, Areeba and Libercom.

What advances in technology have been made between 2001 and 2006?

In 2001, we used GSM networks and conventional lines in some regions. This time, we only used mobiles since they cover more of the regions and the reporters had less trouble in the interior of the country to make the link.

Are you satisfied with the use made of ICT in your work?

Yes, but not how we would have liked. We still have not maximized on all that ICTs have to offer. We only use mobiles and very few organisations including ours use other means e.g. using the internet to send "wrapped" news or sound, or to make the most use of information on websites

What do you think are the causes?

The obstacles exist on two levels. The first level being equipment and the second training. It must be stated that very few journalists are really knowledgeable about ICT and very little editing uses the latest technology. Nationally, a real ICT policy fails to exist. We have a government department responsible for new technology, which is a good sign but it is not enough.

And yet Benin has an ICT policy!

That shows there is a problem of communication. If we speak of ICT, journalists should be the first to be informed and to master the subject.

5.2.2 - Streaming (audio content on-line broadcasting) and Podcasting (downloading of audio content): a lack of expertise

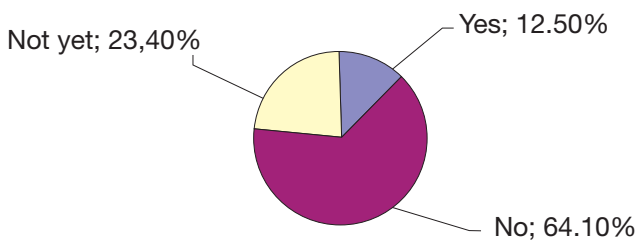
One of the most interesting possibilities offered by ICT today is *streaming*.

Box 7:
What is *Streaming?*

Technology used for the dissemination of "live" content (or slightly delayed), it allows for the reading of an audio or video stream while it is being broadcasted. Streaming is different to broadcasting by downloading which needs, for example, to recuperate all the data from a file or video extract before being able to listen to or watch it. Access to radio has thus become possible for all listeners/ internet users and in real time.

This technological innovation is only used by 12.5% of radio stations surveyed (Graph 6).

Graph 6: *Use of streaming audio in countries surveyed*



Indeed, out of a total of 220 radio stations, only 24 (12.5%) put their content *live* on their websites. **However, after checking, less than half of those who responded in the affirmative were streaming content in July 2008.** (It was noted that in certain cases, occasional technical problems, often or sometimes, caused streaming to halt, before being reactivated after a few days or hours). The cost of the operation still being relatively high, it is mainly commercial stations with greater means at their disposal, who are using this. In fact, 83.3 % of stations who "stream" are commercial stations. Ghana and Senegal are the countries with the largest number of pioneering radio stations, with 41.7% and 33.3% respectively of the stations surveyed.

According to the survey results, *streaming* is still not an innovation which has been adopted because 77.4 % of radio community stations still don't use it.

Box 8:

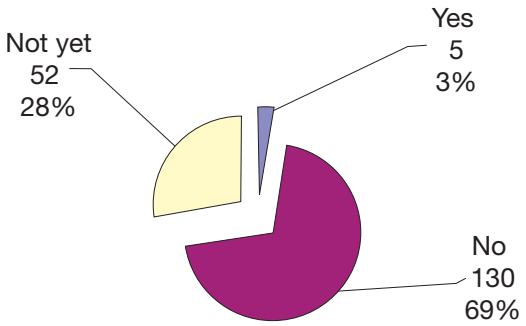
Xalima.com, a site hosting several radio stations in Senegal

Independently of the results of the survey questionnaires, it was noticed that in Senegal, a group based in the USA (Sunuware Group) were displaying a list of a dozen radio stations hosted on its news portal www.xalima.com (including community and private radio stations). It was also noticed that now and then there was an interruption in streaming and that some stations were quite simply not really on-line. Other radio stations are web radios, broadcasting exclusively on-line. At the beginning of October 2008, the xalima.com site had become inaccessible.

On the international website **www.comfm.com**, which counts the number of online radio stations and television channels, a quick examination shows that at the beginning of July 2008, the majority of West African radio stations which were counted as streaming did not do it or quite simply were no longer online.

Podcasting is a process which allows you to put audio on a server so that listeners can download it. It is a new service offered by ICTs to radio and television stations. Its use remains limited, despite the availability of hosting server at affordable prices.

Graph 7: ***Does the radio station make audio content available for downloading?***



Commercial and public radio stations are the only stations that use *podcasting*.

Box 9:

What is podcast/podcasting?

A way of broadcasting audio or video files on the internet, for download, with the aid of specific software.

According to the management of the stations surveyed, the advantage linked to putting "*streaming"* and "*podcast"* into place, is mainly the rise in audience ratings. In fact, the availability of the radio signal on the internet allows listeners outside the standard coverage areas to access radio programmes, in particular, the diaspora living abroad.

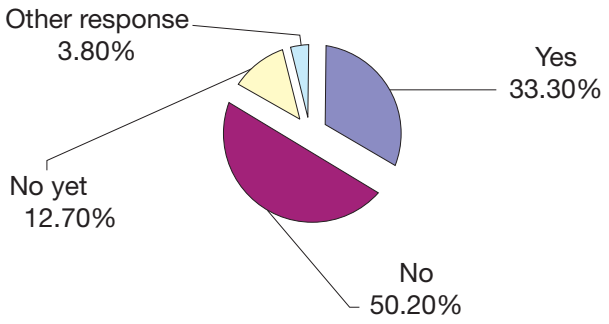
One of the major constraints experienced by radio stations is the low level of technical expertise in radio *streaming* and *podcasting* and the slow connection speed which is important to ensure listening quality on the internet.

These technological innovations are seen as ways of helping the African diaspora stay connected with their country of origin.

5.2.3 - The use of satellite for the reception and broadcasting of radio programmes: An innovative solution but which remains expensive

Satellite is used to receive programmes by 33.3% of radio stations that answered the question (Graph 8). Community radio stations use satellite for reception the most at 57.7%; for commercial radio stations, this figure is 28.8%. This high rate of use by community radio is explained by the fact that reception and equipment costs are borne by radio partners. This is the case in Niger, where 22 out of 32 stations use satellite as a source of important information.

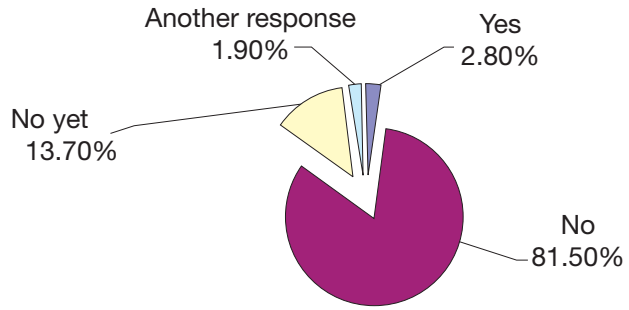
Graph 8: *Does the station use satellite for the reception of audio programmes*



Despite the advantages linked to using satellite for reception, constraints were highlighted by radio stations. There are technical problems linked to programme reception, the timing of programme reception which does not always coincide with radio operating hours or the times people want to listen, but also languages used, often foreign to the local population. Other radio stations just use satellite for synchronising programmes with the parent radio (public radio stations in the capital), whilst others have used satellite reception for a short period, before stopping due to budgetary or other reasons.

The use of satellite for broadcasting programmes remains relatively limited because of the cost linked to broadcasting equipment. In fact, only 2.8% (6 out of 211 radio stations replying to this question) of stations use satellite to broadcast programmes (Graph 9).

Graph 9: ***Does the station use satellite for broadcasting its programmes?***



It is mainly public radio stations such as RTS in Senegal and RTB in Burkina, coupled with television channels that are retransmitted in Europe and the USA by satellite. **83.3% of radios using satellite for broadcasting are public channels.** Only *Walfadjri*, a private radio station based in Senegal, has been identified as using satellite for broadcasting its programmes. This is not the station's first experience. In fact, it had tried international broadcasting in partnership with WorldSpace at the end of the 1990s. The annual cost of broadcasting programmes by satellite worldwide was 140 million FCFA on top of the cost of putting up the satellite, billed by the national telecommunications operator at 3.5 million FCFA.[23] This experience from the point of view of the channel's reputation was successful, but was a total commercial failure.

The countries in the sub-region use several satellites for communication needs in general, internet connectivity, broadcasting or reception of radio and television programmes. The most popular are Afristar for WorldSpace and RFI programmes, Eutelsat's Atlantic Bird for Deutsche Welle and Intelsat programmes, in particular for broadcasting some public radio programmes.

The satellite reception only requires the purchase of receiver equipment. This equipment is generally made up of a satellite dish, a decoder and if necessary a computer. Reception costs are generally very little for radio programmes. They are paid for, in the main, by external partners who wish to extend the broadcasting range of their radio programmes.

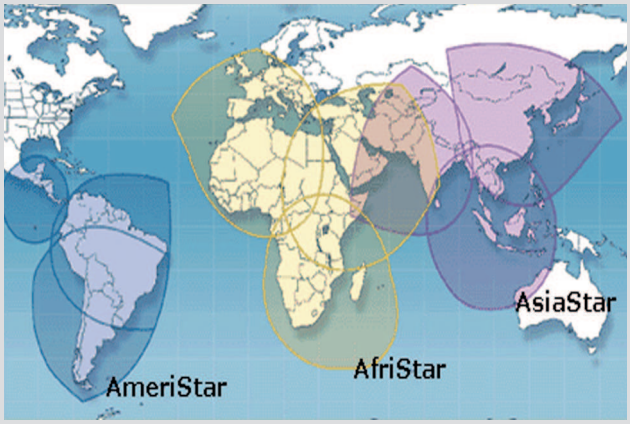
23. http://www.panos-ao.org/spip.php?article2643

Box 10

The system of WORLDSPACE satellites

(Source: www.worldspace.com)

WorldSpace supplies direct audio and multimedia broadcasting services by satellite, mainly in emerging regions in the Middle East, Africa, the Mediterranean, Asia, the Caribbean and Latin America, who often have little choice in media. These zones are covered by three (3) geostationary satellites (AfriStar, AmeriStar and AsiaStar). Today, **Afristar and AsiaStar** are operational.



AfriStar at 21° East

AsiaStar at 105° East

AmeriStar at 95° West (not available)

The **WorldSpace** system is the first digital broadcasting system with worldwide coverage, capable of providing dozens of high quality audio channels as well as auxiliary services with mobile receivers.

WORLDSPACE TECHNOLOGY

Satellites: The satellites, which each weigh 2,800 kg, are made up of two parts: a "useful load" dedicated to broadcasting functions and a "platform" for flight management and manoeuvres. The satellites are commanded by ground stations situated in Washington (AfriStar), Australia (AsiaStar) and Trinidad and Tobago (AmeriStar). The satellites are placed in orbit 36 000 kilometres above Earth. Their life span is 15 years.

WorldSpace Audio-digital Technology: Audio-digital broadcasting technology developed for WorldSpace is different from the Eurêka 147 standard developed in Europe. It is based on the use of the compression technique defined by the ISO international MPEG-2 Layer 3 standard. The satellites function in L band frequency between 1452 and 1492 MHz. (attributed to the digital radio broadcasting service by satellite during the CAMR 92 conference).

Each satellite can transmit 24 hours out of 24, on each beam, a total capacity of 1536 kbps, multiplexed over time. Depending on the capacity of the channel used (expressed in kilobits per second), the quality of sound can go from mono amplitude (16 kbps) to CD sound (128 kbps). Thus, the capacity of satellites allows each beam FM quality 96 mono audio channel or 48 mono audio channels or 24 stereo audio channels, or 12 CD quality stereo channels, or whatever combination of these types of signal (48 mono audio channels plus 6 CD quality stereo channels, etc...). The whole Worldspace System can thus incorporate 432 mono music channels, or 216 stereo FM sound channels or even 108 CD quality channels.

A minimum of 32 kilobits/second is recommended for radio broadcasters to have a sound quality at least equal to mono FM. The sound quality of musical programmes is hence mainly guaranteed. On top of this, for its non-musical programmes, the radio broadcaster can divide its channel of 32 kilobits in two channels of 16 kilobits in order to send two different programmes on satellite (possibly in different languages) at the same moment. For high quality musical programmes (at least FM stereo), channels with 64 kbps capacity should be used. Using digital technology, WorldSpace satellites can, apart from radio, broadcast other types of information (text, radio mailbox, data, images, faxes...).

Radio stations: Radio broadcasters transmit their programmes directly to satellites, which broadcast them to WorldSpace receivers.

Upstream signals (from radio broadcasters to satellites) are transmitted from terrestrial stations situated anywhere in the area where the satellite is visible under an angle of elevation greater than 10°. These uplink stations can be small individual stations of the V-SAT type or broadcasting centres shared with other broadcasters.

The signals are sent to satellites thanks to small transmitters of 10 -100W and V-SAT type antennae of 2 -3 metres diameter. Each transmitter antenna can give access to twelve (12) satellite channels (four channels being needed for a stereo CD quality).

Receivers: Radio programmes transmitted by satellites are captured with the help of a new type of individual receiver. They can be fixed, portable or vehicular and work with batteries or by mains. Multipurpose, they can capture digital programmes from satellites, but also conventional AM and MF short wave programmes. High quality entry-level material equipment assures a quality of sound comparable to that of portable radios; they can be linked to a hi-fi stereo sound system to benefit from high definition sound, or to a computer to ensure the reception of multimedia programmes.

Broadcasting programmes by satellite in contrast, is a very expensive operation which radio stations that operate on their own resources cannot sustain. In fact, 80% of heads of radio stations mention the high cost as the main reason for not using satellite. Among the six (6) stations questioned (*Radio Sénégal International*, *Radiodiffusion Nationale du Bénin*, *la Voix du Sahel* in Niger, *Radiodiffusion Burkinabé*, *UniqFM* in Ghana and *WalfFM* in Senegal) that use satellite, four (4) bear the cost of broadcasting themselves. The cost is paid for directly by the State (Niger and Burkina) for the other two. It must be said, apart from the private station, which relies on its own resources, all the other radio stations concerned are public and so are directly or indirectly supported by public funding. Furthermore, more than 66 % of these stations express their satisfaction with the *political mission* of the radio station regarding the advantages of broadcasting by satellite.

Box 11:

OrdiSpace of RFI[24]

OrdiSpace is a programme broadcasting system developed by RFI to simultaneously supply its network of radio partners in Africa.

The simplicity of use of OrdiSpace and its specificity make it a natural vector between actors of development and the African people.

The installation of more than 250 OrdiSpace terminals has created a real network joining together a large public.

Today, OrdiSpace is available for international organisations and all other operators wishing to communicate to Africa occasional or regular information, awareness-raising or preventative action.

Direct communication with radio stations

OrdiSpace allows even small isolated radio stations to receive audio, text and image data by satellite quickly, directly and in total confidence.
The OrdiSpace receiver terminal, mini-computer linked to a WorldSpace satellite antenna, can store more than 2,500 hours of audio programmes. It is equipped with a pre-installed database of musical programmes. This tool was created in response to two objectives for radio stations:

- reception of programmes ready to broadcast: each day new programmes/content sent by satellite are downloaded automatically on OrdiSpace, enhancing existing archives;
- broadcasting piloting: thanks to this mini-computer, radio stations also have the possibility of developing their programme continuity, programmes listings and/or their play lists and to then automatically broadcast them.

Local trainers

The simplicity of using OrdiSpace only requires minimal training. However, in order to assure installation and to respond to any maintenance problems with the OrdiSpace terminals, RFI relies on local technicians. They train the users, respond to their needs and can quickly respond to any breakdowns which may occur.

Receiving data

The terminal registers the data directly sent from WorldSpace's AfriStar satellite.

Each programme can be sent in a way designed to target specific radio stations and sent twice– at a fixed time at the beginning and end of the day – in order to overcome any possible power cuts during transmission.

Sending data

Access to the network is also very simple. Content can be sent from any part of the world, access being completely secure and controlled by RFI. The editor accesses his/her internet account and has megabyte credit from which each piece of data sent is debited. About one megabyte is needed for each three minutes of programming.

One of the advantages of "push satellite" is to assure the unvarying cost of transmission, whatever the number of recipient radio stations. To address content to selected radio stations precisely, the editor has different criteria to choose from - geographical location, type of public, format, etc.

More than 250 radio stations in 38 countries are already equipped, with about fifty (50) in Mali, thirty (30) in the Democratic Republic of Congo, about fifteen (15) in Togo, around twelve (12) in Burkina Faso and in Central Africa…

RFI has several service levels, from simple directing of programmes to targeted radio stations, to creating campaigns and producing programmes or commercials.

In this way, the National Agency for Employment in Bamako addresses its offers of employment in Bambara and in French to Malian radio stations twice a week, via the OrdiSpace network, produced in Mali by a partner radio station of RFI.

