

Côte d'Ivoire ICT Sector Performance Review 2009/2010

Arsène KOUADIO Konan, Ph. D
In collaboration with
Yakariya DOSSO, Engineer

*Towards Evidence-based ICT Policy and Regulation
Volume 2, Policy Paper 15, 2010*

CÔTE
D'IVOIRE

Research ICT Africa

Research ICT Africa is a non-profit public research network, which is concerned with information and communication technology (ICT) development policy and its governance. It is based in Cape Town, South Africa and is under the direction of Dr. Alison Gillwald. It aims to bridge the strategic gap in the development of a sustainable information society and a knowledge-based economy by conducting research on the policies and governance of the necessary ICT to document efficient governance in Africa. Initially financed by the CRDI, the network tries to extend its activities through national, regional and continental partnerships. The creation of the Research ICT Africa network meets the growing need for data and analysis necessary for an appropriate but visionary policy in order to propel the continent into the information age. Through the development of a network, RIA seeks to build an African knowledge base capable of supporting the ICT policy and regulation processes, and to ensure that the development of these processes is monitored on the continent. The research, coming from a public interest agenda, in the public domain and individuals, public and private sector entities and civil society are also encouraged to use it for training, future research or to make the most of it in order to enable them to participate more efficiently in the formulation of ICT policy and governance on national, regional and global levels. This research is made possible thanks to significant funds received from the International Development and Research Centre (CRDI), Ottawa, Canada, to whom the members of the network express their gratitude for its support. The network is formed by 18 African countries. Similar national studies are available for South Africa (Kammy Naidoo/Steve Esselaar), Benin (Dr. Augustin Chabossou), Botswana (Dr. Patricia Makepe), Burkina Faso (Dr. Pam Zahonogo), Cameroon (Prof. Olivier Nana Nzèpa), Côte d'Ivoire (Prof. Arsene Kouadio), Ethiopia (Dr. Lishan Adam), Ghana (Dr. Godfred Frempong), Kenya (Dr. Tim Waema), Mozambique (Francisco Mabila), Namibia (Dr. Christoph Stork), Nigeria (Prof. Ike Mowete), Rwanda (Albert Nsengiyumva), Senegal (Mamadou Alhadji Ly/Mar Cathy Dieng Sylla), Tanzania (Bitrina Diyamett), Tunisia (Prof. Farouk Kamoun) and Uganda (Dr. Nora Mulira).

Series Publisher: Dr. Alison Gillwald. Assistant Publishers: Enrico Calandro and Mpho Moyo.

Summary

Telecommunications are a priority in Côte d'Ivoire. Before the disengagement policy, initiated and applied by the Government in the 1990s, in which certain sectors opted out of national economic activities, the State kept its State authority monopoly throughout the development of telecommunication services in Côte d'Ivoire. The opening of the sector to competition from private operators was carried out in a legal and institutional framework, according to the Telecommunication Code adopted in 1995. Apart from the Ministry of NICT, which guarantees general telecommunication principles, two independent organs (ATCI and CTCI) under ministerial supervision carry out the regulation of telecommunication in Côte d'Ivoire, and a structure (FNT) carries out the financing of rural telephone operations and public programmes and projects relating to ICT.

The ICT market in Cote d'Ivoire is open. In addition, it integrates a typology of companies in very varied fields of activity and with different offers and services depending on access technology (which is increasingly innovative), and whether it is intended for households or companies.

Regarding mobile telephony, five operators are active and two have obtained their licenses but have not yet started business. Two operators hold a concessionary agreement, which allows them to provide the fixed-line service for a period of 20 years. Mobile telephone operators shared 10,449,036 subscribers in 2008. As for fixed-line telephones, there were 356,502 subscribers in 2008 with weak penetration in rural areas. Faced with this unharnessed market, private operators have made great efforts in order to provide telecommunication services to users living in the country.

As for the Internet, the ATCI has already issued about thirty licences of variable durations for Internet access provisions. The operators are connected to the Internet backbone via an earth station, BLR or private VSAT.

The audiovisual sector consists of public and private television channels, and public, private and local radio channels. Television channels include La Première, a national channel covering 80% of the territory before the crisis in September 2002, and TV 2, which broadcasts in a radius of 150 km around Abidjan. Along with these public channels, we also find two private operators, one offering an encrypted channel which allows users access to the news on various foreign

channels. The radio listener rate in 2009 was over 70%. This coverage comprises about twenty stations, including two national stations (Radiodiffusion ivoirienne and Fréquence 2), various local radio stations, and four international stations broadcasting in frequency modulation.

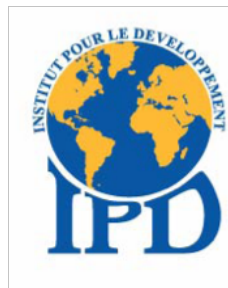
The rate plans for telephones are divided between prepaid or post-paid offers, and are at the same time diverse and variable from one operator to another. The price structure of Internet access is also dependent on access speed and subscription options.

Linking mobile telephony and banking currently provides Côte d'Ivoire with alternative payment methods to handling cash and entering bank details: M-payment and M-banking. Only Orange CI and MTN CI presently engage in M-payment, with 'Orange money' linked to the BICICI and 'MTN Mobile Money' linked to the SGBCI. Following the example of electronic applications, GSM operators compete for various GSM services.

Telecommunications energise the Ivorian economy and this can be seen in the formal sector as much as in the informal sector. From 1997 to 2008, mobile operators invested 820 thousand million F CFA. The ICT sector annually generates about 70 thousand million F CFA in VAT and relies on the existence of quality modern infrastructures. The size of the contribution of ICT to the economy of Côte d'Ivoire includes socio-economic as well as human development.

According to all the role players polled on the perception of the telecommunications regulatory environment, mobiles hold the highest average score (2.95) out of the three reference sectors, due to the increase in the number of GSM operators since 2006. Conversely, the fixed-line telephone sector lost a share of its receipts, and was relegated to the rank of worst performing sector after the Internet access provision sector.

This processes taking place in the telecommunications sector have since allowed each operator to revise service quality provided to the end user for improvement.



INSTITUT POUR LE DEVELOPPEMENT

Table of Contents

Introduction 1

Study Objective 2

Macro-Economic Environment in Côte d'Ivoire 3

Socio-Economic and Demographic Data (in 2008) 3

Administrative and Political Data 3

ICT Policies and Regulatory Environments in Côte d'Ivoire 4

Policies and Strategies 4

State of Play: Recent Developments and Current Projects 4

ICT Regulatory Environment in Côte d'Ivoire 6

ICT Market in Côte d'Ivoire 9

Market Structure and Technologies 9

Coverage and Revenues of the Telephone Market 17

Investments and Employment in the Telephone Market 18

Billing of the Use of ICT in Côte d'Ivoire 20

Mobile Telephone Rates 20

Fixed-Line Telephone Rates 20

Internet Access Provision Rates 21

Interconnection Costs 21

ICT: Electronic Applications and GSM Network Services 23

Electronic Applications 23

GSM Network Services 24

Contribution of ICT to the Ivoirian Economy 27

ICT and the Reduction of Disparities Issuing from the Digital Divide: The Zanzan Case 29

ICT and Modernisation of Agriculture, the Mainstay of the Economy 31

ICT and the West African Stock Exchange: A Real Time Quotation 31

ICT and Emergency of Informal Activities 32

Perception of the Regulatory Environment of Telecommunications in Côte d'Ivoire 33

Study Methodology 33

Presentation of Results 34

Interpretation of Results 35

Conclusion 38

Bibliographic References 39

Acronyms and Abbreviations 40

Introduction

Telecommunications have acquired capital importance over the past few years. The sector, as it exists today, is the result of diverse mutations brought about by the pressure of technological progress including the digitisation of networks, which led to an increase in the number and sophistication of services.

In numerous Westernised countries, telecommunications are powerful instruments in economic strategies, in integrating policies and in the development of the nation. In certain countries in the south, we increasingly see that development efforts (education, economic competitiveness, good governance, etc.) could not have been accomplished efficiently without Information and Communication Technologies (ICT).

From the start of 1991, Côte d'Ivoire engaged in a plan to stabilise and revive the national economy. This restructuring policy has been clearly defined to better meet the multiple telecommunication needs of companies as well as those of urban and rural populations. In order to do this, the following objectives were decided upon¹ :

- better satisfaction of the growing demand for services through increased geographic coverage ;
- the guarantee of free access to state-of-the-art technologies ;
- an improvement in service quality and client relations ;
- an increase in productivity in order to reach economies of scale, which would lead to a drop in service prices ; and
- the creation of a continental and international transit centre for Africa in Côte d'Ivoire.

Nowadays, there is a convergence, generally speaking, of New Information and Communication Technologies (NICT). This has led the current Government to create a NICT Department, with a focus on all the convergent systems of the telecommunication sector. In order to improve and increase the productivity and competitiveness of this sector, which is particularly vital to the national economy, the Government has undertaken a profound structural reform since 1995. This restructuring was undertaken via the ICT blueprint, which was adopted in 2002 and, which integrated about thirty projects. Amongst these projects, and in line with government's strategic objectives, we should mention the VITIB (Village des Technologies de l'Information et de la Biotechnologie – Village of Information Technologies and Biotechnology), which is a free zone in ICT and biotechnology.

According to the DSPR (2009)², ICT represents one of the three major pillars of the desired economic emergence of Côte d'Ivoire. The primary objective is to promote its emergence and accessibility as a means of sustainable development for the population as well as SMEs/SMLs throughout the national territory. Specifically, it involves :

- reducing the cost of services and equipment in order to facilitate the access of a larger number of people to ICT services ;
- developing telecommunication infrastructures and support ; and
- applying the liberalisation policy of the television sector.

The recommended way of reaching these objectives is that of liberalisation, which will ensure total telecommunication coverage of the territory, and, at the same time, will facilitate opening up the sector to other competing operators in order to reduce the number of services under State monopoly. Such a movement, with ICT at the epicentre, calls for a certain number of enforcement terms and conditions.

Setting up a solid regulatory framework for the development of the ICT market guarantees security and attracts national and foreign investments in the sector. Along these lines, the existence of a strong network infrastructure with readily accessible applications, which are affordable in terms of price and are easy to use, can also accelerate development.