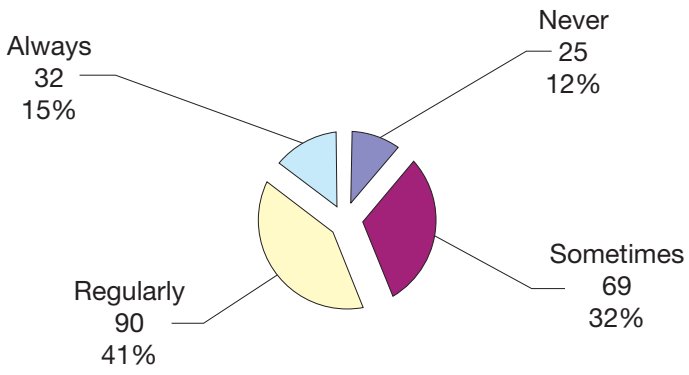
Another example, information messages on voting details in the national language, sent on behalf of the DRC's Independent Electoral Commission on the eve of the 2006 presidential election.

RFI's extensive means of production and its partners (in the case of programmes made in national languages) can be mobilised in order to ensure optimal quality of programmes and their suitability for the targeted public.

5.2.4 - The use of mobile telephones, SMS and interactive vocal servers

Mobile phones are used by journalists to carry out long distance reports because of the fact that they are accessible and easy to use. In fact, 41% of radio stations surveyed that replied to the question said they use the mobile phone regularly for reporting and 15% said they use it all the time (Graph 10). Thus, we can see that more than half of all radio stations use the mobile phone quite regularly for their work.

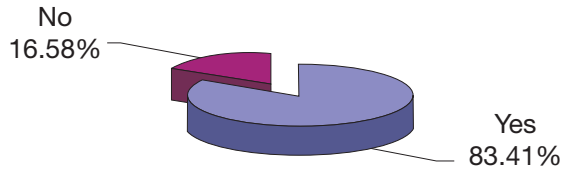
Graph 10: *How often do radio presenters/journalists use mobile phones for reporting?*



Today the mobile phone is used by community, non-profit making and commercial radio stations as a means of strengthening people's participation in their community by giving them a voice. Commercial radio is the biggest user of phones with 51.4% of these stations working regularly with mobile phones to interact with listeners and 15.7% saying they "always" use them. Community stations also use them regularly - 42% of them in contrast with only 14% who always use them. On the contrary, public radio stations use mobile phones the least with only 31% of stations using them regularly in contrast to 10.5% who "always" use them. These public stations seem to have preserved their prime function exclusively as programme broadcasters but it is also possible that they use fixed lines more than private organisations and structures, as public institutions have easier access, to them.

The most commercialised mobile service remains the SMS (Short Message Service) which allows the exchange of short texts with listeners at low cost. Of a total of 211 stations who answered this question, SMS is used to communicate with listeners by 176 stations, which represents 83.41% (Graph 11).

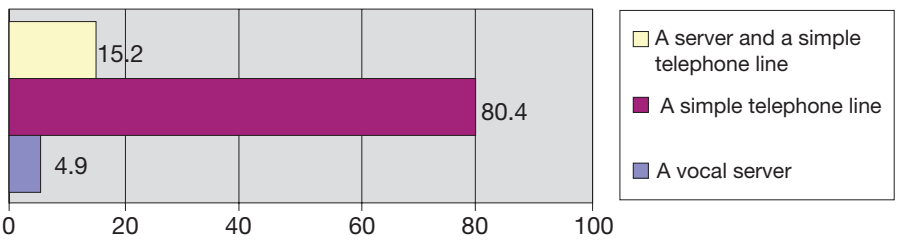
Graph 11: ***Is SMS used between listeners and station presenters during radio broadcasts?***



SMS is seen as a means of ensuring interaction with listeners. It is also used for games and voting on air. In commercialising this new service, stations can earn substantial additional revenue. In fact, the cost of sending messages paid for by listeners is divided between telecommunications operators, SMS service providers and the radio station itself. Of the 108 community radio stations surveyed, 83 of them use SMS services to communicate with listeners, strengthening access to the media by people living in rural areas difficult to reach.

Exchange between listeners, journalists and presenters, is also ensured through fixed lines connected to a vocal server or directly to the radio control room. Given the inadequate fixed line network in the sub-region, this technology is more or less developed depending on the country. Most of the stations use a direct fixed line to communicate (80.4%), whilst only 4.9% use a server exclusively (Graph 12). In contrast to Niger where no radio station uses a vocal server, in Senegal, there are four (4) stations (representing 13.8% of the number of stations that answered the question) that use a server and fourteen (14) that work in a mixed environment, with a server and a fixed line. Community radio stations use a direct fixed line (60 %) much more than vocal servers (4.6 %).

Graph 12: ***What does the station use to communicate with its listeners?***



The use of a vocal server allows listeners to communicate directly on air, but also brings additional revenue to stations with profits shared between operators, vocal service suppliers and the station itself. Although this solution is profitable, from a technical point of view it is more complex and requires highly trained staff to handle it. Stations prefer to use fixed telephone lines without any financial fallout, rather than risk disturbing listeners calling the radio station.

Box 12:

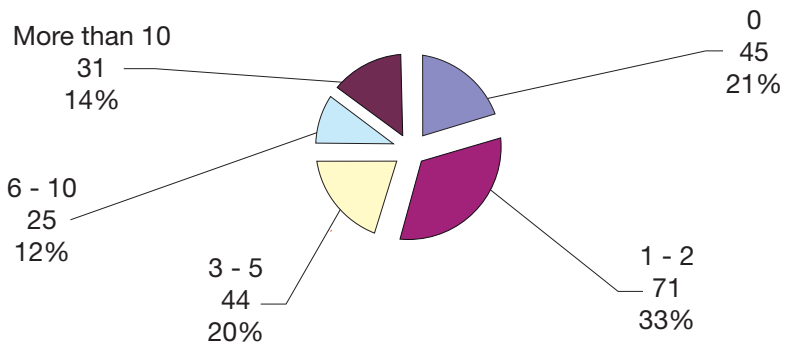
Example of how vocal servers work in Senegal

When listeners call a radio station which has a vocal server installed by a service provider, the call is billed at 140 Fcfa/min. At the end of the two-month period, the amount raised is shared between SONATEL, the vocal service provider and the radio itself (70 FCFA each). The revenue received by radio stations can vary between 300,000 FCFA and 3,000,000 FCFA depending on the size of the radio and its coverage zone. WalffM and JappoFM in Senegal have vocal servers.

5.2.5 - IT equipment and free software

A prerequisite for accessing the internet is the availability of computers. The stations in the countries involved in this study are not always well equipped. 21% of stations do not have computers (Graph 13) but 14% of stations have more than ten (10) computers. Niger and Mali are the least well-equipped with 56.1% and 40% respectively of stations having no computer, whilst 63% of stations in Ghana have more than ten (10) computers and 50% of stations in Senegal have between three (3) and five (5) computers.

Graph 13: ***How many computers does the station have?***

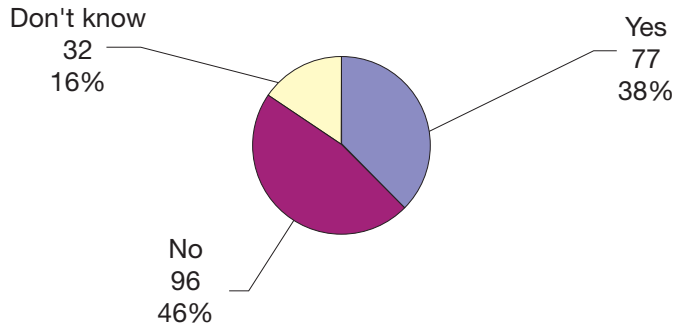


Moreover, the survey has shown that community radio stations, whose resources are limited, are the least well-equipped in IT. 33.6 % of stations do not have computers and 40.2 % have 1 - 2 computers which are obtained mainly through donations from external partners. In Sierra Leone, 20% of radio stations do not have computers and 66.7% only have 1 - 2 computers. The best equipped stations are found in Ghana with 56.7% of radio stations having more than 10 computers.

It should also be pointed out that in most cases computers in radio stations are often second-hand.

The use of free software is not very frequent in radio stations. The results show that 38% of stations that replied to the questionnaire use free software, with a large number in Sierra Leone (86.2% of stations), in contrast to Niger with only 13.3% of stations. (Graph 14).

Graph 14: ***Is free software used in the station?***



The free and low cost nature of free software should be of interest to community radio stations. In fact, 43 % use this software, whilst commercial stations, enthusiasts of all that is free, only represent 30.3 %. The software most used in the stations is that used for digital production such as Cool Edit, Audacity and Raduga.

A lack of understanding of free software is sometimes observed among a certain number of people as when they are asked to give examples of software used, they often mention proprietary software.

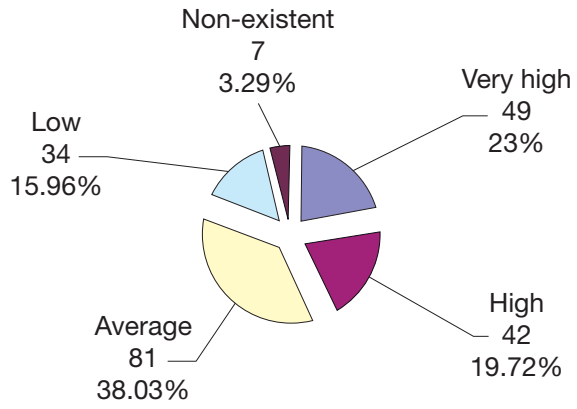
5.2.6 - Digital supports

The convergence of ICT and the media has accelerated the development of digital supports such as DVD, USB keys and player recorders. Multimedia supports, with increasingly greater storage capacity, have facilitated the production, mobility and archiving of radio programmes.

The use of CD and DVD is judged average in 38.03% of stations and 23% of them have a very high rate of use (Graph 15). The level of use in the countries targeted is the same overall with the exception of Ghana, where 65.4% of stations have a very high rate of use in contrast to Sierra Leone, where 46.7% of stations have a low rate of use.

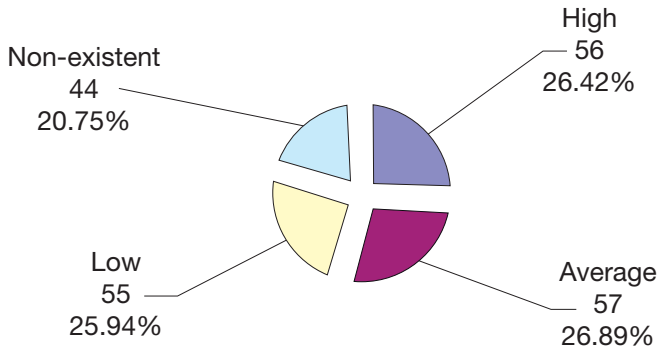
The rate of use of digital supports is judged very highly by 44% of commercial stations that are generally located in urban centres where the equipment is generally accessible, whilst only 12.3 % of community radio stations have a high rate of use.

Graph 15: ***What is the rate of use of CDs or DVDs at the station?***



The era of magnetic tape recording and playing equipment is over; today digital versions offer storage capacity that is at least 10 times greater. According to the results of the survey, 26.89 % of stations have an average rate of use, a large number of stations (26.42%) use it to a large extent, while the rest consider their use of digital playing-recording equipment low or non-existent (Graph 16). The lowest rate of use is in Mali with 27.7% and in Niger, 65.6% of stations say that this type of equipment does not exist.

Graph 16: ***How often are digital players used in the station?***

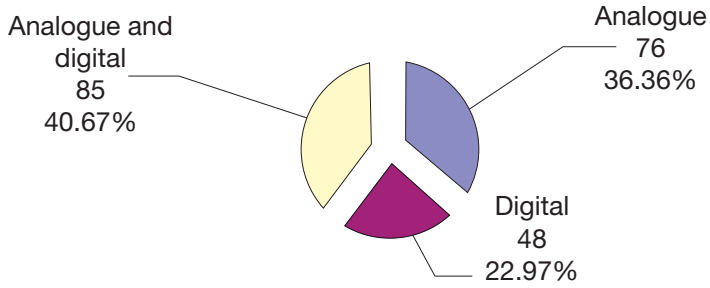


The breakdown based on the typology of radio stations shows that digital recording equipment is non-existent in 33.7 % of community radio stations, while they are only non-existent in 11.6% of commercial stations.

5.2.7 - Audio-digital production

Today, ICTs have greatly facilitated editing and audio broadcasting functions, but updating equipment to ensure the transition from analogue to digital needs substantial financial means. The radio stations involved in this study have still not completely made the jump. In fact, only 22.97% of the stations use digital editing exclusively in their production while 36.36 % of them still use analogue (Graph 17). The transitional phase in which analogue and digital tools are used at the same time remains the most usual situation among 40.67% of those stations surveyed.

Graph 17: ***Within the station, audio production is:***



Analogue production is still very present in Niger where it is used by 65.6% of stations. On the contrary, Ghana whose specificity includes a high number of private stations is marked by very advanced digital use of its audio production by 62.2% of radio stations.

5.2.8 - Examples of innovative use combining new technology and radio

The use of the internet by radio remains largely standard: exchange of mail with partners and listeners, occasional research of online information in the preparation of programmes (on health, agriculture, politics, sport, culture, international news, etc.), working on websites online. With the mobile phone, new uses are appearing and being developed as illustrated above. A certain evolution can be seen, compared to previous studies carried out by PIWA: the development of internet access in different countries and at the level of radio stations (particularly the democratisation of ADSL in course) encourages more exchange between listeners and presenters or management in radio stations.

The following sections give some other examples, concerning a regional radio and two radio stations in Senegal and Ghana.

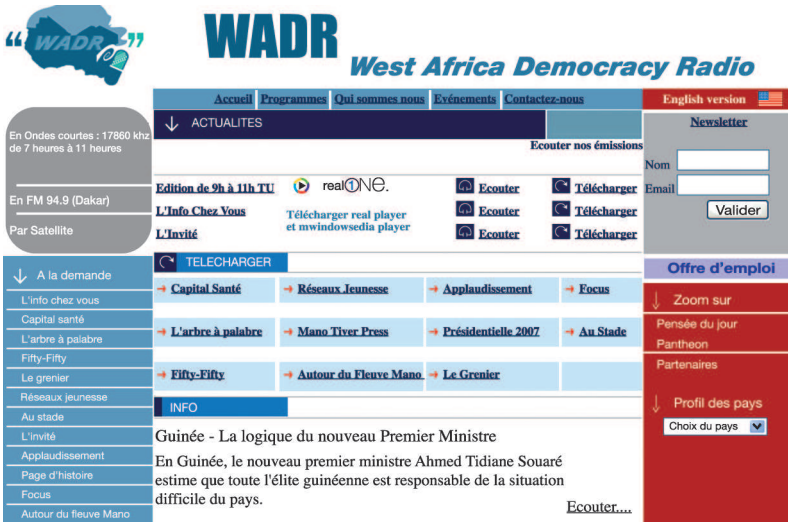
5.2.8.1 - The experience of a regional radio station: WADR

West Africa Democracy Radio (WADR) is a radio station in the West Africa sub-region started by an NGO, OSIWA (Open Society Initiative for West Africa), in August 2005. The objective of WADR is to facilitate exchange and development of information between people, and acts as the centre of a network of public, private and community radio stations that it supports by providing its listeners with a forum for inter-community dialogue. WADR defines itself as an independent non-profit making radio station.

WADR's headquarters is in Dakar, Senegal and an office has opened in each of the three member countries of the Mano River Union (Guinea, Liberia and Sierra Leone). The Dakar office is supplied with news and reviews by local staff. The information is delivered in both English and French.

The radio station is interested above all, in people living in rural areas, deprived of media coverage by a local radio station.

Radio WADR mainly relies on ICTs for transmission and broadcasting of its programmes throughout Senegal, Guinea, Sierra Leone and Liberia, but also for broadcasting by internet with the possibility of downloading WADR programmes.



WADR Radio website: www.wadr.org

Correspondents based in the various countries produce programmes, reports or information bulletins which are transmitted to Dakar Headquarters to be treated. This transmission is done exclusively by **internet**, despite the problems in the quality of access and notoriously high cost in these countries. In fact, the offices installed in the other countries use VSAT antennae for internet broadband connection to ensure quality programme transmission. *"High quality broadband connection in these countries is extremely expensive and we are permanently looking for more reliable and less costly transmission solutions",* says Abdoulaye Diakhaté, Technical Advisor for WADR.

The programmes made, based on the information coming from the countries, are then transmitted from 7am to 2.30pm on FM in Dakar as well as the other countries. The solution is to send them to the satellite covering the countries concerned. The public can receive programmes directly by satellite, or by a signal relayed and re-broadcast by FM transmitters locally.

Today, the largest constraint that WADR has confronted has been the cost of programme transmission by **satellite** and internet connection by **VSAT** antenna, to get broadband. In fact, in three of the four countries concerned (Sierra Leone, Guinea and Liberia), telecommunications infrastructure is largely inferior to the average seen in the sub-region, and the cost is exorbitant.

WADR programmes are usually broadcasted by a transmitter situated in London (VTCommunication) by **short wave transmission.** The use of short waves is justified by the need to cover a large surface area, including the most isolated areas in the targeted countries and the availability of cheap radios which can capture short wave.

The WADR website also offers internet user programmes which can be downloaded **(podcast)** on all the topics covered by the radio station. The programmes downloaded are summarized on the website to give an idea of the audio content. The website many advantages, as Abdoulaye Diakhaté who works for WADR further elaborates *"We receive very positive reactions through the website from fellow country men in the countries concerned; in particular those who live abroad because for many of them communication was interrupted because of war."*

5.2.8.2 - Jappo FM (Senegal), a community radio station staking the future on ICT

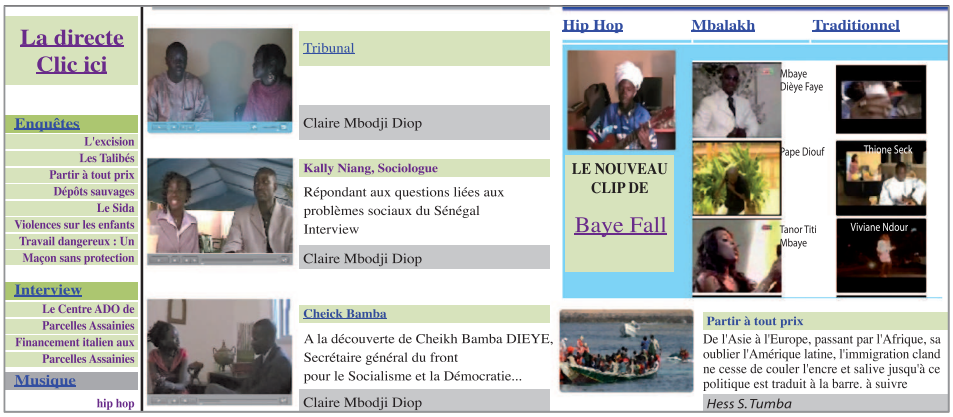
Jappo FM is a community radio station in *Parcelles Assainies*, a suburb of Dakar (Senegal) established in 2004, thanks to a partnership between the NGO *Connexion sans frontière* and the town council of the commune *Parcelles Assainies*.

Jappo FM defines itself as a medium of change and tool for spreading awareness, information, education and training for the inhabitants of the commune. Lamine Ndiaye, the Administrative Advisor affirms that *"The radio programme is based on social issues such as education and culture, sport, health, economic and social questions."* With very limited financial and material resources, the radio station is committed to the use of ICTs to cut costs while achieving its mission of providing local information, while surviving without subsidies.

People in the commune have also mobilised themselves around an initiative of forming radio support clubs to strengthen activities to ensure sustainability of the station.

Many activities combining ICTs and radio take place within the station. The option of all digital was decided from the beginning of the radio station. In fact, according to Karim Cissé, Executive Secretary of the NGO *"Connexion sans Frontière*" who helped in creating the radio station, *"In digitalising audio-visual channel production, using a digital dictaphone, digital editing and computer-assisted animation, the radio station has gained professionalism and become more efficient which will have a definite impact on audience ratings."*

The radio station was set up along with the **website** (**www.jappofm.net**) seen as complementary and which relays productions in real time. It allows radio to be broadcast live. **Streaming** is assured thanks to a platform hosted in Europe at a reasonable cost (around 20.000 FCFA per month). The originality of the station is in the production of video reports on social issues which are treated by the radio station. The reports, available for downloading **(podcast)** are produced by a team of volunteer journalists and technicians who provide digital editing, thanks to the support of an Italian technician, who is also a volunteer. According to the expert, the difficulty of consolidating technical teams is a reality in the multimedia sector. The staff often times leave after having been trained and given the necessary skills.



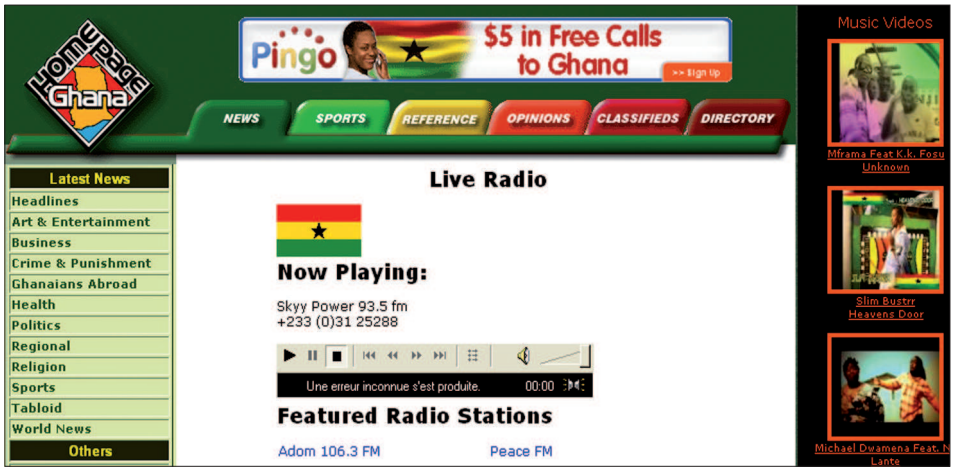
JappoFM's website

In the absence of any substantial funding, Radio Jappo FM also uses ICTs to ensure its survival. The directors depend on revenue generated by value-added services in order to pay for certain station activities. In fact, thanks to a **SMS** service operator partnership, game show activities and the sending of messages by the radio station are organised and revenue is shared between the station and the operators. The **vocal server** also works on the same principal of sharing revenue taken from calls, which are charged to the listeners.

5.2.8.3 - Radio Skyy Power FM (Ghana)

Radio Skyy Power FM (Ghana) was established in October 1997, and is now the leader in the Ghanaian radio landscape. It has a 5 KW transmitter which covers several towns in Ghana (Sekondi-Takoradi, Tarkwa, Prestea, Asankraguaa, Fosu, Obuasi, Fomena, Axim, Half-Assini, Elubo and parts of the Ivory Coast, Saltpond, Cape Coast, Mankessim, Twifu Praso, Ateiku and Winneba).

The station programmes are transmitted live non-stop on its website (streaming). The group has also had a private television licence since 2004, and has a presence in the press.



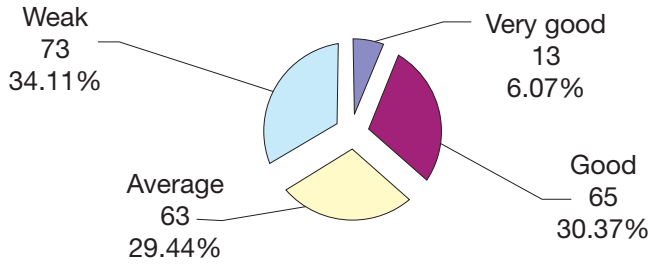
SKYY POWER 93.5FM website

5.3 - Skills of radio station staff in using ICT

5.3.1 - An evaluation of radio station staff skills

The evolution of technology has not aligned with the development of human resources. Indeed, the transition from analogue to digital has left a large number of people high and dry. Of the 213 radio stations in West Africa who answered this question, 73 stations state that their staff's ability to use ICT is "weak", while 65 stations think that it is "good" and 29.44% say that it is "average" (Graph 18). In Ghana and Senegal, where we find ICTs skills of the staff highest with 59.3% and 50% respectively.

Graph 18: *What is the skill level of staff/presenters using ICT (in general) in the station?*



Overall, training in the use of ICTs is not regularly carried out in radio stations. In fact, 25% of stations in the region confirm that their staff has never had any ICT training. 39.2% think that their staff has had occasional training and only 9% say they have had regular ICT training while others state that they have rarely had any training. It can be deduced from the survey, that half of the presenters and journalists have not had any training within radio stations. It must be recognised that for most stations, staff have trained themselves or benefited from colleagues' computing skills after training, or are self-taught.

This lack of training in the field of ICTs is at the source of journalists' and presenters' problems using the internet and its services efficiently. It also explains the lack of expertise of new technology such as *streaming* and *podcasting*.

An observation often made is that staff in community stations has a much lower level of ICT skills than those in the private or public sector. In fact, for 49.1 % of community stations, staff ICT skills are considered weak while the rate is only 18.6 % for commercial stations.

5.3.2 - The need for strengthening ICT skills of staff

The low level of ICT skills observed in radio stations in the sub-region is the result of a lack of staff training.

Training needs are not given in detail but concern all the different IT fields generally. Digital production is first in the list of demands. In fact, staff would like to get up-to-date training to be able to use the latest equipment installed in stations, in both the control room equipped with new consoles, and in production departments. The need for technical training was also mentioned by a number of stations to ensure the maintenance of equipment, which is subject to use under difficult conditions, particularly in rural areas. *Streaming* techniques, considered a major innovation in the last few years, is also figured among the training needs mentioned.

6 Convergence of ICT and Audiovisual media: new perspectives for radio broadcasting

ICTs have considerably revolutionised the broadcasting sector, in allowing the combination of different types of content (sound, text and images) in a format that can be broadcasted using several supports (computer, television and telephone).

All the actors concerned with the convergence of ICTs and broadcasting have looked again at their organisation and respective services. The telecommunications standard services suppliers are obliged to offer value-added services relying on content such as video or sound. Mobile telephone operators offer images, internet as well as sound. Computers are now used to watch television, listen to the radio and can be used as telephones. Finally, traditional economic models have changed dramatically in recent years. We have witnessed more and more businesses merging that operated previously in different sectors.

In the audiovisual field, radio broadcasting can be considered the sector which has experienced the most impact from ICT development. All broadcasting activities have undergone huge transformations in the technological development of equipment as well as in work practices.

6.1 - Influence of ICTs in the broadcasting value chain

The broadcasting value chain, as it can be presented this way, has the following major activities:

- production of content;
- transfer and distribution of content (communication networks);
- consumption of content (equipment, receiver terminals).

Concerning content production, convergence of ICTs and broadcasting allows a large consumption of content today on several platforms (computer, radio, mobile telephone etc.). This opportunity exists thanks to the standardization of digital content format, of which MP4 is a perfect illustration. This benchmark, considered the most widespread, offers the possibility of dividing capacity storage by 12, which facilitates transfer through networks, reading files adapted to different supports, as well as archiving.

Another significant advance in the making of audio content brought about by ICTs, is the lowering of production costs and reusing audio content, thanks to the use of computers with large storage capacity and free digital editing software that can be used at low cost etc. The actual use of IT in the treatment of documents linked to radio or information research on the internet is a result of sector convergence.

Concerning **transfer and distribution of content**, radio air waves and standard transmitters were the most widespread in use for broadcasting. Today, ICTs have helped technology evolve in allowing an increase in internet network speed (ADSL, Wifi, Wimax …), accompanied by a fall in the cost of access. The innovations brought about by research have also made broadcasting systems evolve to digital with the DAB system **(Digital Audio Broadcasting).**

Box 13:

What is the DAB system (Digital Audio Broadcasting)?

A process of digital compression of sound designed originally for digital radio which will progressively replace FM from around 2010 onward. The advantage of this process is the ability to avoid certain inconveniences that are experienced when using FM: "shadowing" (bad reception in certain regions or on mobile telephones), interference, the high cost of networks. DAB, developed by the European project, Eureka 147 allows the transmission of five (5) mono channels simultaneously.

Cyrille Coutchika Eteka,[25] an expert from the Benin Audiovisual and Communication High Authority (HAAC), affirms that "*Benin has almost 90 FM radio broadcasters and as many transmitters. That makes around 85 pylons installed. If Terrestrial Digital Audio Broadcasting or T-DAB were used, taking into account the current radio coverage zones, that would mean 14 T-DAB transmitters at the most and as many pylons. In the city of Cotonou, there would be only one T-DAB transmitter and only one pylon for ten (10) private commercial FM stations. Each of these stations could even add text and images, and even video sequences to its current programming with quality audio CD sound and all captured on a T-DAB receiver whose price continues to fall. The Beninese government could gain a lot of frequencies because these limited resources are becoming even rarer all over the country".*

25. Cyrille Coutchika Eteka *"Radiodiffusion numérique terrestre et l'Afrique : la révolution technologique de l'espoir"* (Terrestial digital broadcasting and Africa: the technological revolution of hope') - **www.cyrileteka.org**

To ensure the transfer of radio signals, satellites are still very much in use despite the high costs involved. The internet/satellite linking has become a solution in ensuring maximum coverage across territories, in particular by radio stations divided across several countries, as in the case of West Africa Democracy Radio.

As for the distribution of digital content, the convergence of ICTs and broadcasting has resulted in innovations in copyright management with the DRM solution (*Digital Right Management*) which allows content to be safeguarded from its production to its final restitution. Adopting this new technology allows content to be distributed en masse in complete security with the possibility of offering listeners products on demand. It must be pointed out, however, that the strict application of DRM could be an obstacle to the dissemination of culture and knowledge and act as a brake on innovation, especially in less developed countries.

Concerning content consumption, the rapid development of ICTs has considerably changed habits beginning with receiver equipment. Mobility and personalisation have become important criteria of choice in acquiring new radio receiver equipment. Multimedia computers are delivered with a FM card as standard, and radio is now integrated into mobile equipment (telephones - MP3 readers - recorders - TVs - USB keys).

One of the first functions affected by ICT development has been storage. The cost of storage capacity is currently following an exponential declining curve. Recording and archiving several hours of radio programmes is no longer a problem for stations equipped with large capacity hard disk acquired at a reasonable cost. Apart from receiving radio programmes, ICTs have also brought more interaction between listeners and journalists and presenters, thanks to the use of mobile telephones, SMS and vocal servers.

The use of digital radio stations such as Worldspace, also opens access to a diversity of stations and radio productions with remarkable research and listening quality. Thanks to streaming, today it is even possible to follow radio programmes live, whether it is an actual radio station that is also broadcasting by streaming or a web-radio only broadcasting on-line.

Box 14:

Regulation bodies faced with convergence

"In Niger, the current challenge of convergence is both political and institutional. The debate has resurfaced with renewed vigour since 12 March 2008, when the CSC (the Authority for Communication), a media regulation body, decided to suspend FM broadcasting of RFI (Radio France International) for three (3) months. The decision was not followed through as RFI does not simply broadcast in FM; it also transmits its programmes from satellite dishes and television digital clusters. Without taking into account the fact that RFI can also be listened to on its website. As a result, CSC's decision was only partially followed through. Faced with this, the CSC is currently in the midst of introducing a bill to attribute itself the role of regulating telecommunications, which currently belongs with ARM (in charge of the regulation of telecon). They argue that the CSC is not competent to regulate telecommunications. The debate is thus open again." (Abdourahamane Ousmane - Extract from a survey report in Niger.)

See Section 4.7 above, for the approach adopted in Benin.

6.2 - Innovation in creating new radio receiver equipment

The resources dedicated to research on broadcasting techniques and receiving video and audio data have resulted in satisfactory results in the broadcasting world. One of the results from this research is the invention of **FM/Wifi radio receivers.**

With the development of on-line radio stations, several manufacturers have launched FM radio receivers on the market which allows on-line radio stations to be listened to on the internet (*streaming*). With a standard FM antenna and connected to the Internet by cable or Wifi, these radios are compatible with all audio format and support internet streaming received. The price of these FM/Wifi receivers varies between 100 and 200 Euros.

The first advantage of this technology is that web radio can be listened to without a computer from now on, and from a standard transistor radio. The other advantage that this innovation offers is that the restrictions on radio frequencies are no longer an obstacle for radio broadcasting on a given territory.

The French telecommunications operator, Orange has already put its FM/Wifi radio receiver called *Orange LiveRadio*,[26] on the market, which offers internet listeners the possibility of configuring radio addresses in *streaming*, and to listen to them in complete freedom, from wherever the radio station broadcasts.

26. http://www.orange.fr/bin/frame.cgi?u=http%3A//liveradio.orange.fr/

The supplier, Terratec has also launched its FM/Wifi radio receiver called *Noxon iRadio Terratec*[27] which overall has the same functionalities as Orange's *LiveRadio*.