It is in this framework that this collaborative study, under the aegis of RIA (**researchICTafrica.net**), was carried out in Côte d'Ivoire by its focal point IPD (Institute for Development, website: www.ipd-ci.org),

Côte d'Ivoire engaged in this process from the start of 1991 in application of the plan to stabilise and revive the national economy. This restructuring policy has been clearly defined to better meet the multiple telecommunication needs of companies as well as those of urban and rural populations.

According to the DSPR (2009), ICT represents one of the three major pillars of the desired economic emergence of Côte d'Ivoire.

¹ Context and objectives of the Bill, Telecoms Code, 1995.

² Government (2009), « Document de Stratégie de Réduction de la Pauvreté », Abidjan, point 671.

at the same time as in the other 17 member countries of the RIA network. RIA is a non-profit inter-African network researching public policies in ICT and is based in South Africa (Cape Town). It is represented in 18 countries including Côte d'Ivoire.

This is the third ICT performance exam in Africa carried out by the network. Previous results were very informative and contributed to the actions and strategies fuelling the field of ICT.

The current report is structured into seven sections. First of all, an introduction to the macro-economic environment in Côte d'Ivoire is presented. This is followed by a description of the ICT policies and regulatory environment in the country, an analysis of the Ivoirian ICT market and its billing, and the presentation of ICT through its electronic applications and GSM networks services. An analysis of the contribution of ICT to the economy of the country is discussed, and the study concludes with the perception of role players on the regulatory environment of telecommunications in Côte d'Ivoire.

Study Objective

This study is part of an approach that appropriates relevant data in the telephone (mobile and fixed), internet access provision and radio and television broadcasting sectors. The associated objectives essentially depend on :

- making a document available that contributes to the dialogue in ICT on the national level, between the regulation and the operators in the telecommunication sectors and on the supra-national level between the focal point of the RIA network and the international decision authorities in ICT ;
- synthesising the data relative to the telephone industry (mobile and fixed), internet access provisions and radio and television broadcasting into a single document ;
- showing the impact of ICT on the Ivoirian economy on the micro-economy (employability, investments in the sectors, etc.) and on the macro-economy (development and integration of territories, etc.) ;
- an assessment of the use of electronic applications and GSM services oriented to ICT in Côte d'Ivoire ;
- evaluating policy performance on aspects and laws that affect the telecommunications sector ;
- indicating the factors that result in a situation of malaise in the ICT sector and make recommendations for suitable recovery measures ;
- ensuring the influence of Côte d'Ivoire in ICT research networks and making it sustainable.

Macro-Economic Environment in Côte d'Ivoire

Socio-Economic and Demographic Data (in 2008)

Surface area	322,462 km ²
Total population	20,591,302
Urban population	49.9%
Currency	Franc CFA (655.56 FCFA = 1 €)
GDP	23,414,005,259 F CFA
GDP growth (annual variation in %)	1.77%
GNI per inhabitant	\$980
Direct foreign investments, cash flow	\$1,823,280,000,000
Merchandise trading (% of GDP)	52.5%
Service trading (% of GDP)	12.2%
Domestic credit supplied to private sector (% of GDP)	129.7%
Unemployment (% of the population)	4.1%
ICT expenses (% of GDP)	6%
R&D expenses (% of GDP)	2.2% (in 2007)
Time needed to start up a company	36 days
HIV prevalence (% of 15 to 49 years)	0.8% (in 2007)
Illiteracy rate	54.6%

Source : www.worldbank.org; data on Côte d'Ivoire, 2010

Administrative and Political Data³

Administrative Data

Côte d'Ivoire is subdivided into 19 regions, 56 departments and 2 districts. Since 21 March 1983, Yamoussoukro has been the political capital and Abidjan the economic capital. 7 August marks Independence Day. French is the official language of the country and there are about sixty national languages. Religions are represented as follows: Islam (38.6%), Christianity (32.8%), Animism (11.9%), Paganism (16.7%). Côte d'Ivoire shares a 584km border with Burkina Faso, 668km with Ghana, 610km with Guinea, 716km with Liberia and 532km with Mali.

Political Regime

Côte d'Ivoire is a presidential and multiparty republic and acquired its first constitution, which has since been revised seven times, on 16 October 1960. The new constitution was promulgated on 23 July 2000. Mr. Laurent Gbagbo has been the President since 26 October 2000 and Mr. Guillaume Kigbafori Soro has been his Prime Minister since 29 March 2007, issuing from the political agreement signed in Ouagadougou (Burkina Faso).

³ www.cotedivoirepr.cj, 2010.

ICT Policies and Regulatory Environments in Côte d'Ivoire

Policies and Strategies

Placed under the authority of the Prime Minister, the Ministry of NICT has the task of⁴ :

- defining and proposing the best-suited ICT policy to the government ;
- ensuring the promotion and popularisation of ICT across the national territory and making it accessible to all, and the development of a competitive public postal service ;
- promoting human resources and seeing to the development of national expertise in ICT ;
- implementing an information system for administration and ensuring its monitoring ; and
- identifying the procedures to be implemented in order to stimulate the industrial development of the sector and the creation of research projects.

The Government intends to pursue the following strategies by way of the principal directives of the ICT challenge :

- to popularise ICT access ;
- to promote the use of ICT by civil society companies and organisations ;
- to make the administration a model NICT user ;
- to promote the development of a new industry of goods and services around ICT ;
- to ensure the better coordination of public and private role player initiatives in the information technology sector ; and
- to ensure the international influence of Côte d'Ivoire in ICT.

State of Play: Recent Developments and Current Projects

In terms of the vision of the accelerated growth strategy, the ICT and tele service activities should be one of the main motors of economic growth in Côte d'Ivoire by 2015, making it the driving force of the CEDEAO and the reference in Africa.

In terms of the vision of the accelerated growth strategy, the ICT and tele-service activities should be one of the main motors of economic growth in Côte d'Ivoire by 2015, thus making it the driving force of the CEDEAO and the benchmark in Africa. Considerable progress has been made in the improvement of accessibility⁵ :

- the country's sub-regional connectivity is provided by a fibre optic cable linking the country to Burkina Faso (Abidjan-Ouangolo-Niangoloko), Mali (Abidjan-Niella-Kadiolo), and Ghana (Abidjan-Aboisso-Maféré), completed by the radio-relay link (Maféré-Nauli/Ghana) ;
- the total number of subscribers increased from 247,573 fixed line subscribers to 356,503 on 31 December 2008, an increase of 44% ;
- on 21 May 2009, there were 10,500,000 mobile telephone subscribers with 3 million new subscribers in 2008 alone ;
- as for the internet, a million Ivoirians daily surf the web, giving a penetration rate of 5% ;
- also, turnover increased from 544 billion in 2007 to 682 billion in 2008 of which 82% was generated by the mobile telephone market ;
- from 1997 to 2008, 820 billion was invested by operators with 122,122,837,149,000 F CFA in 2008 alone, corresponding to 524.6% of GDP ;
- the effects of cybercrime were reduced by the implementation of a watch centre in June 2009, surveillance and the handling of threats and incidents on the information network at national level. This is done by the **Côte d'Ivoire Computer Emergency Response Team** (CI-CERT).

⁴ Ministry of NICT (2009), "Panorama des TIC en Côte d'Ivoire", Abidjan.

⁵ BAKAYOKO Hamed, « Discours à la cérémonie d'ouverture des JNTIC 2008 », 21 May 2008 ; « Discours lors des JNTIC 2009 : "La protection des enfants dans le cyberspace" », 17 May 2009.

The projects that are currently in progress include, amongst others⁶ :

- the generalisation of the universal service throughout the territory ;
- the generalisation of computing tools in the education and initiation of all citizens to ICT ;
- the drafting of a new Telecommunications Code, which is more suited to the technology and practices borne of sector-specific competition ;
- the national development plan for telemedicine ;
- collaboration with Korea on ICT projects (health, access of the population to ICT, the struggle against poverty, ICT training and research, revision of the ICT development strategy) ;
- the support of the VITIB of Grand-Bassam by a public-private partner for the development of an ICT industry, namely an incubator, centre of computer assembly services and industries, development of software and other IT equipment.
- opening up rural areas; the objective being to allow ICT access to all rural areas. It includes a fibre optics infrastructure project to cross the country. A pilot project connecting 300 villages has already begun (in 2009).

Financing is acquired and Côte d'Ivoire paid its share on 11 February 2009. In the map of the country below, the extent of the fibre optics project is shown.

This is followed by its data sheet.



KEY

	Current situation: 2,000 Km
	Future situation: 3,678 Km

Figure 1. Infrastructures of fibre optic transmission: current situation and future situation

Source : Ministry of NICT, NICT Department, June 2009

⁶ BAKAYOKO Hamed, idem.

Table 1. Data sheet of the fibre optic project

Cost of project	\$90,000,000
Finance method	Credit provider
Start-up advance	15% of the commercial contract amount (already paid)
Credit amount	85% of the commercial contract amount
Currency	American Dollar
Borrower	State of Côte d'Ivoire
Security	Yes
Credit duration	12 years of which a three year grace period
Interest rate	0.5% for all the main residuals
Repayment method	Half-yearly payment

Source: Ministry of NICT, NICT Department, June 2009

ICT Regulatory Environment in Côte d'Ivoire

Legislative and Regulatory Environment

In 1995, the State of Côte d'Ivoire refined its process of structural reform of the Telecommunications sector, which is crystallised in a Code on which preliminary work started in 1991. The objective of these works is to open this sector to private operators and to restore its productivity and competitiveness, which were undermined for a long time by state management, which is not always efficient. The Code applies to all Telecommunication companies (operating in the national territory) and to all Telecommunication activities except, however, to those from services that are placed under the authority of ministries in charge of National Defence, public security, Information and Communications (for reasons of State security and national sovereignty).

The new fundamental legislations, supporting the Telecommunications Code and contained in Act no. 95-526 of 7 July 1995, was followed by the adoption of two other acts, namely :

- **act no. 97-519 of 4 September 1997**, giving the definition and organisation of State-owned companies ; and
- **act no. 2001-339 of 14 June 2001**, instituting the payment of a financial compensation for the issue of the final licence to Telecommunication operators.