An NPM (non-profit making organisation) named *Afritude Europa,* based in Belgium has got involved in the development of innovative solutions in broadcasting and radio reception for existing radio stations on the internet, not just in Africa, but also in Europe. Created by Africans in Belgium, this organisation is fighting against the pernicious effects of illegal immigration in Europe, the rural exodus in Africa, the brain-drain and lack of schooling for children. Thanks to European Union financial support, *Afritude Europa* has developed a radio programme receiver "suitcase" available on the internet which they have very kindly made available to African nationals living in Europe (See the following box).

Box 15:

AFRITUDE TECHNOLOGY INVENTS THE DIASPORADIO & TV SUITCASE

The DIASPORADIO suitcase was designed by our team to allow you to listen to all existing radio stations on the net in real time, and from anywhere in the world. What is even more fun is that you don't need a computer.

The DIASPORADIO suitcase is designed ergonomically to offer you impeccable listening of up to 320 kbps.

The DIASPORADIO suitcase is already configured before its arrival, so there is no installation or configuration to do; all you need to do is to just plug it into your internet network (RJ45) or fixed line (RJ11) and it's ready. You'll automatically get your favourite radio station.

You can go anywhere you want, from the office to your home, your bedroom or even a hotel.

How to get your DIASPORADIO suitcase delivered?

It is totally free for all nationals of East and West Africa living in Europe legally.

AFRITUDE EUROPA
Rue Chausteur 30/12 6042 (Lodelinsart) CHARLEROI Belgium
http://www.diasporadio.info / http://www.afritude.org

27. http://www.terratec.net/en/products/home-entertainment.html

6.3 - The contribution of regional and international programmes

Regional initiatives and projects underway should be able to satisfy the very large connectivity needs in West Africa, especially in Mali, Sierra Leone and Niger.

6.3.1. - SAT3/WASC/SAFE

The submarine cable system **SAT3/WASC/SAFE** which links Europe, Africa and Asia with a total capacity of 120 Gbps represents an opportunity, for a digital opening up in the region and all over the continent.

The major objectives of this high-tech project are to connect Africa to the world network, to develop basic telephone services, broadband and multimedia services such as the internet, tele-services etc.

Unfortunately, Sahel African countries were not taken into account in the first architecture which concerned other African coastal countries. Today, even if communication costs have not seen the fall anticipated, and the use of cable has not exceeded 5%, as shown by Eric Osiakwan, executive secretary of AfrISPA (African Internet Service Providers Association), in a paper entitled *"The Impact of Fibre Optic Links on Mobile"* presented in Cairo, May 2008, the countries which have benefited from this, offer the most competitive costs and the greatest capacity even so.

In order to overcome this situation, BOAD (West African Bank of Development), BAD (Banque Africaine de Développement) and other multilateral donor-funders have launched a policy of giving large-scale loans to construct optic fibre connection infrastructures in West Africa. The fibre link will then continue throughout African countries, including Côte d'Ivoire, Togo, Mali, Ghana, Benin and Niger.

6.3.2. - RASCOM

The pan-African **RASCOM** satellite initiative should, according to RASCOM, facilitate satellite transmissions between African countries and the rest of the world at a low cost since it is, in part, the product of African public contributions.

RASCOM's mission is to conceive, implement, exploit and look after the space sector of the satellite telecommunication system in Africa, and transform all the possibilities offered by satellites in joining them if necessary, with any other appropriate technology into services and tools for African integration.

The creation of RASCOM should allow the following objectives[28] to be achieved:

- Provide large-scale telecommunications infrastructure at low cost to rural areas on the continent, using appropriate technology;
- Improve and/or develop interurban communications in every country;
- Establish direct lines between all African countries without exception;
- Provide facilities for radio and television programmes in every country and allow the exchange of radio and television programmes between African countries;
- Support international connectivity: pursue the connection wherever others cannot go;
- Provide a range of services: voice, data, multimedia, tele-education, tele-medecine, video conferencing etc.

The first Spacebus satellite of the fleet was launched by an Ariane 5 rocket from the space centre Kourou in December 2007. It was to offer coverage across the African continent, a part of South Europe and a part of the Middle East. Its mission: to provide television and telephony services, data transfer, internet connection and C- and Ku-Band VSAT. Following its launch on 22 December 2007, technical problems prevented it entering orbit. On 8 January 2008 the satellite manufacturer attempted to relaunch the satellite, which finally succeeded but its lifespan was reduced to two (2) years instead of fifteen (15).

6.3.3. - The CMC Project (Community Multimedia Centres)

In another field, the **Community Multimedia Centres (CMC)** project should be examined. It is an UNESCO initiative which aims to reduce the digital gap in the most impoverished communities in developing or transition countries. It is a pooling of resources for a community radio station and community telecentre, which have all the infrastructure needed for connection to the internet and basic communication equipment (telephone, fax, computer …).

In Africa, three countries are involved in the CMC scale-up initiative: Mali, Mozambique and Senegal. The initiative was launched in Geneva in 2003, during the World Information Society Summit, in the presence of. Koïchiro Matsuura, General Director of UNESCO, Walter Fust, General Director, SDC, President Amadou Toumani Toure (Mali), President Joaquim Chissano (Mozambique) and President Abdoulaye Wade (Senegal).

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28. http://www.rascom.org/francais_index.html

Today, Senegal has 24 CMC, while Mali has 23 and Mozambique 20. This programme is continuing, and expects in its second phase to consolidate and strengthen the centres already in operation. The impact of this project in updating technology in radio stations involved is significant, as the co-ordinator of the CMC Project, Ousmane Bamba in Mali underlines: "*the establishment of CMC in Mali has considerably increased the connectivity rate of radio stations to the Internet, in particular that of community radio stations which are generally in areas devoid of any technological infrastructure".*

Table of 23 UNESCO CMC financed by the *Coopération Suisse* in Mali

Project phase	Name of CMC frequency	Radio	Town	Region	Distance from Bamako
Pilot phase	CMC Radio Rurale de Kayes	89.10 MHz	Kayes	Kayes	590 km
	CMC Jamana	102.6 MHz	Koutiala	Sikasso	400 km
	CMC Cèsiri	89.00 MHz	Niono	Ségou	339 km
Scale-up phase	CMC Yeliméné	102,2	Yeliméné	Kayes	
	CMC Bambouck	99.9 MHz	Sadiola	Kayes	630 km
	CMC Jamana	97.3 MHz	Dièma	Kayes	590 km
	CMC Faso Kanu	107.5 MHz	Banamba	Koulikoro	140 km
	CMC Baguinéda	105.4 MHz	Baguinéda	Koulikoro	30 km
	CMC Teriya	94.6 MHz	Nièna	Sikasso	300 km
	CMC Wassoulou	95.1 MHz	Yanfolila	Sikasso	250 km
	CMC Benso	93.7 MHz	Kolondièba	Sikasso	200 km
	CMC Sanké		San	Ségou	434 km
	CMC Soumpou	92.0 MHz	Baraouéli	Ségou	185 km
	CMC Bendougu	104.1 MHz	Bla	Ségou	329 km
	CMC Loola Mayo	99.9 MHz,	Diafarabé	Mopti	460 km
	CMC Orana	93.2 MHz	Koro	Mopti	735 km
	CMC Les échos de la falaise	95.2 MHz	Sangha	Mopti	742 km
	CMC ADAAR Koukia	107.8 MHz	Ansongo	Gao	1290 km
	CMC La voix de l'Azawagh	100.0 MHz	Ménaka	Gao	1500 km
	CMC Guimba Bodo	97.10 MHz	Goundam	Timbuktu	1130 km
	CMC Alkhabar	103.1 MHz	Rharouss	Timbuktu	1180km
	CMC Koolol Sobundu	103.9 MHz	Niafunké	Timbuktu	1230 km
	CMC Tarawanté	91.00 MHz	Tessalit	Kidal	1800 km

6.3.4. Other projects

- The RURANET/CID project

The African Centre of Meteorological Applications for Development was the first to introduce the concept of community radio in Africa. From the start, the idea was integrative: it was about broadcasting meteorological information combining several technologies: satellite, internet, FM radio and renewable energies, mainly solar and wind.

"The concept was put into place in Niger in 1999 with considerable support from UNDP and the Dutch NGO called SNV, under the name of RURANET/CID. CID (Centres of Information for Development) are given devices for broadcasting information by radio, designed to take place in resource centres for community development."[29]

According to the official project document, its objective is "to help the most impoverished and remote rural communities in Niger in the fight against poverty and exclusion, strengthening their capacity to access and use management methods and appropriate technologies for communication and the exchange of information for sustainable development. In the long term, this initiative will contribute to creating a market base in terms of entrepreneurial human capacity and techniques for the progressive emergence of private sector assistance and support in its associative and community approach."

Under the aegis of a steering committee of community radio stations, RURANET/CID has as its operational objective to install one hundred and sixty (160) self-managed community radio stations, with twenty (20) in each region. As a result, 103 community radio stations were set up all over Niger.

- "Revitalizing rural radio stations in Niger"

Is physical networking of rural radio stations in Niger and their connection to the internet possible? This question neatly sums up the difficulties linked to the implementation of a project of relaunching rural radio stations, initiated by the Nigerien government with FAO and UNICEF support.[30] Among the eight (8) activities programmed in this project, two (2) are directly linked to radio station networking: (1) the physical networking of around twenty radio (21) stations and

29. Source: Base-line study on universal access in Niger, Page 113
30. Project TCP/NER/2903

the creation of a network of rural radio stations; (2) linking rural radio to the internet. Faced with the difficulties encountered, the project has decided to proceed in stages: first, networking of rural radio stations; then connecting radio stations to the internet.

Box 16:

Two initiatives to face convergence by radios in Sierra Leone

a) **Talking Drum studio (TDS-SL)** has been principally involved in training, programming, advocacy, institutional capacity-building through the provision of funds, and provision of equipment for the running of community media. TDS-SL has been at the forefront of media initiatives that aim at improving communication. Their public sensitization and educational programmes are designed to promote a culture of peaceful resolution to conflict and are broadcasted by radios across the country. Their programmes are produced using digital equipment and distributed via cassettes and CDs to various radio stations for broadcast. Since 2000 when Talking Drum Studio was established there has being an improvement in production quality and programming. They have had an overall program for training producers of radio stations. According to TDS, 24 Radio broadcast Producers have being trained using digital equipment and Open Source software.

b) *Initiative for mobile training of community radios* **(INFORMOTRAC)** is a Radio Netherlands project in Sierra Leone and has as an objective to train community radio broadcasters in digital and analogue productions. They also donate a complete package of professional radio broadcast equipments as a follow-up support to the radio stations they train. Since 2004 when INFORMOTRAC was established, several radio stations have benefited from digital broadcast equipment and training.

7

Recommendations

These recommendations have been drawn up for the attention of all those concerned by development in the media and ICT sector, nationally, regionally and internationally. In particular governments, professionals in the media sector, media support organisations, regional organisations such as ECOWAS and development partners.

7.1. - Strengthening of human resources capacity

With the rapid evolution of technologies, regular updating of skills is indispensable. Taking into account the lack of ICTs capacity shown by the survey results, a great deal of effort needs to be deployed to improve staff skills in radio stations. The recommendations are listed as follows:

1. Strengthen radio capacity in terms of the appropriation of the challenges posed by ICTs;
2. Support radio stations to define suitable ICT internal policies short, medium and long-term;
3. Strengthen radio capacity in terms of the use of internet and related applications;
4. Consolidate staff training in radio stations in audio-digital production;
5. Train radio staff in the creation and management of websites, in *streaming* and *podcasting* in order to make them operational and autonomous;
6. Promote the use of free software useful for the functioning of the radio station and training staff in its use, in particular in editing;
7. Strengthen the integration of ICT in the training of radio journalists and presenters, in structures and mechanisms of theoretical and alternative training (open-learning, training by non-profit making organisations and radio station networks etc.);
8. Encourage radio stations to put in place ICT user networks to exchange experience and strengthen knowledge and understanding.

7.2. - The political and institutional environment

Generally speaking convergence between the media and ICTs has an effect on the media environment. All of the actors involved are concerned by rapid transformations; the State in its role as guarantor of public service and well-being of its people, regulation authorities responsible for managing an ethical, technical and

economic balance, as well as the operators responsible for providing services and users. The following recommendations particularly concern states and regional public institutions:

1. Put in place specific national and regional strategies dedicated to the recognition of new technologies in radio and the media in general, involving all stakeholders;
2. Strengthen and extend the mechanisms of direct and indirect aid to benefit radio stations, taking into account the need for ICTs which require considerable resources;
3. Reduce taxes on computing equipment to encourage their acquisition by the media, and radio stations;
4. Finance modern digital equipment in media training institutions and the training of trainers in new technologies;
5. Facilitate negotiations among telecommunications operators to reduce the cost of ICT access to stations, in particular community stations;
6. Encourage the recognition of convergence among media regulation bodies, by creating collaboration mechanisms between media and telecommunications regulators, or creating a single converged regulation body.

7.3. - Technological upgrading

The transition from analogue to digital necessitates considerable investment in equipment. New technological discoveries are, however, less costly and offer greater possibilities. The following recommendations on this point are for the attention of different actors:

1. Put in place an action in different countries for a better understanding and awareness of the national and international challenges of digital radio;
2. Put in place national and regional policies on the migration to digital, involving all stakeholders, with recognition of the international calendar fixed by the ITU (International Telecommunications Union);[31]
3. Support the implementation of programmes of equipping community radio stations or radio stations in disadvantaged areas with digital equipment: computers, CD/DVD, USB keys, recording-playing equipment;
4. Support new equipment (FM/WIFI radio receivers, satellite radio receivers etc.) to increase audience numbers and extend coverage range;

31. Regarding digital migration, South Africa is the most advanced country in strategies put into place in Africa, in particular for television. See **www.digitalmigration.gov.za**
See also on ITU's website the press statement *"Digital broadcasting set to transform communication landscape by 2015"* **http://www.itu.int/newsroom/press_releases/2006/11.html**

7.4. - Linking with regional and international projects

In the struggle to bridge the digital divide, the contribution of regional projects is important. In fact, the necessary infrastructure to ensure global connectivity in Africa can only be brought about by regional-wide projects, whose effects are worth sharing with all actors. The recommendations connected to these projects are the following:

1. Facilitate exchange between radio operators and RASCOM management, in a SAT3 sub-marine cable network and other interconnection projects, in order to make public the advantages from which radio stations can benefit etc.;
2. Keep management in radio stations informed of the opportunities of ICT and national, regional and international initiatives linking ICTs and radio stations.

7.5. - Access to digital networks and uses

Connectivity is the first step in accessing knowledge and available resources in the worldwide network. The uses that actors make of ICTs in radio stations should be identified and shared. Recommendations concerning access to networks and its uses are summed up as follows:

1. Develop connectivity in countries by increasing bandwidth, consolidating infrastructure, extending coverage of telephone networks and lowering the cost of access;
2. Improve radio connectivity to the internet through partnership between internet access suppliers and radio stations;
3. Make new connection services to the internet available via the mobile phone;
4. Strengthen radio station capacity in terms of reception and broadcasting by satellite;
5. Make innovative usage of ICTs in radio stations accessible and promote an exchange of experience in terms of ICTs use;
6. Create a web portal of information and exchange of audio content, if possible through podcasts and streaming;
7. Encourage putting servers into place which can host radio stations websites with streaming at a relatively affordable cost;
8. Encourage the presence of audio content in West African languages on the internet;
9. Encourage establishing digital archiving systems to preserve audio work with strong cultural content.

Conclusion

The radio landscape in West Africa is rich and varied overall. There are more than 900 radio stations today that transmit in the seven (7) countries involved in this study. These radio stations have not experienced the effects of the digital revolution at the same speed as radio stations in countries in the North. The study revealed an average connectivity rate among these stations with a large disparity depending on the country and type of radio station. Indeed, the level of access to digital networks depends on existing telecommunications infrastructure in countries and local economic conditions. The gap, in terms of basic communication services, is noticeable between Senegal, on the one hand where there is a fast internet connection available at low cost, and on the other hand, Niger or Sierra Leone where the connection is slow and expensive.

The digital divide is also apparent between commercial and community radio stations that generally have limited financial and technical resources. They are also mainly present in rural areas and are not well connected.

As for innovative usage, linking ICTs and radio stations, this appears rather limited. The limations are often due to the lack of awareness of the possibilities offered by ICTs as well as a skill gap in the staff able to deliver expected services. The mobile phone, easy to access and benefiting from rapid development of the network is considered an essential tool in reporting by journalists, and is used while in interaction between listeners and radio presenters. In order to better communicate with listeners, radio stations also rely on services linked to the mobile phone e.g. SMS, which has been enormously successful with people.

Today, research and development have allowed multi-use digital equipment to be built to watch television, listen to radio, telephone, but also to save data. This equipment available on the market and at low cost, offers many possibilities for radio stations. The latest technological developments revealed offer FM/WIFI receivers allowing FM radio stations to be listened to, as well as those stations available on the internet.

These innovations call into question all regulation limiting broadcasting in territorial terms and the need to have broadcasting frequency to be able to broadcast a radio station on a given territory.

The ideal solution for broadcasting a radio signal across large territories remains satellite. This is only used in countries in the sub-region by public radio stations that are funded by public money, for the cost still remains very high.

In the meantime, fibre optic has been tried out by some countries through the SAT3/SAFE project and is being implemented to cover the Sahel countries and ensure their high-speed connection to world networks, in particular for Mali, Ghana, Benin and Niger.

All of these technological advances can be exploited by radio stations on the condition that staff are trained and made aware of the challenges posed by the convergence of ICTs and radio broadcasting, but also by the sharing and exchange of information on the opportunities that these technologies offer for improved performance in the course of their work. The radio and media sector remain confronted by the challenges of convergence, and in particular, that of migration towards the digital. International discussions and decisions, calling for a move to digital before 2015, should be taken into account by countries in the region.

PIWA aims to continue analysing and monitoring these matters to support the radio and media sector's development. Hence, a new study is envisaged in the next two (2) years, especially in the light of the current study's results. Other countries will be covered and other kinds of action will continue to be implemented.

APPENDICES

Appendix 1:

More ICT use forms and interviews

Niger

Fiche d'usage des TIC dans la radio communautaire Alternative	
Usage	L'utilisation des TIC dans la radio permet de représenter mieux le Niger et les Nigériens sur Internet. Cela a permis à la radio d'éditer des textes en ligne, de proposer des podcasts, etc., et de démontrer ainsi le sérieux du projet. L'usage des TIC permet à la radio de diffuser de l'information dans le monde entier et de se doter d'une carte de visite électronique lui permettant d'augmenter sa crédibilité.
Activités	- Formation à l'installation de plate-formes Wordpress sur le serveur de la radio Alternative - Construction, à partir d'un modèle prédéfini, d'un site fait sur mesure à travers la modification des codes HTML et CSS permettant de définir un aspect visuel intéressant et d'y éditer images et photographies. - Installation de lecteurs audio insérés dans le code HTML pour permettre la diffusion de choix musicaux ou d'extraits d'émissions radios préenregistrées - Administration générale du site et alimentation du site avec des contenus multimédia : articles journalistiques en ligne, intégration de photos à travers un compte photo **(www.photobucket.com)**, intégration de vidéos en ligne **(www.youtube.com)**. - Création de plusieurs blogs (peintres, ONG, journalistes, écrivains, photographes) avec l'appui de partenaires sur les questions d'administration, édition de texte, résolution de problèmes de formatage, utilisation d'un compte de photos en ligne, édition de photos, etc.

Aspects techniques	Alternative Espaces Citoyens a reçu l'appui d'Alternative Canada (mise à disposition d'un stagiaire) pour la mise en oeuvre d'un projet sur les blogs pendant 4 mois. - La plateforme utilisée est celle du logiciel Wordpress **(www.wordpress.com)**. - Podcasts, compte vidéos, pour éviter de surcharger le serveur et de réduire la vitesse de la connexion déjà lente.
Principaux acteurs	- Stagiaire Alternative Niger - Alternative Canada. - Régisseur de la Radio Alternative. - Monteur son, Radio Alternative. - Agent de maintenance équipement informatique/réseau, Radio Alternative
Résultats obtenus	- Construction d'un espace populaire d'expression, facilement utilisable et permettant la diffusion de contenus sur le World Wide Web. - Meilleure interactivité et plus grande réciprocité permettant aux lecteurs de faire part de leurs opinions. - Diffusion des langues nigériennes. Par exemple le site **www.alternative.ne/inamafita** («S'en sortir» en hausa) ayant pour objectif la diffusion de l'écriture au Niger en langues nationales a fait l'objet, une semaine après sa mise en ligne, de commentaires montrant ainsi l'intérêt pour la diffusion de langues nigériennes sur Internet. - Diffusion de contenus journalistiques écrits et audio. - Attrait renouvelé auprès de jeunes générations pour les TIC. - Utilisation des sites et blogs comme cartes de visites utiles pour lever des fonds.
Contraintes	Les contraintes ont été d'ordre technique, financier, et au niveau de la formation.

Perspectives	- Permettre une meilleure visibilité sur Internet des contenus nigériens. - Créer des cartes de visite pour des organisations ou des individus. - Faire profiter des TIC associations et individus et les leur faire utiliser - Promouvoir la culture du Niger sur la scène internationale : artistes, écrivains, peintres, etc.
Partenaires et financement	ACDI (Programme Cyberjeunes), Alternative Canada (Montréal).
Contacts	Xavier Leroux : **bakounine2000@yahoo.com** Zakary Maina Amadou : **coeurdemaina@yahoo.fr** Abdoulaye Adamou Mato : **maestro_abdoul@yahoo.fr** Ibrahim AbouBakr : **ibraline@hotmail.fr** Moussa Tchangari (Directeur Groupe Alternative) : **tchangari@yahoo.fr** Francois Coulombe (Projets Afrique, Alternative Canada) : **fcoulombe@alternatives.ca**

Ghana

Interview with Mr Frank AGYEKUM, Deputy Minister of Information and Mr Mawutodzi ABISSATH, Assistant Director for ICT at the Ministry of Information

(report by Kwami Ahiabenu II)

Ghana does not have an ICT strategy policy for the radio or media though there is a general ICT policy for the country but not for the media exclusively.

Secondly there is no national or international ICT program for the media or radio. In addition, the state in some cases provides funding or indirect assistance for the media especially for state owned media. In this direction, the Ministry of Information prepares a national budget every year for the state owned media and present it to Parliament for approval.

They mentioned that the Ministry of Communication and Ministry of Information are responsible for ICT and media respectively. Both Ministries work hand in hand in the area of the media and ICT. The Ministry of Communication is responsible for infrastructural development of ICT in the country and the Ministry of Information is in charge of the content development of ICT.

According to the deputy minister, there have been two projects launched by the Ministry of Commu-nication entitled the National Backbone Programme and E-Ghana, implemented by the government for the promotion and development of connectivity to the internet in the country. The projects were created to inform communities about the use of internet and ICT, as well as how to seek information on the internet. Putting Ghana on the Information highway is a major project for the nation.

Historically, the Ministry of Information had the right to intervene in the use of SMS and phone calls in the media but that right has been taken from them. The National Media Commission is in charge of that now and they do intervene in interactive programs on radio sometimes. The Ministry of Information and Communication is in constant dialogue on ways to regulate ICT use in the country.

Currently the two ministries are in the process of planning the implementation of a Community Information Centre in all the District capitals in the country so that citizens of all the Districts in the country will know about their communities and even that of others.

For information on the national policy on ICT and media in Ghana log on to **www.ghana.gov.gh**

Ghana

Interview with Bright BLEWU,
General Secretary of the Ghana Journalists' Association (GJA)
(by Kwami Ahiabenu II)

Does the country have an ICT strategy or policy? What is the place of radios in this strategy (as stakeholders)?

There is an ICT policy for Ghana and the media has a role in this policy as an important stakeholder.

Does the country have a national or international ICT program implying the actors of media, in particular the radios? (List the programs with their objectives and targets)

NO programs

Is the authority of the media the same as that of ICT? (Relation between the two authorities)

The Ministry of Communications is responsible for ICT and the Ministry of Information is responsible for Information. Though the two ministers are separate, they both work together through inter-sectorial co-operation.

Does a strategy of development/promotion of the radios exist? (Effectively, implementation, results)

There is no direct strategy, but the national constitution has a strong place for the media and there is no impediment to the work of the media in Ghana. More importantly there is no censorship in Ghana, so the media in Ghana works freely. There is no broadcasting law in Ghana but work is in progress to develop a broadcasting law for the country.

Do you have projects for the development of connectivity to the Internet in the country? (Details)

There is a project to connect the whole country by fibre thereby creating a national backbone for the country.

Does the regulator prohibit the use of SMS and phone calls to the media, specifically to the radio (interactive program)?

There is no policy in this area and nothing bars the stations from using SMS and phone calls in their programming. It would be a violation of the media's rights and freedom of expression, if an attempt is made to intervene in the use of SMS and phones call.

Is there dialogue or harmonization between the regulators of ICT/Telecom and the Media?

The National Communication Authority (NCA) regulates the radio stations in terms of their licensing obligations, for example, it can call to book a station which is using a powerful transmitter than its license permits. Generally the media is guided by the constitution and conforms to the rights and privileges. In terms of the media, there is a role for the National Media Commission.

Benin

Cyrille ETEKA,
Ingénieur de conception en télécommunication, spécialiste en radio et télévision.
Haute Autorité de l'Audiovisuel et de la Communication.

« Les textes actuellement en vigueur ne permettent pas de passer de l'analogie au numérique. »

Avez-vous connaissance de la politique et stratégie TIC au Bénin ?

J'ai entendu parler d'une politique des NTIC lors du second quinquennat (2001- 2006) de l'ancien président Kérékou. Mais je n'ai jamais vu le document en tant que tel et je ne maîtrise pas son contenu.

Mais depuis 2006, il existe un nouveau document appelé Plan TIC Bénin ?

Je n'ai pas connaissance de ce nouveau document de politique et de stratégie TIC.

Avez-vous l'impression que l'ancien document accordait une place à l'audiovisuel ?

Il me semble que c'est seulement la question de la couverture nationale en radio et en télévision qui a été abordée dans ledit document. On n'y retrouve pas une vision clairement exprimée à ce sujet. Il ne précise pas, par exemple, si cette couverture en radio télévision du territoire national va se faire en numérique ou en analogique.

A la rentrée télévisuelle 2008, le Ministre de la communication a fait savoir qu'il existe un fond de plus de 17 milliards pour ce projet de couverture nationale.

J'étais heureux de l'apprendre. Mais ma déception était aussi grande quand je me suis rendu compte que cette couverture va se faire en analogique. Je me suis dit que c'est un gaspillage. Car dans les conventions régionales internationales récentes, surtout celle qui s'est tenue en 2006, il est dit clairement que dès 2015, on ne parlera plus de la télévision analogique en bande UHF.

En est-il de même pour les radios sonores ?

Non ! Les radios peuvent continuer d'émettre en bande FM. Mais il faut savoir qu'il existe également la radio numérique terrestre.

Seules donc les télévisions sont concernées par l'échéance de 2015…

Oui. On ne peut plus parler de télévision analogique en bande UHF, bande 4, bande 5… sur lesquelles émettent les télévisions privées béninoises. A l'heure actuelle, on ne peut investir 17 milliard dans une technologie obsolète. Il faut comprendre une fois pour de bon que la télévision analogique est finie.

Comment expliquer ce projet de couverture télévisuelle nationale en analogique ?
Peut-être par manque de volonté. Car, même en l'absence d'expertise locale dans le domaine, on peut faire appel à l'expertise internationale. Ou alors, il existe des raisons qui justifient ce choix de l'analogique que je ne maîtrise pas personnellement.

En ce qui concerne les radios sonores, est-ce qu'il y a une date butoir pour passer de l'analogie au numérique ?
En radio, il n'y a pas une contrainte de date comme c'est le cas pour les télévisions. Les radios peuvent continuer d'émettre jusqu'à ce que le monde entier décide de les faire disparaître comme on est en train de le faire pour les télévisions.

Qu'est-ce que la radio numérique ?
Avec la radio numérique, on n'utilisera plus les postes récepteurs classiques ou ordinaires qu'on retrouve actuellement sur le marché. Les stations radios qui émettent en bande FM doivent pouvoir migrer vers la bande 3 qu'utilise par exemple la télévision. Cela entraine pour les promoteurs de radios, de changer les émetteurs en vue d'être conformes aux normes définies et adoptées. La radio numérique présente aussi des avantages pour les promoteurs de radios qui ne peuvent diffuser, selon la norme actuelle qui tend vers l'obsolescence, que six à neuf programmes. La nouvelle norme utilisée dans le monde permet quant à elle d'aller jusqu'à 24 radios.

Les textes juridiques qui existent aujourd'hui permettent-ils de passer de l'analogique au numérique ?
Les textes actuellement en vigueur ne permettent pas de passer de l'analogique au numérique.

Alors, que faire ?
Comme il s'agit d'un traité international, le Bénin doit d'abord le ratifier et prendre ensuite des textes juridiques pour organiser le secteur et permettre aux radiodiffuseurs, aux consommateurs et tous les acteurs du secteur de mieux s'approprier cette technologie.

Existe-t-il au Bénin des programmes des TIC ou de grande envergure qui impliquent les acteurs de l'audiovisuel, surtout ceux de la radio ?
A ma connaissance, je n'en connais pas.

Radio, informatique et télécommunication : quelle lecture faites-vous de cette trilogie ?
Aujourd'hui, on ne plus parler des radios sans parler de télécommunication et d'informatique. C'est ce qu'on appelle la convergence numérique et les trois vont de pair. Si une autorité parle de l'audiovisuel en ignorant les télécommunications et l'informatique, c'est qu'elle est en déphasage de l'actualité technologique.

La Haac qui a la charge de la régulation des médias arrive-t-elle à réguler les émissions interactives par SMS ou par appel téléphonique ?

Les conseillers de la Haac sont plus habilités à répondre à cette question. Cependant, la Haac peut réguler les textes SMS qui s'affichent sur les écrans de télévision. Mais il sera difficile de contrôler tout ce qui se passe dans l'ombre.

Vous opérez souvent des contrôles lors des installations des radios. S'approprient-elles les TIC déjà à cette phase d'installation ?

Au niveau des radios privées, les régies sont de plus en plus informatisées. Vous y trouvez un ou des ordinateurs qui gèrent toutes les émissions. Ils servent aussi à stocker les palettes de musique. Parfois même, des émissions entières préenregistrées sont stockées et sont par la suite diffusées. Ils servent aussi à faire des montages, alors qu'entre temps c'était des montages mécaniques plus difficiles à gérer.

Y a-t-il souvent collaboration entre le Ministère de la communication et la Haac en matière de gestion des TIC ?

Les autorités de la Haac peuvent répondre. Mais à ma connaissance, il n'y a rien de cela. Tout ce qui se fait dans ce domaine se fait de façon unilatérale. Les gens n'ont pas encore compris que les TIC sont au-delà de l'internet, qui n'est qu'un maillon des TIC. Les TIC concernent tous les secteurs de la communication en commençant par la téléphonie, l'informatique, l'audiovisuel… Aujourd'hui, le réseau électrique qu'on utilise pour acheminer du courant peut offrir de l'internet à haut débit.

La Haac et l'Autorité transitoire de régulation des postes et télécommunications (ARTPT) se concertent-elles ?

C'est encore les conseillers de la Haac qui peuvent répondre. En tant que technicien de la HAAC, je ne le sens pas. L'ARTPT s'occupe de la téléphonie alors que nous tendons vers la convergence institutionnelle. Celui qui se cantonne à la régulation de la téléphonie ne peut pas ignorer la régulation de contenu. L'audiovisuel, l'informatique et la communication vont de pair.

Que pensez-vous de l'usage des téléphones portables pour faire des reportages dans les stations radios ?

C'est normal et on ne plus s'en passer, le monde évolue, on n'arrête pas le progrès. Le monde évolue et nous devons aller avec ce monde.

Que vous inspire le clivage technologique qui s'observe dans l'audiovisuel ?

Mon souhait est que l'on dépasse ce clivage technologique. Nous devons aller dans la convergence, c'est à prendre ou à laisser. Le Bénin doit aller de façon résolue dans la promotion des TIC. Il n'y a pas développement en ignorant ce secteur ou en le réduisant uniquement à l'internet.

Propos recueillis par Hippolyte DJIWAN

Benin

Mme Nelly KWENDE,
Directrice générale des Technologies de l'information et de la communication (DG/TIC)

Le Bénin dispose t-il d'une stratégie ou d'une politique dans le domaine des TIC ?

Oui ! Le Bénin dispose d'une stratégie, le Plan TIC-Bénin, adopté en août 2006 qui est la feuille de route du gouvernement en matière des TIC et de télécommunications. Ce document donne l'objectif et la vision du gouvernement pour les TIC. Cette vision est de faire du Bénin le quartier numérique de l'Afrique.

Le Plan-TIC vient-il remplacer le document de politique TIC adopté en 2003 ?

Il n'est pas question de remplacement. Le Plan-TIC vient améliorer celui de politique et de stratégie des TIC qui date de 2003. C'est un document qui n'a pas été réellement mis en œuvre. Par contre, la feuille de route du gouvernement en matière des TIC met en place les grandes lignes. Toutes les réformes entreprises ces derniers temps dans le secteur des GSM par exemple se retrouvent dans cette feuille de route. Il en est de même pour le plan de redressement de Bénin Télécoms et de la mise en place de l'Autorité de régulation transitoire des télécommunications. Cependant, il faut, à partir de cette feuille de route, faire des documents de politique et de stratégie. Ce qui est cours actuellement. Ce sera un document léger, décliné de manière sectorielle, car les TIC sont un domaine transversal. Nous ne voulons pas prendre le risque de faire un document qui ne sera pas mise en œuvre comme l'ancien.