The texts and regulations governing the Telecommunications sectors in Côte d'Ivoire, apart from these three elements of law, include: decrees (11), bylaws (3) and orders (2), which are available at the ATCI and appended to the requirement specifications of operators.

Certainly, the Code of 1995 has allowed the reform of the national Telecommunications sector and its revitalisation through numerous investments, but the fact remains that it contains a fair number of legal vacuums, which are at the root of the malfunctioning and conflicts observed in this sector and depend, among other things, on :

- the lack of foresight of clauses relative to the commercial use of voice services on IP (Internet telephone) ;
- granting an exclusive right (operational monopoly until the end of the monopoly contract of ten years, which was initially anticipated in 2007) on the central transit of international calls to the incumbent operator ;
- the State's failure to set the interconnection rates stemming from the wishes of the incumbent operator (asymmetry in rates between operators linked by a synergy).

It is to remedy these concerns that a more suitable Code is being drawn up.

It is to remedy this malfunctioning that a more suitable Telecommunications Code is being drawn up.

Institutional Environment

Government

The Telecommunications Code gives the Government, through the interconnection of its Ministry, administrative control of the Ministry of New Information and Communication Technologies, which guarantees general Telecommunication principles. Said Ministry is in charge of drawing up the general policy of the government for the sector of which the tasks are listed in article four of said Code. Thus, the Government sees to it that :

- on the one hand, the regulatory functions and the monitoring of activities from the Telecommunication sector, and on the other hand, the network operation functions of the Telecommunications service provision are assured independently ;
- the provision of services that are not exclusively entrusted to a Telecommunications company are carried out under the conditions of fair competition ;
- the principle of equal treatment of all users, whatever the content of the message transmitted, be respected by all Telecommunications companies ; and
- access to the public service is provided in objective, transparent and non-discriminatory conditions.

Two independent organs under ministerial supervision (technical and financial) ensure the regulation of Telecommunications in Côte d'Ivoire. They are the ATCI (Agence des Télécommunications de Côte d'Ivoire) and the CTCI (Conseil des Télécommunications de Côte d'Ivoire).

ATCI

Instituted by the Telecommunications Code of 1995, the legal status of the ATCI underwent modification under order no. 98-441 of 4 August 1998, which made it a state-owned company on 16 September 1998. The ATCI exercises the competence, right and obligation devolved to the administration in accordance with article 51 of the Telecommunications Code. Its goals are to :

- enforce the Telecommunication regulation texts ;
- define the principles and authorise the pricing of services that are provided under the monopoly regime ;
- issue Telecommunication service operating licences ;
- award terminal equipment agreements ;
- ensure the management and control of the radio electric frequency spectrum ;
- contribute to the exercise of State tasks relating to public Defence and Security ; and
- contribute to the exercise of any other task of public interest, which the Government could give it for the State's account in the Telecommunications sector.

At the junction of its double functions, namely technical agency and Telecommunications police, the ATCI also intervenes with concessionary agreements signed between the operators and the State of Côte d'Ivoire to :

- examine complaints received from users of the concessionary's services concerning the application of requirement specifications ;
- arbitrate in a first instance the disputes between the distributor and the licensed operators ;
- monitor the implementation of concessionary agreement clauses.

Due to the size of the cybercrime phenomenon, the ATCI has undertaken various actions and studies in order to fight against it. This led to the implementation on 19 June 2009 of a watch centre, surveillance and the handling of threats and incidents on the information network on a national level. The main goal of the **Côte d'Ivoire Computer Emergency Response Team** (CI-CERT) is to fight cybercrime.

The Telecommunications Code gives the Government, through the interconnection of its Ministry, administrative control of the Ministry of New Information and Communication Technologies, which guarantees general Telecommunication principles.

At this junction, in other words that of the technical agency and the Telecommunications police, the ATCI also intervenes with concessionary agreements signed between the operators and the State of Côte d'Ivoire.

CTCI

Created by act no. 095-526 of 07 July 1995 supporting the Telecommunications Code, the CTCI (Conseil des Télécommunications de Côte d'Ivoire), an independent administrative high authority, has the following tasks in accordance with article 50 of said act :

- to see to it that the principle of equality in the treatment of operators in the Telecommunications sector is respected ;
- to see to it that the clauses contained in the concessionary agreement, the requirement specifications and the licences issued by the Administration are respected ;
- to ensure, as the first and foremost arbitral or jurisdictional recourse, the conciliation and arbitration of disputes between the Administration and Telecommunication sector operators when the Administration carries out its allocated tasks.

In its functioning, the CTCI has a semi-judicial competency. This organ is competent for the conciliation and arbitration of disputes in the sector.

In its functioning, the CTCI has a semi-judicial competency. This organ is competent for the conciliation and arbitration of disputes in the sector. Thus, it renders decisions on petitions of conflicting operators either between them or with the ATCI. These decisions are published in the official newspaper and in the majority of cases aim to restore equal treatment between operators and users.

In order to avoid conflicts of jurisdiction, which sometimes divide these two regulatory organs (ATCI and CTCI), and which hinder the proper functioning of the sector, the next Code will make provision for establishing a single regulatory organ.

FNT

The Fonds National des Télécommunications (FNT) was implemented to ensure the financing of rural telephone operation and of programmes and projects relating to ICT. Decree no. 98-625 of 11 November 1998 supports its creation and sets out the operating mode of the following tasks that have been assigned to it :

- the financing of investments to provide access to rural areas ;
- the financing of public studies, programmes and projects relating to new information and communication technologies ;
- maintaining investments financed by the fund ; and
- payment of the debt contracted by the State for rural telephone programmes.

In view of providing access to Ivorian villages, this fund has until now been financed by :

- start-up charge (2 % of the turnover of GSM operators and 1% for fixed line operators): main resource of the fund ;
- investment products of the fund.

The FNT is under the technical supervision of the Ministry of Economic Infrastructures and the Ministry of Economy and Finances. It works with two Committees. They are the Management Committee and the Technical Committee, who each have their own competencies and whose composition was established by inter-ministerial bylaws in April 2006.

Besides these public structures, there are private structures whose actions or expertise in the field of Telecommunication more or less influence the dynamic of the sector and the drawing up of legal texts. Two private groups can be considered the most active. They are UNETEL (Union Nationale des Entreprises de Télécommunications), which is a managerial association bringing together the main Telecommunication companies, and the FAC-CI (Fédération des Associations de Consommateurs de Côte d'Ivoire) presently bringing together twelve associations of which one, ACOTEL-CI (Association des Consommateurs de Télécommunications de Côte d'Ivoire), is specifically in the Telecommunications sector.

The Fonds National des Télécommunications (FNT) was implemented to ensure the financing of rural telephone operation and of programmes and projects relating to ICT.

ICT Market in Côte d'Ivoire

Market Structure and Technologies

In Côte d'Ivoire we can distinguish various types of companies that operate in the telecommunications sector, such as telephone operators (fixed and mobile), radio and television programme broadcasters, telephone service resellers, internet access providers, data transmitters, telephone equipment and IT facility distributors etc. Our analysis considers fixed and mobile telephone operators, Internet access providers, and radio and television programme broadcasters. The following tables display some data concerning the offers/services and access technologies in the telephone and Internet fields for households and companies.

Table 2. Distribution of offers according to access technologies for households

Offer	Access Technology
Fixed line telephone	RTC, CDMA
Mobile telephone	GSM, GPRS/EDGE, CDMA, 3G
Fixed internet	RTC, ADSL, BLR, WiMax
Mobile internet	CDMA, WiMax, GPRS/EDGE

Source : www.igici.ci 2010

Table 3. Distribution of services according to access technologies for companies

Service	Access Technology
Interconnection	LS Copper, Point to point link, FO, VSAT, IP MPLS, FH, BLR
Telephone	RTC, RNIS, IP
Internet	LS copper, FO, WiMax, BLR

Source : www.igici.ci 2010

Mobile Telephone Sector

Granting of Licences

In 1996, the first three licences or certificates of licence were issued by the ATCI to each of the three companies operational at the time (CORA from COMSTAR, which closed in 2004, Telecel from Loteny Telecom, which became MTN Côte d'Ivoire in 2005, and Ivoiris from SIM, which became Orange Côte d'Ivoire in 2002) for the set-up and use of a network earth cellular mobile radio communication in the 900 MHz band. These certificates of licence were issued provisionally. Currently there are only operating licences or perpetual licences or dual-band GSM 900/1800 MHz licences, which represent and signify the document issued by the ATCI to operators certifying the operator's authorisation to set up and use an earth cellular mobile radio communication network in the GSM standard in Côte d'Ivoire. The frequencies allocated to each operator are made up of 40 channels in the GSM 900 MHz band and 50 channels in the 1800 MHz frequency band. The duplex spacing between the two channels of a radio electric channel is 45 MHz for the 900 MHz band and 95 MHz for the 1800 MHz band. The duration of the operating licence is twenty years.

To date, five operators are in operations in the mobile telephone market and two having obtained their licences but have not yet started doing business. The table below summarises this situation over the 1996 to 2009 period.

To date, five operators are in operations in the mobile telephone market and two have obtained their licences but have not yet started doing business.

Table 4. Distribution of GSM dual-band licence grants in Côte d'Ivoire

	GSM Dual-band Licence Holders	Date Obtained – Duration of Licence	Start of Commercial Activity	Observations
1	MTN Côte d'Ivoire	02 April 1996 for 20 years	Since 1996	July 2005 saw a transition from Loteny Telecom (Telecel) to MTN Côte d'Ivoire, whose trade name is "Y'ello"
2	Orange Côte d'Ivoire	02 April 1996 for 20 years	Since 1996	In May 2002, Ivoiris de SIM (Société Ivoirienne de Mobile) became Orange Côte d'Ivoire whose trade name is "Orange"
3	Atlantique Telecom Côte d'Ivoire	03 June 2005 for 12 years	Since July 2006	Atlantique Telecom Côte d'Ivoire's licensed name is ACELL-CI and its trade name is "Moov"
4	Comium Côte d'Ivoire SA (CCI SA)	03 July 2006 for 20 years	Since 2007	Comium Côte d'Ivoire SA's trade name is "Koz"
5	Green Network	03 December 2005 for 10 years	Since December 2008	Green Network bought Oricel's license and its trade name is "GreenN"
6	Warid Côte d'Ivoire	15 December 2005 for 10 years	Commercially inactive to date	The licensed name of Warid Côte d'Ivoire is CELCOM
7	AIRCOMM CI	25 June 2006 for 10 years	Commercially inactive to date	-

Source : www.atci.ci; survey data 2009.