Quelle est la place de l'audiovisuelle dans le Plan-TIC ?

La réalité, c'est qu'on s'est focalisé sur les TIC, tout en sachant que la convergence nous appelle à nous intéresser aux radios et aux télévisions. Cependant, la question des TIC et des médias est du ressort de la Direction générale du développement des médias qui s'occupe justement des télévisions et des radios, car dans le ministère, il y a trois grandes directions générales.

Existe t-il des programmes TIC d'envergure nationale ou internationale impliquant les acteurs de l'audiovisuel, en particulier les radios ?

Dans le domaine des TIC, il n'y a pas de programme spécifique destiné cette année à l'audiovisuel. Cependant, il est prévu dans la deuxième moitié de cette année un atelier de formation des journalistes en matière des TIC, pour qu'ils sachent comment faire des recherches. Mais au-delà, il y a un programme de e-gouvernement qui ne fait pas une place spécifique pour l'audiovisuel. Mais l'audiovisuel sera associée

à certains endroits de l'exécution du projet pour mettre en œuvre le programme. Car il y a des zones au Bénin, où ce n'est pas forcement l'ordinateur qui sera l'outil final de l'utilisateur.

Dans ce cas l'audiovisuel est utilisé comme un objet de propagande ?

Tout à fait.

Le MCTIC ou l'Etat d'une manière générale dispose t-il d'un fonds d'aide dont peuvent bénéficier les radios ?

Seul mon collègue en charge de la Direction générale du développement des médias peut répondre à cette préoccupation.

Il existe une aide de trois cent millions à la presse privée et donc à l'audiovisuel privé ?

C'est un fonds logé à la Haute autorité de l'audiovisuel et de la communication (HAAC). Il n'est pas géré par le ministère.

Existe t-il au Bénin des projets de développement de la connectivité à l'Internet ?

Oui. Ce sont des projets sectoriels auxquels nous apportons des soutiens. Ce sont des projets qui naissent des partenariats entre les communes et leurs partenaires au développement ou les communes européennes. C'est le cas par exemple du projet d'interconnexion des communes du Plateau, dans le cadre d'un partenariat avec la commune du Grand Chalon en France. C'est un projet qui a démarré il y a un certain temps. Le gouvernement au travers du MCTIC y est impliqué à la suite du forum du haut débit dans les communes qui avait eu lieu en France. A la suite des communes du Plateau ce sont les communes de l'Atacora dans la région septentrionale du Bénin qui vont bénéficier du même type de projet dans le cadre d'une coopération avec la commune du Grand Lyon. Ainsi, étape par étape, la connectivité sera répandue à toute les communes du Bénin.

Est-ce le seul projet de grande envergure ?

Il y a aussi le « Projet Poste Cyber ». C'est un projet qui consiste à mettre en réseau tous les bureaux de poste du Bénin. En effet, la poste a un réseau très étendu au niveau des communes et qui est utilisé par le système financier. C'est un projet qui permettra de faire pénétrer les TIC au sein des communautés. Les bureaux de postes pourraient être utilisés pour faire des formations et un certain nombre de services seront développés autour de ce réseau.

Quelle est la relation entre le MCPTN et la HAAC en matière de gestion des TIC ?

Il n'y pas un cadre particulier. Par contre il existe un comité HAAC-MCTIC qui a été mis en place depuis un certain temps pour discuter de toutes ces questions. C'est dans ce cadre que sont discutées les questions relatives au TIC entre les deux institutions.

Le Bénin dispose t-il d'une stratégie ou d'une politique de développement ou de promotion des radios ?

C'est mon collègue en charge de la Direction du Développement des Médias qui est mieux qualifié pour répondre à cette préoccupation.

L'autorité de régulation des télécoms intervient-elle dans l'utilisation des SMS et des appels téléphoniques au niveau des médias, en particulier à la radio ?

Ce que je crois, c'est qu'elle devrait intervenir. Mais je pense qu'il va falloir s'adresser à eux pour avoir la bonne information.

Propos recueillis par Hippolyte DJIWAN

Benin

M. Karl DJIMADJA,
Directeur Général RADIO STAR

« En matière d'appropriation des TIC, les derniers risqueront d'être les premiers »

Radios Star installée en plein cœur de Cotonou est la dernière en matière d'appropriation des TIC selon son Directeur général Karl DJIMADJA. Mais depuis quelques semaines, la radio a entamé une renaissance numérique. Et le directeur avertit : « *Les autres radios devront faire très attention car les derniers risqueront d'êtres les premiers*. »

Cela fait une semaine que Radio Star s'est abonnée au réseau internet. Pourquoi avez-vous attendu si longtemps ?

J'ai pris la direction de la radio il n'y a pas longtemps. Certainement avant moi, celui qui la gérait n'avait pas jugé de l'utilité de la connexion au réseau internet. J'ai jugé donc que cela est important dans le cadre de l'amélioration de nos services aux auditeurs et dans le cadre de la mise à jour de la radio parce que aujourd'hui, une radio sans les TIC, c'est sombrer dans le passé.

Avoir une connexion internet peut-il apporter quelque chose à la radio ?

Aujourd'hui, la technologie que constituent les TIC est utile dans presque tous les domaines de la vie. Ce n'est pas dans un secteur aussi sensible que la communication qu'on devrait s'en passer. Donc, cela doit beaucoup nous apporter. Ne serait-ce que sur le plan de l'audience. Par exemple, en voyage, nous pouvons suivre de loin ce que sont en train de faire nos collaborateurs. Il en est de même pour les gens, notamment les touristes qui sont passés en visite à Cotonou, qui ont aimé nos programmes et voudraient continuer de les suivre. Enfin il y a la diaspora qui pourra aussi suivre nos émissions sur internet… Autant de choses qui peuvent être un plus, grâce à l'appropriation des TIC par la Radio.

Diffuser vos programmes sur internet permet d'atteindre quels objectifs ?

Elargir notre auditoire et nos relations, puis permettre à nos partenaires et d'autres personnes physiques ou morales vivant hors du Bénin, qui souhaitent atteindre le public du Bénin de savoir qu'il y a une radio, la nôtre, qui peut leur permettre d'atteindre leurs objectifs sans se rendre au Bénin.

Vos ambitions demandent de l'investissement… vous en avez les moyens ?

Nous allons mettre la main à la pâte et à l'occasion compter également sur nos partenaires.

Avez-vous l'impression que vos collaborateurs s'approprient les TIC (Clés Usb, enregistreurs numériques, etc.) ?

Oui et non, parce que c'est une question d'habitude. Il y a certains qui ont du mal à utiliser ces nouveaux moyens de communication et de production. En effet, certains sont d'un niveau d'instruction moins élevé et estiment qu'utiliser internet et les clés USB est trop compliqué. Ils préfèrent peut être graver leurs éléments sur des CD et les transporter manuellement que d'entrer dans un univers qui pour eux est réservé aux plus lettrés. Ce sont des difficultés auxquels nous sommes confrontés et il faut faire un effort pour sensibiliser les uns et les autres sur l'utilité et le côté pratique des TIC. Mais ce n'est pas toujours facile car certains restent bouchés et fermés.

Votre adresse e-mail est aussi celle de la radio. Comment cela s'explique t-il ?

Comme je l'ai dit, la radio n'avait pas une adresse e-mail avant mon arrivée à la tête de la radio. Peut-être mon prédécesseur n'avait pas jugé de l'utilité de le faire. C'est donc bien que pour le moment, nous avons commencé par mettre la radio sur la voie de la numérisation. Car il y a encore quelques jours, la radio n'utilisait que les lecteurs CD et DVD. Mais maintenant, nous avons commencé par numériser. Nous avons installé un ordinateur et une base de sons pour pouvoir déjà être un peu au pas. De plus en plus, on évite les disques qui "sautent", ou qui sont rayés. Pour la question relative à l'adresse e-mail, il faut peut être demander à mon prédécesseur pourquoi il n'y en avait pas une pour à la radio.

Votre station dispose de très peu d'ordinateurs, cela veut-il dire que les journalistes continueront d'écrire les articles manuellement ?

Bien sûr. Pour beaucoup, c'est plus pratique d'écrire à la main que d'aller tout de suite à l'ordinateur. C'est une question d'habitude. Et pour ceux qui n'ont pas un ordinateur avec lequel ils travaillent de façon permanente, ils n'ont pas la rapidité requise pour saisir leurs articles. Il vaut mieux pour eux écrire que de se mettre à saisir sur l'ordinateur.

Quels sont vos projets futurs en matière de TIC pour la radio ?

On peut remarquer que notre radio est une des dernières à Cotonou en matière d'appropriation des TIC puisque c'est maintenant que nous venons d'installer un ordinateur pour gérer le son à l'antenne. Mais les autres radios devront faire très attention car les derniers risqueront d'être les premiers.

Sierra Leone

Usage of the ICTs by SKYY Radio 106.6 fm Freetown	
Usage	SKYY radio has implemented Analogue and Digital broadcast daily. Their Producers use Mini Disc recorders, mobile phones recorders, MP3, iPods, to conduct interviews which have replaced cassettes and Reels. They produce their broadcast programmes using PC's. Adobe Audition 2.0. software is used to edit. They have replaced reel to reels and cassette to cassette with Pentium IV computers and editing software in the studio. Raduga and Media player are used to program 1 to 4 hours unas sisted broadcast. Normally all broadcast are live. SMS messages and mobile phone calls are used in live discussion talk shows as well as announcing election results etc. This is their first phase of their digitalization.
Activities	- Broadcast 20 hours daily - Produce jingles - Host live talk and discussion programs - They do live commentaries of events (disaster, crisis, sports, elections etc) - Their Broadcasters regularly host music, entertainment and jokes programmes. - The station broadcast news on the hour with links from VOA on a satellite feed. - Exclusively broadcast host child broadcasters live for 1 hour daily and provide apprenticeship for child broadcasters.
Technical Aspects	- They have added two PCs installed in the live studio and three PCs installed in the production studios. - Four mobile telephones are installed to the mixers for phone-in programmes and news gathering. - Five Mini Disc recorders, 2 GB flash drives, mobile phones and iPods have being issued to nine producers. - Internet is connected and available in all 3 computers in the production studio. - They have a telephone hybrid for live coverage

Main Actors	The Management and Production staffs
Obtained results	- Maximized useful production time - Better sound quality - Trained producers - Increased Audience - Technical efficiency improved
Constraints	1. Technical: There is no National Power available so the equipments use electricity from a generator with high running cost. 2. Financial: No bank loans, financial support to have a redundancy system 3. Training: Lack of financial assistance to support training in digital programming.
Perspectives	This station expects to have a website and broadcast live on the internet in 2008
Partners and financing	Financing is sole by SKYY as reinvestment
Contacts	Anita Baryoh, Managing Director, +232 77 854979 (Mobile) +232 22 223136 (Office) **anitabaryoh@yahoo.com**

Sierra Leone

Usage of the ICTs - Radio Station KISS 104 fm (Radio-Bo) Bo, Sierra Leone	
Usage	KISS FM (Radio-Bo) has innovated its production process from analogue to digital and now broadcast clear quality broadcast in the rural provinces. Being a rural radio broadcasting station, with demand for information from the capital city to be translated into the local languages (Mende, Temne, Limba, Fullah and Krio). Mini Disc recorders are used by producers to gather information; they have replaced cassettes and Reels. For editing audio, the producers use PC's, running Adobe Audition 2.0. software. They have replaced cassette to cassette editing. For broadcast automation, Media player and DJ Mix are used to program 1 to 4 hours unassisted broadcast. For public interaction into their programmes, SMS messages and mobile phone calls are used in live discussion talk shows. For Live public /outdoor broadcasts, they use mobile telephone hybrid links capable of linking actors from any part of the country.
Activities	Broadcast 18 hours daily Produce jingles, skits, drama Host's Live talk show and discussion programs Broadcast Live commentaries Provide music, entertainment and information.
Technical Aspects	- Two PCs are installed in the live studio - Three PCs are installed in the production studio - Four mobile telephones are installed to the mixers. - Mobile phones with group discount calls are issued to 11 Producers. - Two laptops are used by the heads of News and Programmes respectively. - Nine Mini Disc recorders are issued to each producer. - All producers and Management staffs have USB Flash Drives.

Main Actors	- The General Manager - Production Manager - News Director - Producers and Hosts
Obtained results	- Maximized useful production time - Better sound quality - Trained producers - Increased audience - Technical efficiency improved
Constraints	1. Technical: There is no National Power available so the equipments use electricity from a generator with high running cost. 2. Financial: No bank loans, financial support to have a redundancy system 3. Training: Lack of financial assistance to support training in digital programming.
Perspectives	This station expects to broadcast live on the internet in 2008. The station will distribute programmes on CDs to other stations.
Partners and financing	Sole Financing is by KISS Management as reinvestment.
Contacts	Samuel Haffner, General Manager, +232 77 640162 (Mobile) **samuelhaffner@yahoo.com**

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Appendix 3:
LIST AND CONTACT DETAILS OF RADIO STATION SURVEYED

Name of radio station	Telephone	Type	Country
Radio CITE SAVALOU CULTURE FM 87.8	+229 22 54 05 31 or 95 61 56 27	Community	Benin
Radio KANDI FM: 102.9	23 63 00 91	Community	Benin
Radio TONASSE FM: 107.2	22 52 00 07 / 22 52 01 00	Community	Benin
Radio UNIVERS (The University broadcasting station)	21 00 77 10 / 97 13 75 49	Community	Benin
NAANE-OUASSA FM 98.7 22995615546		Community	Benin
TUKO SARI FM 105.8 MARI District in Kouandé	95 61 56 07	Community	Benin
Radio Bembèrèkè NON SINAN FM 90.8	23 62 12 51	Community	Benin
Radio of Banikoara FM 104.2	23 65 00 50 (tel and fax)	Community	Benin
KPABLY FM 99.4	95 61 56 02 /95 61 56 03	Community	Benin
Radiodiffusion Nationale du Bénin/ ORTB	21 30 04 81 / 21 30 00 48/ 21 30 10 96	Public	Benin
ALLIANCE FM 97.00	21 10 14 46 / 21 10 14 47	Commercial	Benin
RADIO STAR FM 94.3	21 32 67 65	Public	Benin
ADO FM 00229	21 38 02 71 / 21 38 02 72	Public	Benin
Radio ALLELUIA FM 96.5	20 22 68 01 / 20 22 68 02 /20 22 68 03	Religious	Benin
Radio-Ecole/APM (NPM for the Promotion of the Media)	90 90 02 24 /95 06 03 31 / 20 21 26 88	Community	Benin

Fraternité FM	23 61 18 80	Community	Benin
GOLFE FM 105.7	21 32 42 08 / 21 32 42 09	Commercial	Benin
Radio PLANETE, 95.7	21 30 30 30 / 21 30 35 93	Commercial	Benin
RADIO ARZEKE FM	23 61 22 20	Commercial	Benin
OCEAN FM, la Radio des Défis	21316252 / 21316253	Commercial	Benin
Radio Al Houda	+226 50 38 66 60	Religious	Burkina Faso
Radio Taanba	+226 40 77 02 33 / 40 77 07 04	Religious	Burkina Faso
Radio Fréquence espoir	+226 20 52 03 22	Religious	Burkina Faso
Radio Alliance Chrétienne	+226 20 97 32 50	Religious	Burkina Faso
Radio Ave Maria	+226 50 31 70 70 / 50 31 29 70	Religious	Burkina Faso
Radio GAMBIDI Tél	+226 50 36 58 08	Community	Burkina Faso
RTB- Gaoua	+226 20-90-03-48	Public	Burkina Faso
Radio Cascades	+226 20 91 04 04	Commercial	Burkina Faso
Radio Salaki	+226 20 52 10 22/ 70 25 36 39	Community	Burkina Faso
Radio Wiskamba	+226 50 44 00 86	Commercial	Burkina Faso
Radio Or FM Sanematenga	+226 40 45 37 75	Commercial	Burkina Faso
Radio du Grand Nord	+226 40 46 04 36	Commercial	Burkina Faso
Notre Dame de la Réconcilition	+226 50 44 07 61	Religious	Burkina Faso
Radio Salankoloto	+226 50 33 22 80 / 50 31 64 93	Community	Burkina Faso