In addition to GSM (2G), the terrestrial technologies in operation in Côte d'Ivoire for the sending and receiving of data on the mobile network are GPRS (2.5G) and EDGE (2.75G) of which the use per operator is indicated in the following table.

Table 5. Distribution of GSM operators according to the terrestrial technology used and according to the licence cost

Mobile Operator	Terrestrial Technology	Licence Cost
Orange Côte d'Ivoire	GSM/GPRS	40 000 000 000 F CFA
MTN Côte d'Ivoire	GSM	40 000 000 000 F CFA
Moov Côte d'Ivoire	GSM/GPRS/EDGE	40 000 000 000 F CFA
Comium Côte d'Ivoire	GSM	30 000 000 000 F CFA
Green Network	GSM	20 000 000 000 F CFA

Source : Wikipedia, 2009; survey data.

The cost of acquiring a licence at the ATCI for the use of 900 MHz and 1800 MHz frequencies is 40 billion F CFA for the two frequencies, or 20 billion F CFA per frequency band.

Numbering Plan

In Côte d'Ivoire, the national numbering plan for mobile telephone works as follows: the numbers are made up of 8 figures in the "ABPQMCDU" format beginning with "0", "4", "5", "6" or "7", and are intended to provide interpersonal communication services from the mobile Telecommunications networks open to the public. The operator indicator on the "National Destination Code (NDC)" is given by the value of the first two figures "AB".

On 31 March 2009, the occupation of mobile service indicators is given by the table below :

Table 6. National numbering plan for mobile networks

Operator Indicator "AB"	Mobile Operator	Date of Opening (allocation 1st block)	"ABP" Blocks Allocated
Mobile service indicator "0"			
01	Atlantique Telecom CI	04 August 2005	010 to 019
02	Atlantique Telecom CI	17 December 2006	020 to 029
03	Atlantique Telecom CI	17 September 2007	010 to 019
04	MTN CI	14 December 2007	040 to 049
05	MTN CI	15 January 2000	050 to 059
06	MTN CI	17 February 2004	060 to 069
07	Orange CI	15 January 2000	070 to 079
08	Orange CI	12 March 2004	080 to 089
09	Orange CI	17 July 2006	090 to 099
Mobile service indicator "4"			
45	MTN CI	27 September 2007	450 to 459
46	MTN CI	27 March 2008	460 to 469
47	Orange CI	17 September 2007	470 to 479
48	Orange CI	17 September 2007	480 to 481
Mobile service indicator "6"			
60	Green Network	17 August 2006	600 to 601
66	Comium CI	05 April 2007	660 to 669
67	Comium CI	15 February 2008	670 to 679
69	Aircomm CI	05 June 2007	690

Source : www.atci.ci

Fixed-Line Telephone Sector

Granting of Licences

Two operators hold concessionary agreements signed with the State of Côte d'Ivoire, allowing them to provide the fixed-line service to end users as well as other operators for a period of 20 years. They are Côte d'Ivoire Telecom and Arobase Telecom.

Numbering Plan

As far as the national numbering plan of fixed lines is concerned, we speak of geographic numbers that are also intended for interpersonal communication service provision from Telecommunication networks, this time fixed lines open to the public. Geographic numbers also consist of 8 figures in the "ABPQMCDU" format beginning with "2" or "3" of which the structure contains a geographic indication, which is used to transport calls. This geographic indication is independent of the operator. The geographic area indicator is given by the value of the first two figures "AB" and the NDC is given by the value of the first three figures "ABP".

On 31 March 2009, the occupation of fixed-line service indicators is given by the table below :

Two operators hold concessionary agreements signed with the State of Côte d'Ivoire, allowing them to provide the fixed-line service to end users as well as other operators for a period of 20 years.

Table 7. Organisation of fixed telephone line service indicators

Geographic Area Indicator "AB"	Geographic Numbering Area
Abidjan region (A = 2)	
20	Plateau
21	Abidjan-sud
22	Cocody
23	Yopougon
24	Abobo
Mobile service indicator "4"	
30	Yamoussoukro
31	Bouaké
32	Daloa
33	Man
34	San-Pédro
35	Abengourou
36	Korhogo

Source : www.atci.ci

On 15 June 2009, the occupation of the national numbering plan, as far as geographic numbers are concerned, is shown in the table below :

Table 8.
National numbering plan concerning the indicators of fixed-line networks and geographic areas

Area Indicator "AB"	Operator Indicator "ABP"	Fixed-line Operator	Date of Allocation of 1st Block
Abidjan region (A = 2)			
20 (Plateau)	20 0	Arobase Telecom	16 February 2005
	20 2	Côte d'Ivoire Telecom	15 January 2000
	20 3		
21 (Abidjan-sud)	21 0	Arobase Telecom	16 February 2005
	21 2	Côte d'Ivoire Telecom	15 January 2000
	21 3		
	21 5		
	21 7		
22 (Cocody)	22 0	Arobase Telecom	15 January 2000
	22 4	Côte d'Ivoire Telecom	
	22 5		
23 (Yopougon)	23 0	Arobase Telecom	16 February 2005
	23 4	Côte d'Ivoire Telecom	15 January 2000
	23 4		
24 (Abobo)	24 0	Arobase Telecom	16 February 2005
	24 3	Côte d'Ivoire Telecom	15 January 2000
	24 4		
	24 5		
Other regions (A = 3)			
30 (Yamoussoukro)	30 6	Côte d'Ivoire Telecom	15 January 2000
31 (Bouaké)	31 6	Côte d'Ivoire Telecom	15 January 2000
	31 9		
32 (Daloa)	32 7	Côte d'Ivoire Telecom	15 January 2000
33 (Man)	33 7	Côte d'Ivoire Telecom	15 January 2000
34 (San-Pédro)	34 7	Côte d'Ivoire Telecom	15 January 2000
35 (Abengourou)	35 9	Côte d'Ivoire Telecom	15 January 2000
36 (Korhogo)	36 8	Côte d'Ivoire Telecom	15 January 2000

Source: www.atci.ci

Internet Access Provision Sector

In Côte d'Ivoire there is a single company whose economic activity consists of the transport and reception of the international teleports. That company is Côte d'Ivoire Telecom, which provides an Internet connection itself and positions itself as an IAP (Aviso). The international connection is done in two ways (underwater cables and satellites) and Côte d'Ivoire Telecom runs the first channel exclusively.

Côte d'Ivoire set up its first Internet connection in 1996. Internet bandwidth is thus transferred via the switch network of the incumbent operators via RTC (and ADSL offer) or via a specialised link. The digitisation rate of the network is 100% for message switching and 90% for transmission equipment. The RNIS network is only available in the economic capital, Abidjan.

From this descriptive, it can be seen that in general the IAPs depend on the incumbent operator for connection to the Internet backbone. Those operators who can invest in their own earth stations

From this descriptive, it can be seen that in general the IAPs depend on the incumbent operator for connection to the internet backbone.

and VSAT networks to remain independent. Clients who wish can also obtain wireless links (wireless local loop or VSAT).

There are about thirty licences of variable duration (2, 3, 5, 14 years, etc.) that are already issued by the ATCI for internet access provision.

There are about thirty licences of variable duration (2, 3, 5, 14 years etc.) that are already issued by the ATCI for internet access provision. Below are the main IAPs in operations and identified by the ATCI who offer this bandwidth for sale, which they buy from the incumbent provider.

Table 9. Summary of the active licence holding IAPs in Côte d'Ivoire

	Internet Licence Holders	Notification Receipt Nr	Date of Issue
1	AFNET	07/NET/3/96/ATCI	30 December 1997
2	AFRICA ONLINE	01/NET/3/96/ATCI	20 August 1996
3	AFRIQUE TECHNOLOGIES & SERVICES (VIPNET)	27/NET/4/03/ATCI	03 November 2003
4	ALINK TELECOM (AFRIPA TELECOM)	40/NET/1/06/ATCI	8 February 2006
5	AROBASE TELECOM	45/NET/07/ATCI	15 February 2007
6	AVISO		
7	COTE D'IVOIRE MULTI MEDIA (CI2M)	25/NET/4/03/ATCI	03 November 2003
8	I-VILLAGE	18/NET/1/03/ATCI	21 March 2003
9	I2S2	19/NET/2/03/ATCI	29 April 2003
10	OST-CI	21/NET/2/03/ATCI	29 April 2003
11	POWERLINE COMMUNICATIONS CI	22/NET/2/03/ATCI	29 April 2003

Source: www.atci.ci

IAP licences remain provisional. The company AVISO dominates this sector and the companies are private law companies, held by natural and physical persons of private law.

The capital of the Arobase Telecom companies (fixed and IAP) and AFNET is entirely held by the MTN CI company.

The international bandwidth (33 Mb/s) is saturated and thus plans to increase it to 45 Mb/s were formulated in 2004. This bandwidth is that which Côte d'Ivoire Telecom offers to IAPs on its access to SAT-3 cable. Côte d'Ivoire is connected to the Internet by the Leland node (512 Kb/s) and the SAT-3 cable (33 Mb/s) in international output towards the Internet backbone. The figure below indicates the terminal countries served by SAT-3.



Figure 2. Pays Terminaux desservis par le SAT-3/WASC/SAFE

Source: www.safe-sat3.co.za

On the basis of information gathered, certain IAPs connect in the following way :

- For AFNET: a bandwidth of 6 Mb/s input and 4 output; work with free Linux software; use the international link of Côte d'Ivoire Telecom (ADSL); use CDMA, WiMax and Pre WiMax ;
- For AVISO: similar characteristics in bandwidth (use about 16 Mb/s on the SAT-3 bandwidth this via AGSL) ;
- For AFRICA ONLINE: a bandwidth of about 2 Mb/s on SAT-3; following the example of all the other IAPs, uses radio links.

VSAT is the "back-up" solution and is used by all the IAPs in the case of problems with other technological supports. The mobile network Atlantique Telecom uses its VSAT directly to access the Internet backbone.

Apart from the SAT-3 cable, Côte d'Ivoire is linked to the world by T2 links (specialised links offering high speeds between Côte d'Ivoire and France).

The number of subscribers for all the IAPs in 2009 was 40,000 for ADSL.

It has to be noted that today there is no national IP network with a backbone in Côte d'Ivoire.

Television Broadcasting Sector

The CNCA (Conseil National de la Communication Audiovisuelle) is the regulation authority for the audiovisual sector (television and radio only) in Côte d'Ivoire. The Radiodiffusion-Télévision Ivoirienne (RTI) is the radio phonic and audiovisual broadcasting organism in the Ivoirian State. There are two big public television channels brought together at the RTI entity. It includes La Première (national broadcasting) and TV2 (broadcasting in the 150 km around Abidjan). They respectively offer an average of 10 to 13 hours and 6 to 8 hours of daily programming each. In the same RTI group, there are two television channels, RTI Music TV and RTI Sport TV, an analogue broadcast on Channel 1 and 2. The RTI also runs a network of two radio stations (Radio Côte d'Ivoire and Fréquence 2) covering the whole national territory.

As for private channels, there are various radio (broadcasting following the example of State radios in frequency modulation) as well as television channels.

Radio Stations

State Radio

Radio Côte d'Ivoire

Radio Côte d'Ivoire is part of the RTI group. It is a non-specialised station with national and regional themes and produces 133 hours of programming weekly, with priority given to regional news and programmes in national languages as well as to religious and service programmes. The national station is more oriented towards institutional news while also keeping in mind the needs of listeners across the general public through programmes and debates on news, society, politics, economy and culture.

Fréquence 2

Fréquence 2 is the other radio station comprising the RTI group and was created on 11 November 1991. Fréquence 2 is a channel that centres on themes of leisure, entertainment and relaxations and, which broadcasts 147 hours of programming weekly. Its audience is mainly the youth. The programmes are divided into slots of programmes, which do not last longer than 30 minutes. Fréquence 2 targets a younger audience who wants to be entertained. Its programming essentially consists of magazines and musical broadcasts.

The two national radio channels cover the whole territory with frequencies peculiar to each big town. They broadcast in FM 24/7 and synchronise their broadcasted news programmes from around 10 pm until 8 am.

Private Radios

Other than these state radio stations, there are private stations of commercial nature (of which the advertising resources can exceed 20% of turnover) or non-commercial nature. The pervasiveness of

private non-commercial radios, in other words those whose advertising resource share in the budget, is less than 20%, and consist of local radios, rural local radios, institutional or foreign radios, school radios and denominational radios.

On 11 March 2007, the CNCA listed 94 radio licence holders, which included :

- two State radios ;
- sixty-nine local radios (private non commercial) ;
- three private commercial radios ;
- five institutional radios ;
- seven denominational radios ; and
- seven rural local radios.

Television Channels

State Channels

La Première

La Première is the public Ivoirian non-specialised television channel, which broadcasts continuously from Abidjan. It is a State-owned company belonging to the RTI group and held 100% by the Ivoirian State. **La Première** is under the double political and financial supervision of the Ministry of Communication and of Economy and Finance with a capital of 6 billion F CFA in 2006. It offers diverse programming intended to reach a large audience. This position assigns it the purpose to play a major role in the field of national and international news, of creation, of entertainment and of events. The RTI is a partner of Canal France International (CFI) and certain programmes on **La Première** come from the programme bank of CFI and 97.71% of its programmes are presented in French compared to 2.29% in local languages.

La Première is broadcast nationally over various earth radio link transmitters that are put up in Abidjan, Divo, Bouaflé, Man, Séguéla, Bouaké and Dabakala. It is also available directly in the world via the Internet through the site Abidjan.net (link: RTI Live 24/24), on the African Bouquet of Neuf Telecom (Neuf TV, channel 448) since October 2008, on Free Telecom (Freebox TV, channel 261) since May 2009 and 24h/7 on the site *abweb.com*.

TV2

The second State television channel, **TV2**, was initiated on 9 December 1983, under the name of Canal 2. It was at first a very small channel with no advertising or news, which only broadcasted two days a week (Tuesday and Friday from 8:30 pm) in a radius of 50km around Abidjan. Named **TV2** on 1 November 1991, the channel became a thematic local channel, which broadcasts everyday on a reception area enlarged to 150km around Abidjan. Its programmes are centred on entertainment (soaps, entertainment programmes, animations, films, music videos), but it also broadcasts magazines all directed on the premises of the **La Première** channel.

RTI Music TV and RTI Sport TV

RTI Music TV is a musical television channel in the RTI group and is only available in the morning on channel 1 and in the early afternoon on channel 2.

RTI Sport TV is a television channel in the RTI group and following the example of **RTI Music TV**, is exclusively dedicated to the operation and of sporting events and is often available on weekend or during important sporting events on channel 1 and channel 2.

Private Channels

Canal+ Horizons is the only private television channel to broadcast on the radio link network of Abidjan (since 21 January 1994). It is a subsidiary of Canal+ and Canal+ Horizons following the same concept of programming as that of Canal+, and relaying their signal completely (none of its own productions or local broadcasts). TV5MONDE is additionally offered to Canal+ Horizons subscribers but can be received directly. The television channels of the French language satellite bouquet "Le Sat" are received in Abidjan thanks to an MMDS antenna: TV5 Afrique, RTL9, TiJi,

Mangas, Euronews, Planète, etc. An audio offer allows free access to a few radio programmes (RFI, BBC, Africa N°1, etc.), which can be listened to on television set speakers or on a hi-fi connected to the digital terminal. A few national promoters have presented diverse private television projects to the CNCA, the only one of which to be validated being **TAM-TAM TV**.

TAM-TAM TV is the first Ivorian private television channel and was officially launched on 1 May 2008. It is a non-specialised digital satellite television channel dedicated to Africa. It is the leading international Ivorian channel and covers Europe, North Africa, the Middle East, sub-Saharan Africa, Asia and America, coverage of 171 million households in more than 200 countries. **TAM-TAM TV** was created in collaboration with certain European partners. It has offices in various countries, notably in Italy, France, the US, China and Switzerland. Its headquarters are located in Cocody (Abidjan). The completion of this project has necessitated an investment of 50 billion F CFA⁷.

Certain television channels and Ivorian radio stations are also available on the Internet, e.g. *Abidjan.net* TV, Bengueshow, etc.

Coverage and Revenues of the Telephone Market

Coverage

Table 10. Distribution of telephone coverage (subscribers) from 2005 to 2008

	2005	2006	2007	2008
Fixed Network	258 515	270 573	247 573	356 502
GSM Network	2 349 439	4 065 421	7 467 708	10 449 036
Total	2 607 954	4 335 994	7 715 281	10 805 538

Source : www.atci.ci

The telephone network experience has experienced a dazzling rise in terms of the number of subscribers since 2005. It has increased from nearly 3,000,000 subscribers in 2005 to about 11,000,000 subscribers in 2008, which is a development rate of 414%. The GSM network alone recorded close to 97% of telephone subscribers in 2008.

The telephone network experienced a dazzling rise in terms of the number of subscribers since 2005. It has increased from nearly 3,000,000 subscribers in 2005 to about 11,000,000 subscribers in 2008, which is a development rate of 414%.

Table 11. Distribution of GSM operators according to the number of subscribers from 2005 to 2008

	2005	2006	2007	2008
MTN Côte d'Ivoire	1 079 462	1 625 408	2 678 678	3 562 294
Orange Côte d'Ivoire	1 269 977	1 754 688	2 860 407	4 142 806
Moov Côte d'Ivoire	-	685 325	1 324 338	1 840 480
Comium Côte d'Ivoire	-	-	604 285	903 456
Total	2 349 439	4 065 421	7 467 708	10 449 036

Source : www.atci.ci

In 2008, Orange CI took the lead in GSM operators in terms of subscribers (4,142,806 subscribers or 39.65% of market share) followed by MTN CI (3,562,294 subscribers or 34.10% of market share). From 2007 to 2008, the international growth rate of the number of subscribers was 44.83% for Orange CI, 32.99% for MTN CI, 38.97% for Moov CI and 49.50% for Comium CI.

⁷ www.wikipedia.org

Revenues

Table 12. Distribution of turnover (in F CFA) per telephone operator from 2005 to 2008

	2005	2006	2007	2008
MTN Côte d'Ivoire	121 679 652 000	132 000 640 000	159 788 070 000	188 798 072 000
Orange Côte d'Ivoire	158 192 146 000	191 142 356 000	188 982 551 000	209 402 332 000
Moov Côte d'Ivoire	-	17 117 550 000	70 868 449 000	98 956 432 000
Comium Côte d'Ivoire	-	-	7 392 468 000	56 754 097 000
Côte d'Ivoire Telecom	105 114 000 000	107 343 000 000	117 192 000 000	127 994 000 000
Total	384 985 798 000	447 603 546 000	544 223 538 000	681 904 933 000

Source: www.atci.ci

The turnover of the telephone sector has been increasing by about 100 billion F CFA each year since 2005. From 2005 to 2008, Orange Côte d'Ivoire was the biggest operator in terms of turnover.

The turnover of the telephone sector has been increasing with about 100 billion F CFA each year since 2005. From 2005 to 2008, Orange Côte d'Ivoire was the biggest operator in terms of turnover. Moov Côte d'Ivoire and Comium Côte d'Ivoire only appeared on the mobile telephone market in 2006 and 2007 respectively.

Investments and Employment in the Telephone Market

Investments

Table 13. Distribution of investments (in F CFA) per telephone operator from 2005 to 2008

	2005	2006	2007	2008
MTN Côte d'Ivoire	23 276 287 000	21 901 965 000	22 083 220 000	43 487 956 000
Orange Côte d'Ivoire	23 200 723 000	47 228 057 000	34 522 098 000	49 447 868 000
Moov Côte d'Ivoire	-	70 056 029 000	45 459 068 000	18 931 253 000
Comium Côte d'Ivoire	-	-	67 984 379 000	10 970 072 000
Côte d'Ivoire Telecom	7 000 000 000	10 426 000 000	11 448 000 000	-
Total	53 477 010 000	149 612 051 000	181 496 765 000	122 837 149 000

Source: www.atci.ci

Since the end of the duopoly in the mobile telephone sector in 2006, investments in the field of telephony amounted to hundreds of thousands per year.