Burkina Faso Radio Evangile Développement Bobo	+226 20 97 00 50	Religious	Burkina Faso
Canal Arc-en-ciel	50 32 41 41	Public	Burkina Faso
RADIO DE L'AMITIE	+226 40 55 01 19 / 40 55 05 21	Commercial	Burkina Faso
POG-NERE DE POUYTENGA	40 70 60 75	Community	Burkina Faso
Radio Jeunesse	50 30 43 31	Public	Burkina Faso
Radio des écoles	50 37 88 87	Community	Burkina Faso
Radiodiffusion du Burkina	50 31 04 41	Public	Burkina Faso
Radio vive la paysan	+226 50405621	Community	Burkina Faso
Radio LA VOIX DU SUD OUEST de Diébougou	20 90 52 58 / 70 15 16 08 / 70 24 77 58	Community	Burkina Faso
RADIO NOSTALGIE	50 30 17 77 / 50 30 20 20	Commercial	Burkina Faso
RADIO KAKOAADB YAM VENEGRE	50 30 97 69	Community	Burkina Faso
PULSAR 94.8 FM 45	+226 50 31 41 99 / 50 30 75	Commercial	Burkina Faso
Radio Progress	+233 75 622730	Community	Ghana
Oman Fm	021-920222 / 520250 / 520293	Commercial	Ghana
Kessben Fm	051-37404 / 5 / 7	Commercial	Ghana
Hello Fm	051-80861 / 80863 - Fax 051-80864	Commercial	Ghana
Kapital radio	051-29010 / 051-29040	Commercial	Ghana
New Mercury fm	051-21958 / 21594 / 21591	Commercial	Ghana
Angel Fm	051-23883, 33541, 28858	Commercial	Ghana

Sunny Fm	021-225716, 021-225719	Commercial	Ghana
Radio Gold	+233 3-21-300281 / 2	Commercial	Ghana
Choice Fm	021-7010384	Commercial	Ghana
Top radio	024-4377211 / 0203001	Commercial	Ghana
Shalom Radio	064-222614 / 0243516767	Religious	Ghana
Skyy Power 93.5 Fm, Skyy Tv	243002222 / 3126363 /207742000	Commercial	Ghana
Skyy Power Fm	031-25288 / 25299 / 26363	Commercial	Ghana
Goodnews Fm	031-25451 / 24888	Commercial	Ghana
ROK 98.7 Fm	031-29357	Commercial	Ghana
Melody 91.1 Fm	031-21663 / 29313 / 21880	Commercial	Ghana
Kyzz Fm	031-24212	Commercial	Ghana
Nhyira Fm	051-35660 / 36551 / 2	Commercial	Ghana
Garden City Radio	051-22331 / 22050	Public	Ghana
Spirit Fm	051-37606	Commercial	Ghana
Luv FM	051-21577/8/9/80	Commercial	Ghana
Obonu	+233 22202350 / 22205622/23	Public	Ghana
Solid fm	051-42361/42362	Commercial	Ghana
Joy Fm	231258, 7011997, 7011999	Commercial	Ghana
Atlantis Radio	021-7011212	Commercial	Ghana

Radio Ada	+233 96822371	Community	Ghana
Uniiq Fm	+233 021221147	Public	Ghana
Vibe 91.9 Fm	+233 217011444 / +233 217011305	Commercial	Ghana
Meridian Fm	+233 22210910	Community	Ghana
CITI FM	+233 21224873	Commercial	Ghana
Radio Jamana de DJENNE	+223 618 18 20	Community	Mali
Radio KOUNARY de SEVARE	+223 242 11 79	Commercial	Mali
Radio FOKO de SEGOU	+223 232 00 48	Community	Mali
Radio Jamana de Mopti	+223 2430 147	Community	Mali
Radio Jamana de NIORO	+223 254 04 56	Community	Mali
Radio Jamana de Koutaila	+223 2640 134	Community	Mali
Radio Dunya de SIKASSO	+223 262 03 88	Community	Mali
Radio Sinignésigui de Sikasso	+223 262 23 30	Commercial	Mali
Radio Sika FM	+223 262 06 49 / +223 672 49 94	Community	Mali
Radio Bendé de Sikasso	+223 262 07 90	Community	Mali
Radio Sababou de Zégoua	+223 672 81 71	Commercial	Mali
Royal FM Zégué khan	+223 672 81 71	Commercial	Mali
Radio Royal FM Tatou-khan de Sikasso	+223 2621 815	Commercial	Mali
Radio Soni D'Ansongo	+223 521 92 06	Commercial	Mali

Radio “Voix de Alfaida” ANEFIF - Kidal Region	+223 347 92 26	Community	Mali
Radio Sigui FM de Kayes	+223 252 25 42	Community	Mali
Radio Tisdas de Kidal	+223 608 22 97	Community	Mali
Radio FM Anmiwad de Abeybara	+223 523 15 86	Community	Mali
Radio BINGHA de Diré	+223 915 73 36	Community	Mali
Radio Rurale de Menaka	+223 688 28 80 / +223 685 35 09	Community	Mali
Radio TADAMAKAT d’Essouk	+223 2850 230	Community	Mali
Radio Annia de GAO	+223 2820 682	Commercial	Mali
Radio communautaire d’Almoustrat	+223 517 00 57	Community	Mali
Radio Guiba de Goundam	+223 936 91 00	Religious	Mali
Radio Jamana de Tombouctou	+223 292 14 20	Community	Mali
Radio NAATA de GAO	+223 2820 314/ +223 605 18 35	Community	Mali
Radio DODYA de Anderhaboucane	+223 442 11 99	Community	Mali
Radio Tatrit de Timetrine	+223 541 62 31	Community	Mali
Radio Jamana de Koulikoro	+223 226 23 01	Community	Mali
Radio Hanna de GAO	+223 2820 451	Community	Mali
AADAR de GAO	+223 2 821 174	Community	Mali
Radio KOIMA de GAO	+223 90978 29	Commercial	Mali
Radio Bourem INALI	+223 915 70 94	Community	Mali

Radio ALKHABAR de Gourma Rharous	+223 503 89 74	Community	Mali
Radio Communautaire de BOUREM	+223 685 36 67 / +223 313 71 37	Community	Mali
Radio Bonférey de TABOYE	+223 521 88 05	Community	Mali
Radio THIOCKY de Tonka	+223 932 04 79	Community	Mali
Radio Kolol Sobbundu	+223 293 40 19	Community	Mali
Radio Rurale de KAYES	+223 253 14 76 / +223 258 00 81 / +223 258 0150	Community	Mali
Radio Islamique, voix du coran et du hadith	+223 221 63 44	Religious	Mali
Radio Maradémè de DIOILA	+223 225 63 00	Community	Mali
Radio DAMBE	+223 223 56 56 / + 223 223 57 57	Religious	Mali
Radio TABALE	+223 222 78 70	Community	Mali
Radio Liberté de Bamako	+223 223 05 81 / +223 683 83 15	Commercial	Mali
Radio Canal 2000	+223 221 28 49	Commercial	Mali
Radio Patriote de Bamako	+223 224 22 92	Commercial	Mali
Radio Chaine II de l' ORTM	+223 221 47 29	Public	
Radio BENKAN de Bamako	+223 221 46 02	Community	Mali
Radio Kayira I de Bamako	+223 224 87 82	Community	Mali
Radio KLEDU	+223 221 00 18	Commercial	Mali
Radio ESPOIR	+223 220 67 08	Religious	Mali
ZTillabery		Community	Niger

ZDiffa		Community	Niger
ZTanda Communautaire Niger		Community	Niger
ZDan Tchandou Communautaire Niger		Community	Niger
Zabalak Communautaire Niger		Community	Niger
ZChirorerine Communautaire Niger		Community	Niger
ZSimiri Communautaire Niger		Community	Niger
ZSay Communautaire Niger		Community	Niger
ZKahé Communautaire Niger		Community	Niger
ZMirriah Communautaire Niger		Community	Niger
ZKeita Communautaire Niger		Community	Niger
Zilléla Communautaire Niger		Community	Niger
ZTesaoua Communautaire Niger		Community	Niger
ZMayahi Communautaire Niger		Community	Niger
ZBelbedji Communautaire Niger		Community	Niger
ZMagaria Communautaire Niger		Community	Niger
ZGouré Communautaire Niger		Community	Niger
ZChétimari Communautaire Niger		Community	Niger
ZGeskérou Communautaire Niger		Community	Niger
ZTéra		Community	Niger

ZTouraki		Community	Niger
Radio IFTIC	+227 733706 / 00227733829	Community	Niger
Radio Tambara	+227 20737777	Commercial	Niger
Radio Canal 3	+227 20740119	Commercial	Niger
La Voix du sahel	+227 20722208	Public	Niger
Radio Dounia	+227 20740085 / 20740052 / 20740227 / 20740228	Commercial	Niger
Radio Anfani	+22720740908 / 0022720740880	Commercial	Niger
Radio Ténéré	+22720736574 / 0022720736575 / 002272073657476	Commercial	Niger
Radio Saraounia	+227 20733420	Commercial	Niger
Radio communautaire des jeunes de Goudel (Jeunesse FM)	+227 94840249	Community	Niger
Alternative FM	+227 20 74 34 10	Community	Niger
DALLOL FM	+227 96 98 14 86 / +227 20 65 42 65 / +227 93 80 21 10	Commercial	Niger
OCEAN FM		Commercial	Senegal
WalfFM		Commercial	Senegal
Sud FM Mbour		Commercial	Senegal
Sud FM thies		Commercial	Senegal
Dunya Ziguinchor	+221 33 991 12 39	Commercial	Senegal
Sud FM	+221 33 824 33 06 / 33 824 33 15	Commercial	Senegal
Dunya Dakar	+221 33 824 24 24	Commercial	Senegal

Radio Dunya St Louis	+221 33 8611519	Commercial	Senegal
Radio Dunya Kaolack	+221 33 8492265	Commercial	Senegal
RTS Tamba	+221 849 12 00	Public	Senegal
RTS Kaolack	33941	Public	Senegal
Chaine Nationale	+221 33 849 12 44	Public	Senegal
AWAGNA FM	+221 88 428 16 29	Community	Senegal
TERANGA FM	+221 33 961 42 05	Commercial	Senegal
ANNUR FM	33 860 4992	Commercial	Senegal
Manooré FM	+221 33 864 38 38	Community	Senegal
Djolof FM 87.6	+221 33 968 11 56 / 77 657 67 57	Community	Senegal
Radio Sénégal International	221 33 8491245	Public	Senegal
NIANI FM	+221 33 982 22 05	Community	Senegal
Oxyjeunes 103.4 FM	+221 33 834 86 22	Community	Senegal
Gaynaako FM	+ 221 77 508 43 80	Community	Senegal
DissoFM	33 976 1786	Commercial	Senegal
AFIA FM	221 33 867 21 53	Community	Senegal
RADIO FUTURS MEDIAS (RFM)	+221 33 849 16 40	Commercial	Senegal
CENNER FM	33 823 9796	Religious	Senegal
Siggil Jigeen (Promotion of women)	33 953 17 72 / 77 657 12 57	Community	Senegal

JOKKOO FM	+221 33 836 04 64	Community	Senegal
Timtimol FM	+221 33 966 61 00	Community	Senegal
JIIDA FM Dakar 105.3	+221 33 867 02 20	Community	Senegal
Radio Nongowa	+232 22 042 200	Community	Sierra Leone
Gender FM	+232 22 226 577	Community	Sierra Leone
Ministry of Education Radio	+232 22 240 844	Public	Sierra Leone
Radio Galaxy	+232 22 220 783	Community	Sierra Leone
Radio Bontico	+232 76 439 946	Community	Sierra Leone
LeoneVoice of Islam	+232 76 628 423	Religious	Sierra Leone
Radio Life Ventures	+ 232 22 224 803	Religious	Sierra Leone
Voice of Handicapped	+232 22 228 309	Community	Sierra Leone
Voice of women FM 88	+232 76 875 764	Community	Sierra Leone
Radio Wanjei	+232 76 776 808	Community	Sierra Leone
SLBS/bo	+232 76 638 420	Public	Sierra Leone
SLBS/Kenema	+232 76 537 838	Public	Sierra Leone
Radio Gbafth	+232 76 823 902	Community	Sierra Leone
Radio Kolenten	+232 76 514 166	Community	Sierra Leone
Radio Mankneh	+232 76 911 190	Community	Sierra Leone
Radio Moa	+232 76 958 929	Community	Sierra Leone

Radio Bintumani	+232 76 994 646	Community	Sierra Leone
Radio Maria	+232 76 715 176	Religious	Sierra Leone
Radio new Song	+232 76 578 829	Religious	Sierra Leone
Radio BBN	+232 22 221 425	Religious	Sierra Leone
Free Radio 95.7 Fm	+232 33 713 171	Commercial	Sierra Leone
Radio Kalleone 105.7 Fm	+232 76 611 590	Commercial	Sierra Leone
We Yone radio 88.8 Fm	+232 77 462 243	Public	Sierra Leone
Radio new Song	+232 76 578 829	Religious	Sierra Leone
Radio BBN	+232 22 221425	Religious	Sierra Leone
Free Radio 95.7 Fm	+232 33 713 171	Commercial	Sierra Leone
Radio Kalleone 105.7 Fm	+232 76 611 590	Commercial	Sierra Leone
We Yone radio 88.8 Fm	+232 77 462 243	Public	Sierra Leone
Eastern Radio	+232 22 42610	Community	Sierra Leone
Radio Democracy Communautaire	+232 22 9465 / 230 036	Community	Sierra Leone
Radio Mount Aureol	+232 76 460 422 / 30 160 270 / 77 530 881	Community	Sierra Leone
SKYY Radio 106.6 Fm	+232 22 223 136 / 76 575 675 / 76 697 764	Commercial	Sierra Leone
Choice Fm Lungi	+232 33 546361 / +232 77 824147	Community	Sierra Leone
Radio Tombo Fm 98.0	+232 76 751 301	Community	Sierra Leone
Radio Bo (Kiss 104 Fm)	+232 77 580 995	Commercial	Sierra Leone

Appendix 4:
WEST AFRICAN RADIO WEB SITES

The research was mainly focused on the countries targeted in the study – it was not exhaustive but around 70 websites were identified. However, a great number of these sites do not have any content, or have quite unstable streaming. Ghanaian radio stations websites seemed to offer the most stable audio streaming audio and content.

Name of radio station	Website	Country	Presence of streaming /podcasts /other notes	Last date consulted
Golfe Medias	http://www.golfemedias.com http://www.golfemediaonline.com	Benin	Little content, except for the possibility of downloading programmes schedule, streaming not working	07/10/2008
Radio Bembereke	http://www.nikki-bembereke.org	Benin	Programmes schedule and some photos available, but no streaming or podcast	07/10/2008
Radio Ecole APM	http://omroep.typepad.com/radioecoleapm/	Benin	Blog showing radio equipment, written in English, not updated since October 2007	07/10/2008
Radio nationale du Bénin	http://www.ortb.bj	Benin	Some recent podcasts available	07/10/2008
Radio Nikki	http://www.kessbenfm.com	Benin	Programmes schedule and some photos available, but no streaming or podcast	07/10/2008
Radio Parakou	http://www.ortb.bj	Benin	Some recent podcasts available	07/10/2008
Radio Univers	http://www.radiounivers.site.voila.fr	Benin	This page previously hosted for free, no longer exists	07/10/2008
Mon pulsar	http://www.monpulsar.com	Burkina Faso	Programmes schedule available, photos on-line, Section “Listen to programmes again on-line” with the note “Coming soon…”	07/10/2008

Radio Burkinabée	http://www.radio.bf	Burkina Faso	Brief programmes schedule, no streaming	07/10/2008
Radfi Jam	http://www.radiojam.ci	Côte d'Ivoire	Streaming available	07/10/2008
Alternative Voice online Radio for Gambians (AVG)	http://radioavg.com/website/	Gambia	Podcasts, streaming currently not available	07/10/2008
Angel FM	http://www.angelfmonline.com	Ghana	Account suspended	07/10/2008
City FM Online	http://www.citifmonline.com	Ghana	The streaming works once on the home page, file for each radio programme	07/10/2008
Ghana News Today	http://www.ghananewstoday.com	Ghana	Section "Audio on demand" without content; Webradio exclusively	07/10/2008
Kessben FM	http://www.kessbenfm.com	Ghana	Content apparently very regularly updated, streaming not working	07/10/2008
Melody FM 911	http://www.melody911.com	Ghana	Section Melody FM 911 live exists but does not work	07/10/2008
My Choice FM	http://www.mychoicefm.com	Ghana	"On air" section redirects to ModernGhana.com, but the streaming does not work	07/10/2008
My Radio Gold	http://www.myradiogoldlive.com	Ghana	Streaming available	07/10/2008
	http://www.myskyyonline.com	Ghana	My Sky Online section "Listen Live" exists and active	07/10/2008
My Solid	http://www.mysolidonline.com	Ghana	Streaming available	07/10/2008
New Mercury FM	http://www.newmercuryfm.com	Ghana	Site exists but there is no content at all	07/10/2008
Oman FM	http://www.omanfm.kencity.com.gh	Ghana	Very little content. Last updating 17 June 2008	07/10/2008
Radio GBC	http://www.gbcghana.com/radio/index.html	Ghana	Streaming not available	07/10/2008
JOY FM	http://www.myjoyonline.com	Ghana	Streaming available in the "Online Radio" section with the possibility of listening to "Joy FM","Adom FM" and "Asempa FM"	13/10/2008