Employment

Table 14. Distribution of employment per telephone operators from 2005 to 2008

	2005	2006	2007	2008
MTN Côte d'Ivoire	597	576	570	605
Orange Côte d'Ivoire	613	710	723	726
Moov Côte d'Ivoire	-	406	463	450
Comium Côte d'Ivoire	-	-	285	326
Côte d'Ivoire Telecom	1 206	1 223	1 225	1 199
Total	2 416	2 915	3 266	3 306

Source: www.atci.ci

Direct job offers in the telephone sector have been increasing considerably since 2005. In 2008, more than 3,300 direct jobs were offered. Two operators have even initiated employment incentive programmes.

MTN CI, through its **MTN Career Day** programme, which was held on 10 October 2007, devoted itself to a major recruitment exercise (55 positions) in various fields. In the same framework, a partnership between Orange CI and l'Agence d'Étude et de Promotion de l'Emploi (AGEPE), became a reality on 29 May 2009. The objective of this programme is to adapt the job applications to Orange CI's offers with 80 internships of 100,000 F CFA each for a duration of six (06) months, renewable once.

Direct job offers in the telephone sector have been increasing considerably since 2005.

Billing of the Use of ICT in Côte d'Ivoire

Pricing concerns all the rules laid down by the telecommunications operator to bill the provision of services rendered to its clients. The charging method takes on the flat rate fees or else varies according to service repetition. The price of communications made is based on distance, duration, time and day of the call for mobile and fixed telephones.

As for Internet access provision, the prices charged essentially depend on the speed subscribed to which the services are pertaining to and according to the subscription period (subscription option).

The operators themselves set prices. The regulatory organ (ATCI) plays the role of arbitrator, keeping in mind consumer interests. The ATCI is in the study phase of a price model project based on the investments, which will be imposed on all the operators intervening in the same market segment for joint provision.

All in all, the operators themselves set prices. The regulatory organ (ATCI) simply plays the role of arbitrator, keeping in mind consumer interests. For the same mobile telephone service, for example, the difference between the prices is sometimes very large. To level this type of situation, which tends to weaken competition, the ATCI is in the study phase of a price model project based on the investments, which will be imposed on all the operators intervening in the same market segment for joint provision.

Mobile Telephone Rates

As for prepaid offers, successive rate changes have allowed offers to be placed on the market intended for people of modest income (recharges of 200 F CFA, 500 F CFA) in addition to traditional prepaid recharges (1,000 F CFA, 2,500 F CFA, 5,000 F CFA, 10,000 F CFA, 25,000 F CFA, 50,000 F CFA, 100,000 F CFA). It should be noted that there is a diversification of rate plans associated with each type of recharge in the measure, where the billing is, henceforth, done in slices of 15 and 20 seconds instead of per indivisible minute, then per second.

Concerning post-paid offers, the monthly charge was removed in 2006 to the benefit of flat rates per subscription option. The communication rates per minute vary between 95 F CFA and 150 F CFA (intra network calls) and between 95 F CFA and 270 F CFA (inter-network calls).

For each of the GSM networks, apart from GreenN, there is a rate system of free intra-network minutes and messages (SMS, MMS). All these GSM networks use Thuraya technology for the international satellite transmission of their data via 2.5G, EDGE and GPRS.

Entering into operation in December 2008, GreenN offers the option of changing the rate plan between per minute and per second. This allows the subscribers to choose the billing method, which best corresponds to his communication habits. The subscriber can transfer from one pricing to another according to his wishes for all the recharges used and his unused minutes are renewable on the following recharge, unless his account is deactivated.

Fixed-Line Telephone Rates

At Côte d'Ivoire Telecom, the heavy traffic line, in other words with contract subscription, allows to benefit from a telephone line in order to make and receive national and international calls.

The Pro package offers monthly hourly volumes to Professional Clients to fixed lines, mobile and international destinations. It allows for better control and optimal management of the communication budget and consists of three flat rates :

- Pro F 25 package: three hours to fixed lines and two hours to mobiles ;
- Pro F 50 package: seven to fixed lines and four hours to mobiles ;
- Pro F 80 package: eight to fixed lines, five hours to mobiles and two hours internationally.

As for prepaid offers, successive rate changes have allowed offers to be placed on the market for people of modest income.

The prepaid solution Fidelis designates a prepaid telephone account with billing and without monthly subscription fees. Communications on this solution are made by means of a widened range of recharges from 2.500 F CFA to 100.000 F CFA.

Apart from the Fidelis solution, there is the other prepaid solutions, Contact, which is a nameless card usable on all Côte d'Ivoire Telecom telephone sets available in three (03) recharge types: 2.000 F CFA, 5,000 F CFA and 10,000 F CFA.

Arobase Telecom rests its rate strategy on rather low rates for intra-network calls (25 F CFA excluding tax per minute, which is about 30 F CFA including tax) for prepaid subscribers and present multiple offers (video, internet, electronic surveillance, etc.) to its clients. The performance

of its CDMA technology (wireless fixed line), which only entered into the market in March 2010, necessitates the same enormous investments but offers certain mobility to subscribers.

Internet Access Provision Rates

The structure of prices of Internet access provision on the market is determined by the nature of the different operational offers. This involves access speed (RTC modem, wireless or ADSL) and subscription options (limited or unlimited, prepaid or post-paid). These days, offers have diversified and rates have stabilised around 20,000 F CFA per 256 Kb. In addition to these rates, there are diverse activation fees and the purchase of additional equipment (modem, router, etc.). The table below presents some rate offers of the two main IAPs.

Table 15. Pricing of the internet connection for individuals according to the two big IAPs

		AVISO	AFNET
Monthly price for 256 Kb		20 000 F CFA	20 000 F CFA
Monthly price for 512 Kb		30 000 F CFA	42 000 F CFA
Fixed rate per month for unlimited use		20 000 F CFA (256 Kb) 30 000 F CFA (512 Kb) 45 000 F CFA (1 Gb)	23 600 F CFA (256 Kb) 53 100 F CFA (512 Kb) 112 100 F CFA (1 Gb)
Monthly subscription to the narrow band		10 000 F CFA	32 450 F CFA
Switch Modem	Rate in peak hours	41 F CFA /mn	-
	Rate in off peak hours	35 F CFA /mn	-
	Monthly subscription	45 000 F CFA	-

Source: Internet access provider, 2010.

The cost of Internet access still remains very high for very low bandwidth while speed and quality are not always guaranteed.

Interconnection Costs

The manager of telephone networks in Côte d'Ivoire negotiates an interconnection agreement with the other licensed operators, which takes the form of a contract that specifies the technical, financial and administrative conditions of interconnection. This contract, which is freely negotiated between the parties, is submitted to the ATCI for approval before it is signed. Below is the table of interconnection agreements between operators, which were approved by the ATCI in 2009.

The cost of internet access still remains very high for a very low bandwidth, while speed and quality are not always guaranteed.

Table 16. Interconnection agreements between operators approved by the ATCI in 2009

Operator	Interconnection Agreement With	Date of the Interconnection Agreement	Date of Approval from the ATCI
MTN Côte d'Ivoire	Comium Côte d'Ivoire	3 February 2009	4 February 2009
	Green Network	3 February 2009	4 February 2009
	Atlantique Telecom Côte d'Ivoire	3 February 2009	11 February 2009
	Warid Côte d'Ivoire	-	26 March 2009
	Arobase Telecom	-	26 March 2009
Orange Côte d'Ivoire	MTN Côte d'Ivoire	-	16 June 2009
	Comium Côte d'Ivoire	-	16 June 2009
	Arobase Telecom	-	16 June 2009
	Green Network	-	16 June 2009
	Côte d'Ivoire Telecom	-	16 June 2009
Atlantique Telecom Côte d'Ivoire	Comium Côte d'Ivoire	28 January 2009	2 February 2009
	Green Network	28 January 2009	2 February 2009
	Warid Côte d'Ivoire	28 January 2009	2 February 2009
Comium Côte d'Ivoire	Warid Côte d'Ivoire	28 January 2009	2 February 2009
	Green Network	14 January 2009	2 February 2009
Warid Côte d'Ivoire	Green Network	15 January 2009	2 February 2009
Côte d'Ivoire Telecom	Orange Côte d'Ivoire	-	16 June 2009
	Comium Côte d'Ivoire	-	16 June 2009
	Warid Côte d'Ivoire	-	16 June 2009
	Green Network	-	16 June 2009

Source: www.atci.ci

If the contract is freely negotiated between the licensed operators and concessionaries, it must, however, respect the principle of orientation of rates towards interconnection costs that are based on the incremental cost on long term/exchanges in the mode of "conservation". Below are the details of the different termination rates.

Table 17. Interconnection termination rates

	Termination Rate	
Mobile to Mobile	Peak hours	45 FCFA excl tax/minute
	Off peak hours	45 FCFA excl tax/ minute
Mobile to Fixed Line	Peak hours	45 FCFA excl tax/ minute
	Off peak hours	45 FCFA excl tax/ minute
International to Mobile	Peak hours	20 FCFA excl tax/ minute
	Off peak hours	20 FCFA excl tax/ minute
Mobile to International	Peak hours	45 FCFA excl tax/ minute
	Off peak hours	45 FCFA excl tax/ minute
SMS	25 CFA excl tax/ minute	
MMS	25 CFA excl tax/ minute	

Source: www.atci.ci

The termination rates are symmetrical between the mobile and fixed-line networks.

ICT: Electronic Applications and GSM Network Services

Electronic Applications

The bridging of two big entities in the digital world has disrupted the economic environment of Côte d'Ivoire to a high degree. Mobile telephones and banking have mixed in the configuration of new hybrid services with the intention of offering alternative payment methods to the handling of cash and entering bank details. We are going to review the two models currently in Côte d'Ivoire, that is to say M-payment and M-banking.

M-payment

M-payment entails the payment of a product or service by means of a mobile payment terminal, generally a portable telephone or a PDA. It also includes any financial transaction made with the help of a portable telephone. The fruit of a new economic culture based on the principles of accelerations, dematerialisation and computerisation of exchanges, M-payment in Côte d'Ivoire is this transformative model in which the product targets people who do not have a bank account, for example Orange money linked to the BICICI and MTN Mobile Money linked to the SGBCI

Orange Money was launched in July 2008 in Côte d'Ivoire. The country is, thus, the third African country to benefit from this type of service, which contributes to the improvement of banking services. It is a service that allows carrying out M-payment operations from an Orange mobile, such as transfer of money, purchase of telephone credit, account management with the option of making withdrawals and money deposits.

Following Orange Côte d'Ivoire, the result of a joint venture with SGBCI, MTN Côte d'Ivoire has its own mobile banking service (**MTN Mobile Money**). Described as a complementary solution to the banking offer, it allows the sending of money, buying of communication credit and paying bills from an MTN mobile.

The option of credit transfer is the major element of attraction for clients in all the above-mentioned networks. For the senders and receivers of money, it not only constitutes a more comfortable and secure (access code) means of payments, but is also especially accessible to the great majority of the population. This service is one of the bases of the M-banking activity. Deposits and withdrawals are made in a service agency or at the affiliated reseller.

M-banking

The companies have chosen to invest in M-banking service, keeping in mind the economic issues which result. The banking rate is 5% while the country experiences a very high growth rate for the mobile sector. Thanks to mobile telephones, this situation makes possible access to larger financial services such as bank accounts or the transfer of money between accounts. For the moment, a uniform M-banking system has not yet been set up. Each company defines its functions according to its constraints.

These days, to develop their activities, banks make appeal to mobile telephone operators covering a sub-territory since they do not have the tools to develop a telephone network themselves. In the same ways, operators wishing to increase their offer with an M-banking activity have until now had a tendency to make appeal to a bank in order to run the financial and banking aspects, even though certain operators develop their banking systems themselves. Working in collaboration with a bank allows the operator to avoid banking hassles and to take advantage of its installations, such as debit cards, which offer a very large range of choice and services in the market where credit cards and ATMs are widespread.

Access to these different payment methods is done, according to the service, by surcharge SMS or with the help of a dynamic navigational menu integrated in the portable telephone (**Java applet**), and which serves as a client interface.

The bridging of two big entities in the digital world has disrupted the economic environment of Côte d'Ivoire to a large degree. Mobile telephones and banking have mixed in the configuration of new hybrid services with the intention of offering alternative payment methods to the handling of cash and entering bank details.

The banking rate is 5% while the country experiences a very high growth rate in the mobile sector. Thanks to mobile telephones, financial services such as bank accounts or the transfer of money between accounts are possible.

In Côte d'Ivoire, we find a technological innovation carried out in this service through the link for connecting these two entities of different natures (mobile systems and banking systems). Bank and mobile convergence is only made possible by Switches such as eTranzact, which is an account manager. It runs the connection and the payment solution between the operator, the bank and the content provider. This mobile payment solution allows the payment for purchases (telephone credit, show tickets, medicine, service stations, drinks, supermarkets, gas, electricity, and rent) at shops equipped with a terminal and which state: "eTranzact cards accepted here". This solution also gives the option of transferring money to another eTranzact bank card holder and to check the balance of his eTranzact bank card.

GSM Network Services

Apart from the price battles, it is the national service, following the example of electronic applications, that the GSM operators compete for at the moment.

The mobile telephone world in Côte d'Ivoire is effervescent, to the delight of subscribers. Apart from the price battles, it is the national service, following the example of electronic applications, that the GSM operators compete for at the moment. Below are the details of a few main services.

Mobile Internet

Mobile Internet comprises all the technologies intended to access the internet by means of a mobile terminal. Its development increased globally at the beginning of 2000 with WAP applications.

In Côte d'Ivoire, all mobile operators have 2.5G mobile Internet infrastructures: GPRS and EDGE. The maximum speed reaches 100 Kb/s in practice. The Ivorian market does not yet have high-speed mobile Internet infrastructures. Only MTN CI has started to launch WiMax offers. The ATCI is busy launching calls for tender to grant 3G licences.

In addition, as far as services are concerned, mobile Internet does not really exist on a general public level. One operator (MTN CI) began to offer Facebook on the iPhone terminals that it distributes. The "company" market, certainly more dynamic, is still in the beginning stages. **Blackberry** offers "push mail" that is marketed today by operators such as Moov CI and MTN CI. It also has to be noted that mobile "Surf" with offers of USB keys marketed by Comium CI, Moov CI and MTN CI, allows internet access on the move.

The Ivorian population are consumers of high range terminals and smartphones, even if we do not have official figures concerning the whole market. "Internet centric" terminals such as iPhone, Palm and Blackberry are not foreign anymore, even if the functionality of these devices remains locally underused due to a lack of applications and bandwidth in wireless infrastructures.

All in all, the mobile Internet market in Côte d'Ivoire is still in an embryonic stage.

Virtual Recharging or e-Recharge

Virtual recharging by means of recharge cards or e-recharge consists in the client recharging his call account without having to scratch a card and without dialling 14 figures. It is a new method of recharging which does not require a physical card. This new product offers advantages at the same time to clients, distributors and to the operator (absence of recharge production costs). The service is in a way an industrialisation of the unit transfer method.

At MTN Côte d'Ivoire, the service is called "MTN Top Recharge". In this procedure, MTN Côte d'Ivoire supplies to the authorised distributors, to whom the "MTN Top Recharge" cards are given. These distributors, who are linked by a network, then supply the different points of sale or where clients will go to pay their virtual recharges.

At Orange Côte d'Ivoire, e-recharge is made available from "secure servers" from where the recharge cards are distributed to authorised distributors.

It is the same procedure at Koz and Moov Côte d'Ivoire where the service is called e-moov, while at GreenN, e-recharge has not yet been announced.

The difference between physical recharge cards and virtual recharging is that virtual recharging offers a large choice of transfer amounts and allows users to take advantage of a bonus of fluctuating amounts in accordance with, on the one hand, the recharge amounts, and on the other hand, with the operators.

Back-up of SIM Contacts

The back-up of the SIM contacts allows the user to keep all his numbers on a new or old chip. More specifically :

- his contacts saved in his SIM address book are backed up in complete security and confidentiality on the GSM operator's server ;
- in the case of loss or theft of the telephone, his contacts are returned and copied onto his new chip ; and
- he can synchronise and update his contacts at any moment (add, delete, edit)

At Orange Côte d'Ivoire, to take advantage of this service, subscribers have to replace their SIM card with another card with a bigger capacity and the integrated application "Contact Backup". Applications can be made in one of its agencies.

At MTN Côte d'Ivoire, the service is only accessible with "MTN Backup" SIM cards. The subscriber subscribes to the service by going to an MTN agency and by carrying out :

- either a SIM card replacement (if he already has an MTN number). The subscriber will keep his number, contacts and the credit associated with his accounts ; or
- the purchase of an "MTN Backup" kit, if he did not have an MTN number before.

At Moov Côte d'Ivoire, the application "Moovsauvegarde" is possible thanks to the use of SyncML protocol (standard protocol in the mobile telephone industry and supported by all the telephone manufacturers). The platform of Moovsauvegarde to backup contacts used in the synchronisation function, which is integrated in the telephone. This function is configured with the necessary parameters for the synchronisation with the **Moovsim backup** server. The configuration process is done automatically through reception of the parameters via SMS or by manually entering these parameters oneself. Once the backup has been made, the user can see and modify his data on the web portal at www.moovsauvegarde.com. Moovsauvegarde is not limited to a single device, meaning that a user can use as many telephones with the same account as he wants.

At Koz and GreenN, nothing has been announced yet

Voice Services

Voice SMS is a message dictated on a mobile, which will be transmitted to a receiver in text format in the form of an SMS. The Push To Talk (PTT) principle consists of using one telephone like a walkie-talkie, simply pushing a button to talk with another. The technology is meant to be the voice equivalent of the SMS. PTT allows the transmission of voice messages between mobile users on data networks. The user selects one or more correspondents from his contacts, and then presses a button on his terminal to record his voice message. The message is then encoded and sent via IP packet on the cellular network. It is then possible, either to let the telephone ring in order to read the voice message when the person picks up or to leave the message directly in the voice mail without letting the telephone ring and, thus, without disturbing the contact.

At Koz, "KoZ\Vocal" allows the remote recharge of an account for free, to suspend a number in the case of loss, or to manage personal options. "KoZ'Express" allows the user to record and send personalised voice SMSs via Koz voice SMS messaging to another KoZ client.

At Moov Côte d'Ivoire, as at the other GSM, this service allows the user to directly leave a message in the voice mail of a subscriber without calling them, even when the mobile is switched off or out of network.

Apart from these main services there are others, of which the details are given in the table below :

Table 18. Distribution of other services according to the mobile networks in Côte d'Ivoire

Mobile Network	Other Services
Moov Côte d'Ivoire	Moovpush mail (business mails), MMS, Data and Internet, voice mail, Moovroaming, service calls
MTN Côte d'Ivoire	Mobile TV, SMS/MMS Pro, Standard mobile, Mix Pro/Mix Perso, Zero facebook, Home Zone, Voice Chat, MTN Loaded, Bip me, MTN SMS Job, Credit transfer, MTN Zik, MTN Zone, service calls
GreenN	Credit transfer and conversion (voice, SMS, data, MMS), WAP, MMS, Web/GPRS, service calls
Comium Côte d'Ivoire	Call me back, Credit transfer, Roaming (national and international), value added services (Birthdays, tell me, dreams, love compatibility, games, com'hit, horoscope, images and ring tone, MMS videos/photos, sports, news)
Orange Côte d'Ivoire	Voice mail, funtones, fotochat, MMS, SMS chat, service calls, Orange zone, credit transfer, roaming

Source: GSM operators, 2010.

Contribution of ICT to the Ivoirian Economy

For a long time, ICT were confined to functioning only as a service tool for other activity sectors, and they were not often considered a productive sector in the same light as industry, agriculture or other service activities such as banking and transport. Since recently, due to the benefit of transformations intervening in the global economy and companies, we notice that has taken on an increasingly important share in the formation of GDP and in job creation. Telecommunications are no longer simply structuring technologies (in other words in the service of other sectors of activity); they are also diffusing technologies (in other words they create economic progress, employment and, therefore, development). The brief review of a typology of telecommunication activities (supra 3.1) informs us that in Côte d'Ivoire there is a rather wide range of telecommunication activities. This variety of activities already appears as a good indicator of the relative economic importance of this sector. Moreover, the Institut National de la Statistique (INS) considered that telephone operators, for example, make up a part of big national companies in terms of turnover and number of employees.