PEACE FM	http://www.peacefmonline.com	Ghana		13/10/2008
ONLINE ONLY	http://www.radiofocus.co.uk	Ghana	Streaming not working	13/10/2008
MY SPACE FM	http://www.myspacefm.com		Streaming not available. Link to BBC and Radio Canada International (RCI)	13/10/2008
ASEMPA FM	http://www.asempaonline.com	Ghana	Streaming available	13/10/2008
Ghanatta	http://www.ghanatta.nl	Ghana	Streaming not working	13/10/2008
ADOM FM	http://www.myjoyonline.com/radio/	Ghana	Streaming available	13/10/2008
Radio Univers	http://www.ug.edu.gh/radioUnivers	Ghana	Error: page not found	13/10/2008
Spice FM	http://spicefm.kencity.com.gh	Ghana	Streaming not working	13/10/2008
Ash FM	http://ashhfm.kencity.com.gh	Ghana	Streaming not available	13/10/2008
Sunny FM	http://www.sunnyfmonline.com	Ghana	No content; home page message: Welcome to Sunnyfmonline.com If you're looking for Christian Radio Stations, Christian Fm, Radio News Online or anything similar, go ahead and browse our comprehensive resource directory. You ought to find something interesting!	07/10/2008
Vibe FM	http://www.vibefm.com.g	Ghana	The domain exists but there is only the logo on the home page	07/10/2008
Radio Kankan	http://www.radio-kankan.com	Guinea Conakry	Error on the page	07/10/2008
(ORTM) La chaîne II de l'Office de la Radiodiffusion Télévision du Mali	http://www.ortm.ml/html/chaine2.php	Mali	Streaming working	07/10/2008
Radio Guintan	http://guintanbamako.radio.org.ml/	Mali	Site under construction	07/10/2008

Radio Jamana Koutiala Mali	http://www.jamanakoutiala.radio.org.ml	Mali	Site under construction	07/10/2008
Radio Dambé	http://www.kombinet.net	Mali	Streaming not working site still in construction	07/10/2008
Radio Kayira	http://www.kayira.org	Mali	Only written content updated nearly every week	07/10/2008
ORTN	http://www.ortn.niger.org	Niger	Cannot be found	07/10/2008
Radio Nigeria	http://www.radionigeria.com	Nigeria	Web radio	07/10/2008
Disso FM	http://www.dissofm.net	Senegal	Site still under construction	07/10/2008
Djoloff FM Sénégal	http://www.djoloffm.sn	Senegal	The section “Listen to the radio live” does not work, little content en dehors de la présentation	07/10/2008
Express News Streaming non fonctionnel	http://www.expressnews.sn/radio22.html	Senegal		07/10/2008
Radio Nostalgie Sénégal Streaming non fonctionnel	http://www.nostalgie.sn	Senegal		07/10/2008
Sud FM Diourbel	http://www.sudfm.net	Senegal	Podcasts and programmes schedule summary	13/10/2008
Aere Lao Radio	Hosted on www.xalima.com	Senegal	Streaming available and programmes schedule	13/10/2008
Ceenner FM	Hosted on www.xalima.com	Senegal	Streaming available - unstable	13/10/2008
Dahiratoul Moustarchidina wal Moustarchidaty	Hosted on www.xalima.com	Senegal	Streaming not working	13/10/2008
Jokkoo FM	Hosted on www.xalima.com	Senegal	Streaming not working	13/10/2008
Lamp Fall FM Dakar	Hosted on www.xalima.com		Streaming not working	13/10/2008
Lamp Fall FM Touba	Hosted on www.xalima.com	Senegal	Streaming available - unstable	13/10/2008
Océan FM Sénégal	Hosted on www.xalima.com	Senegal		13/10/2008
Radio Xalima	Hosted on www.xalima.com	Senegal	Streaming available - unstable	13/10/2008

RFM Dakar	Hosted on www.xalima.com	Senegal	Streaming available- unstable	13/10/2008
RMD FM	Hosted on www.xalima.com	Senegal	Streaming not working	13/10/2008
Sud FM	Hosted on www.xalima.com	Senegal	Streaming available - unstable	13/10/2008
Top FM	Hosted on www.xalima.com	Senegal	Streaming not working	13/10/2008
Soxna FM	http://www.excaf.com/radios/soxnafm/ soxn aindex.htm	Senegal	Streaming not working programmes schedule	13/10/2008
Dunyaa FM	http://www.excaf.com/radios/dunya/dunya.htm	Senegal	Streaming not working weekly programmes schedule	13/10/2008
RFM	http://www.futursmedias.net		Streaming available - until 7 October 2008 - domain expired and taken over by unknown party on 10 October 2008	07/10/2008
RTS	http://rts.sn/default_RTS1_sommaire.htm	Senegal	No streaming, simple programmes schedule	07/10/2008
Walf radio	http://www.walf.sn/radio	Senegal	Site without content, the link “listen” not working	07/10/2008
Sierra Leone Radio	http://www.sierraleoneradio.net/	Sierra Leone	Streaming not working, page hosted on http://www.africaninternetradio.com - it is apparently an on-line radio initiated from outside the country, but its services were not working in October 2008 - the radio currently targets a public extended to all Africans especially the diaspora	08/10/2008
Talking Drum Radio	http://www.talkingdrumstudio.org	Sierra Leone	(with programmes on Liberia, Guinea and Côte d’Ivoire) Different programmes produced are available in podcasts, several dozen programmes archived	08/10/2008
Radio Maria Togo	http://www.radiomaria.org/media/togo.asx	Togo	Streaming available	07/10/2008
Web Radio Togo	http://republicoftogo.com	Togo	Some podcasts available, but production does not seem regular	07/10/2008

Appendix 5: - QUESTIONNAIRE

Institut Panos Afrique de l'Ouest

The Panos Institute West Africa

Radio and ICT in West Africa: connectivity and use

The Panos Institute West Africa (PIWA - www.panos-ao.org) is a regional non governmental organization based in Dakar (Senegal) which has been working, among others, to strengthen the media sector in West Africa and beyond. The general aim of this study is to make an assessment of radio connectivity to ICTs (CDs, Internet, satellite, etc.), innovative uses experienced and challenges faced. Target countries are Ghana, Benin, Senegal, Mali, Sierra Leone, Burkina-Faso and Niger.

Please take some time (between 20 and 30 mn) to fill out this questionnaire. Selected interviews along with a documentary review will complement the findings of this questionnaire. PIWA will produce a publication following this research that we hope will contribute to strengthening the radio sector in West Africa. The publication will be available for all interested stakeholders. Participants in the survey will be valued in it.

Questions marked with an asterisk (*) require answers and the webpage will not be submitted if they are not answered.

Thank very much you for your collaboration. For more information, please contact the national coordinator or klohento@panos-ao.org at PIWA.

1. Identity of the radio

***1. Name of the station**

***2. Telephone number (s) of the station**

***3. Email address of the station**

***4. Location - Please also indicate the distance from the economic capital city (in km)**

***5. Date of creation**

***6. Type of radio**

- ☐ Public
- ☐ Commercial
- ☐ Community-based
- ☐ Confessional/religious

***7. Country**

- ☐ Benin
- ☐ Burkina Faso
- ☐ Ghana
- ☐ Mali
- ☐ Niger
- ☐ Senegal
- ☐ Sierra Leone

Additional comment on the country if applicable

***8. Please provide your name, function, email address and telephone.**

2. Access to and uses of the Internet

9. Is your radio station connected to the internet?

- ☐ Yes
- ☐ No (If your answer is "No" please move to question 14)

10. When did your radio station establish an internet connection? (Only one answer)

- ☐ Less than six months
- ☐ Between six and 12 months
- ☐ Between 13 months and two years
- ☐ Between 25 months and three years
- ☐ More than three years

11. Type of connection?

- ❑ ADSL (broadband)
- ❑ Wireless(Wifi,Wimax,radio,..)
- ❑ RTC (subscription through classical telephone line)
- ❑ LL (Leased Line)
- ❑ Other (please specify)

12. Who takes care of access fees? (Only one answer)

- ❑ The station itself
- ❑ A partner
- ❑ The state/government
- ❑ The partner and the station itself
- ❑ Other (please specify)

13. In the list below, please describe the main problems that the personnel/ radio hosts confront when using the internet?

- ☐ Access is limited to the management
- ☐ Improper knowledge of the use of internet
- ☐ High cost for internet connection
- ☐ Computer(s) not efficient
- ☐ Power outages
- ☐ Slow internet connection
- ☐ People are afraid of the internet or unwilling to use it
- ☐ Other (please specify)

14. If the radio station does not have an internet connection, what are the main reasons?

- ☐ High cost
- ☐ No computer at the station
- ☐ No access available at the station
- ☐ Absence of an adequate policy put into place
- ☐ The internet is hardly useful as it relates to radio stations
- ☐ I don't know
- ☐ Other (please specify)

15. (If your radio station does not have access to the internet:) How/where do you access the internet in times of need? (multiple answers possible)

☐ In a telecenter or cybercafé
☐ From someone's home
☐ We use a friend's internet access
☐ Internet is not useful for our radio
☐ Other (please specify)

16. Does the station have a website?

☐ Yes
☐ No (If you choose "No" or "Not Yet", move to question 18 after that)
☐ Not yet

Address of the website if applicable

17. How often is the website updated?

☐ Everyday
☐ Once a week
☐ Once a month
☐ Not regularly

18. Does the radio station have an online radio? (Online streaming)?

☐ Yes
☐ No
☐ Not yet
☐ If so, please provide the address of the site

19. Does the radio put audio content for download online (podcast)?

☐ Yes
☐ No
☐ Not yet
☐ If so, please provide the address of the site

20. What are the benefits of having streaming or content for download (streaming or podcast)? Respond only if you answered "Yes" to questions 18 or 19.

☐ Financial gains
☐ Increase in listening figures
☐ Policy mission
☐ Other (please specify)

21. What are the difficulties of radio streaming or posting of downloadable content? (Respond only if you answered "Yes" to questions 18 or 19).

☐ High cost
☐ Know-how
☐ The bandwidth is too feeble/the Internet is slow
☐ Other (please specify)

22. Who takes care of the costs associated with the online content? (Respond only if you answer to question 18 or 19 is "Yes")

☐ The station
☐ A partner
☐ The station and a partner
☐ Other (please specify)

3. Satellite broadcasting and reception

23. Does the station use a satellite in order to receive radio programs?

☐ Yes
☐ No
☐ Not yet (If your answer is "No" or "Not yet" please move to question 25)
☐ Other (please specify)

24. If your answer is "Yes", who is/are the program supplier(s)? (Please put a comma between each program supplier if applicable)

25. Does the station use a satellite to broadcast its programs?

- ❍ Yes
- ❍ No
- ❍ Not yet
- ❍ Other (please specify)

26. What is the coverage area? - What is/are the region/s covered (Please put a comma between each region if applicable)

27. (If your answer is "Yes" for questions 23 or 25) : what are the name(s) of the satellite(s) in each case?

28. (If your answer is "Yes" for questions 23 or 25 :) what are the advantage(s) of using the satellite? (Multiple answers possible)

- ☐ Financial gains
- ☐ Increase in the number of listeners
- ☐ Policy mission of the radio
- ☐ Access to useful information
- ☐ Other (please specify)

29. (If your answer is "yes" for questions 23 or 25 :) What are the constraints of using a satellite? (Multiple answers possible)

- ☐ High cost for using the satellite(s)
- ☐ Programming hours of programs received
- ☐ Inadequate equipment at the level of the radio
- ☐ Technical problems experienced with the reception
- ☐ Technical problems to broadcast programs
- ☐ Programme received not appropriate to local needs
- ☐ Other (please specify)

30. (If your answer is "yes" for questions 23 or 25 :) Who takes care of the cost (satellite or reception/broadcast equipment)?

- ❍ The station
- ❍ A partner (please precise the name below)
- ❍ The station and a partner
- ❍ We bear no charge
- ❍ Other comments?

4. Innovative use of telephone - Equipment, computer software - Capacity building

31. To what extent do the hosts/journalists of the radio use mobile phones for reports?

- ❍ Never
- ❍ Sometimes
- ❍ Regularly
- ❍ Always

32. Are SMS used as a means of communication with the listeners of the radio?

- ❍ Yes
- ❍ No

33. What are the uses of SMS at the station?

- ☐ Games
- ☐ Quiz
- ☐ Polls
- ☐ Interaction between hosts/journalists and audience
- ☐ No use
- ☐ Other (please specify)

34. In order to communicate with listeners, the station uses: (Choose only one answer)

- ❍ A vocal server
- ❍ A simple telephone line
- ❍ Both

35. How many computers does the station have?

- ☐ 0
- ☐ 1 to 2
- ☐ 3 to 5
- ☐ 6 to 10
- ☐ More than 10

36. How were the computers acquired?

- ☐ Donation
- ☐ Purchase
- ☐ Donations + purchase
- ☐ Other (please specify)

37. Are open source software used at the station?

- ☐ Yes
- ☐ No
- ☐ Don't know

38. If Yes, which one(s)?

39. How often are CDs and/or DVDs used in the station?

- ☐ Very high
- ☐ High
- ☐ Fair
- ☐ Low
- ☐ Non-existent

40. How often are digital recorders used?

- ☐ High
- ☐ Fair
- ☐ Low
- ☐ Non-existent

41. Is audio production available at the station (choose one answer)

- ☐ Analogical?
- ☐ Digital?
- ☐ Analogical and digital?

42. What kinds of software are used for audio production?

43. Describe the staff's skill set with regards to ICT use?

- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Low

44. To what extent are the personnel/hosts trained to use new ICTs?

- ☐ Never
- ☐ Regularly
- ☐ Rarely
- ☐ From to time to time

45. In what area(s) of ICT use do you consider training necessary for the personnel/hosts of the station?

46. Final comments - suggestions, etc.

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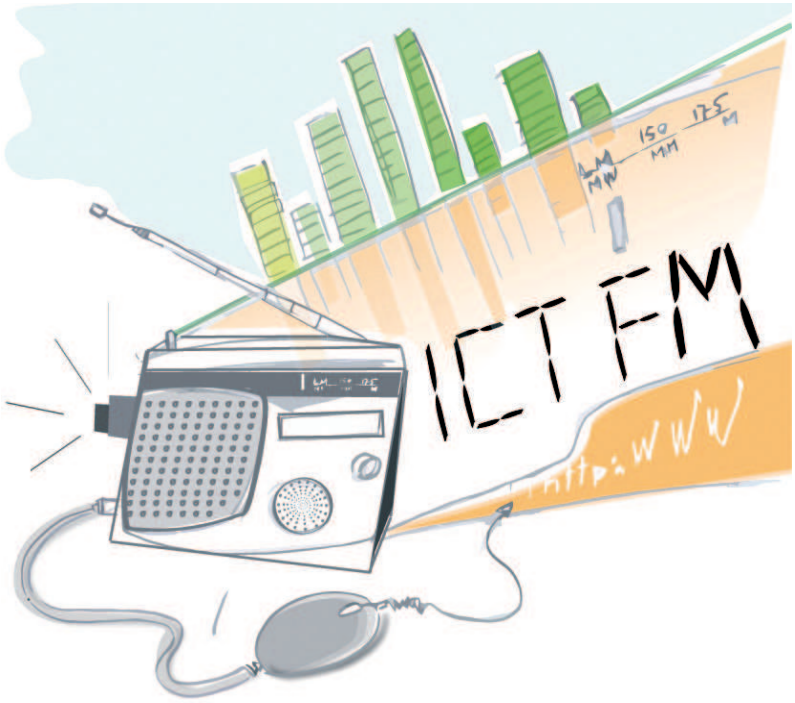
This study consists of carrying out a base-line study of West African radio connectivity to ICT (internet, satellite, computer, digital storage tools, etc.), analyzing the uses implemented, identifying the constraints and opportunities, and making recommendations to the different stakeholders.



The study concentrates on seven (7) targeted countries (Ghana, Benin, Senegal, Mali, Sierra Leone, Burkina Faso & Niger) and concerns all radio stations (community, commercial and religious). Two hundred and twenty (220) radio stations took part in the survey. The main tools of research used were questionnaires, interviews and documentary analysis.

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