Telecommunications are no longer simply structuring technologies (in other words in the service of other sectors of activity); they are also diffusing technologies (in other words they create economic progress, employment and, therefore, development).

Table 19. Turnover (F CFA) of telephone operators from 2005 to 2008

	2005	2006	2007	2008
Mobile telephones	279 891 791 000	340 260 546 000	427 031 538 000	553 910 933 000
Fixed telephones	105 114 000 000	107 343 000 000	117 192 000 000	127 994 000 000
Total	385 005 791 000	447 603 546 000	544 223 538 000	681 904 933 000

Source: www.atci.ci

Table 20. Turnover of private sector companies in 2007

Companies	Turnover (in FCFA) ⁹	National Classification
Telephone sectors	544 223 538 000	-
Société Ivoirienne de Raffinage (SIR)	1 217 598 301 101	1 st
PETROCI	155 716 338 381	7 th
Unilever Côte d'Ivoire	139 924 670 536	10 th
Industrial Promotion Services (IPS)	121 385 595 130	12 th
SIFCA Group (Sucrivoire, Cosmivoire, SAPH, Sodima, etc.)	275 262 660 554	-

Source: www.jeuneafrique.com/Articleimp_ARTJAHS_500_p146-147.xml0

The telephone sector features among the leading sectors on the list of main Ivoirian companies. Orange Côte d'Ivoire, the South African subsidiary of MTN as well as Côte d'Ivoire Telecom feature among the ten leading companies of the country. With 424 million dollars in turnover for a profit of 70 million, the French subsidiary of Orange held the leading position amongst telephone operators in 2007.

The telephone sector features among the leading sectors on the list of main Ivoirian companies.

The analysis of the employment situation contained in the table below allows us to define the contribution of telephone operators to the employability of the private sector.

⁹ The data was converted from USD into F CFA on 18 June 2010; 1 USD = 529,620 F CFA.

Table 21. Share of the telephone industry in employment in the private sector from 2005 to 2007

		2005	2006	2007
Total of private sector salaried workers		191 164	202 194	207 311
Telephone employees		2416	2915	3266
	Mobile	1210	1692	2041
	Fixed line	1206	1223	1225
Share of telephone sector		1,3%	1,4%	1,6%

Source: INS & ATCI, 2010.

The contribution of these telephone operators to employment in the private sector is undergoing strong growth. From 1.3% in 2005, this contribution was 1.6% in 2007. The sector offered more than 3,300 direct jobs in 2008, without counting indirect jobs (which are more numerous) concerning infrastructure construction companies, security firms and telephone booths.

Table 22. Average turnover per employee of the telephone sector

	2005	2006	2007	2008
MTN Côte d'Ivoire	203 818 513	229 167 778	280 329 947	312 062 929
Orange Côte d'Ivoire	258 062 228	269 214 586	261 386 654	288 432 964
Moov Côte d'Ivoire	-	42 161 453	153 063 605	219 903 182
Comium Côte d'Ivoire	-	-	25 938 484	174 092 322
Côte d'Ivoire Telecom	87 159 204	87 770 237	95 666 939	106 750 626
General average turnover	183 013 315	157 078 514	163 277 126	220 248 405

Source: www.atci.ci

As a productive sector, telecommunications directly concern added value. For the moment, this contribution remains relatively marginal, but it is increasing sharply and has a notable influence on GDP growth (from 1.71% in 2000, it represented more than 6% of GDP in 2009). This contribution to the GDP still proves weak if we compare it to the results observed in certain African countries or in industrialised countries.

Table 23. Compared share of ICT in GDP of a few States

States	Share of ICT in the GDP	Years
Morocco	7%	2007
Senegal	7%	2007
Tunisia	9%	2007
France	5,3%	1997-1998
Japan	5,8%	1997-1998
European Union	6,4%	1997-1998
USA, United Kingdom, Finland	8 to 9%	1997-1998
Canada	16,5%	2006

Various sources : www.bladi.net ; www.actualites.marweb.com ; www.statcan.gc.ca ...

The share of ICT in 2007 in the GDP of above-mentioned African countries doubled in the same period in Canada and was close to that of other countries 10 years earlier. The significant share of ICT to GDP in industrialised countries probably depends, inter alia, on the fact that the ICT sector includes manufacturing activities (manufacturing of parts, IT equipment, electronics, etc.) as well as service activities arising for the most part from the maze of the informal sector. In developing countries, including Côte d'Ivoire, ICT essentially concerns service activities dominated

by the telephone industry, and there has not yet been an increase in manufacturing industries. Created in 2006, the VITIB, an ambitious project aiming to make Côte d'Ivoire a centre of excellence and reference in ICT and biotechnology through its free zone, is taking a long time to take off. The contribution of ICT to economic growth and to job creation in industrialised countries speaks for itself. In its annual report on initiatives i2010 (the EU strategy aiming to promote the digital economy by combining research, regulation and public-private partners), the European Commission indicates that between 2000 and 2004, ICT have contributed close to 50%⁹ of growth in EU productivity.

According to the CEPICI (Centre de Promotion de l'Investissement en Côte d'Ivoire), telecommunications, considered in their totality, currently represent the most attractive sector in terms of investments in Côte d'Ivoire. Certainly, the investments in themselves do not constitute direct indicators of development or of a reduction in poverty. Nevertheless, through creation of economic activities and employment, which it brings to the sector, they indirectly prefigure this development. It is rightly so that for economists, investments, along with private consumption and exportation of products, constitute the three classic motors of economic growth, which are likely to generate development.

According to the CEPICI (Centre de Promotion de l'Investissement en Côte d'Ivoire), telecommunications, considered in their totality, currently represent the most attractive sector in terms of investments in Côte d'Ivoire.

Table 24. Distribution of investments (in F CFA) in the telephone network from 2005 to 2008

	2005	2006	2007	2008
Mobile telephones	46 477 010 000	139 186 051 000	170 051 765 000	122 837 149 000
Fixed line telephones	7 000 000 000	10 426 000 000	11 448 000 000	-
Total	53 477 010 000	149 612 051 000	181 499 765 000	122 837 149 000

Source: www.atci.ci

ICT have experienced a remarkable expansion over the course of the past decade. In 2006, investments were situated at 139.2 billion F CFA for mobile telephones and 10.4 billion F CFA for fixed-line telephones. In 2007, 170 billion F CFA was invested in the mobile sector versus 11.4 billion fixed. From 1997 to 2008, mobile telephone operators invested 820 billion F CFA. The ICT sector annually generates about 70 billion F CFA in VAT and supports the existence of quality modern infrastructures and a favourable market.

This dynamism of telecommunication in the economy can be seen in the formal as well as in the informal sectors. Thus, we present certain cases that tend to show their contribution in the socio-economic and human development of Côte d'Ivoire.

ICT and the Reduction of Disparities Issuing from the Digital Divide: The Zanzan Case

The observation of allocation policies of development equipment in Côte d'Ivoire reveals a very strong discrepancy between the city of Abidjan and the rest of the country. It was the political and economic capital from 1934 to 1983 and the economic capital since 1983. Abidjan (with 5,878,609 inhabitants in 2009¹⁰ in the agglomeration and 3,796,677 inhabitants in the city, or 20% of the country's total population) has always centralised the main infrastructures, economic and administrative activities (industry, services) of the country. It is to remedy this state of affairs that the transfer period from the economic capital to Yamoussoukro is under way.

Independent of the traditional imbalance in equipment that Abidjan already benefitted from, a new imbalance has now been added. It is the digital divide or gulf, which translated the inequality for the given population or regions to ICT access and to diverse development opportunities that these tools offer. Abidjan centralised on average 70% to 80% of the total of national potential of ICT at the time when certain remote territories of the country and their inhabitants struggle to receive national television broadcasts, mobile telephone coverage from all the operators, and internet access. The northeast region (Zanzan) was, until recently, part of this inequality.

⁹ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/643&format=HTML&aged=0&language=EN&guiLanguage=en>. Below is the link for access to the full report: http://ec.europa.eu/information_society/eeurope/i2010/docs/annual_report/2009/digital_competitiveness.pdf

¹⁰ http://www.populationdata.net/index2.php?option=pays&pid=51&nom=cote_d_ivoire

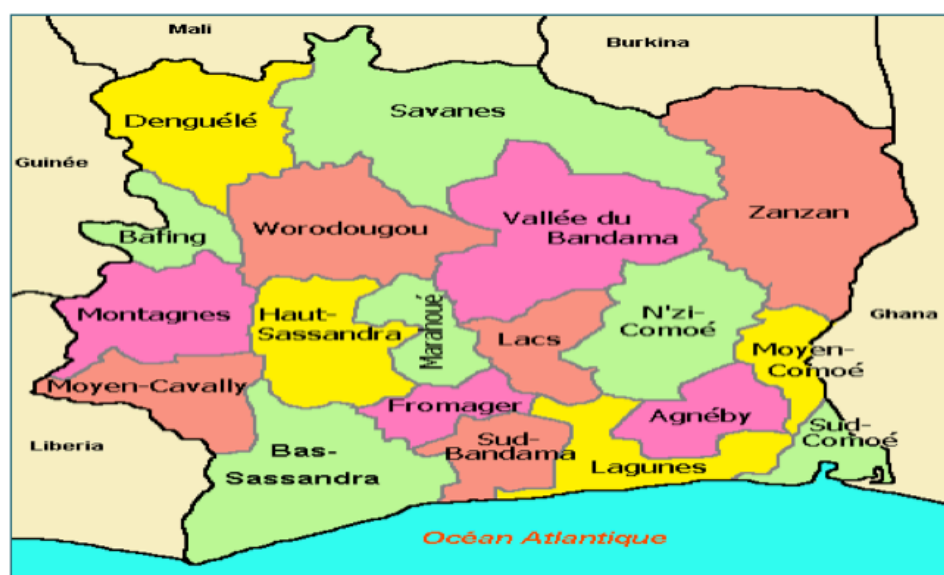


Figure 3. Administrative Regions of Côte d'Ivoire

Source : www.tlfa.ulaval.ca/axl/afrique/cotiv-carte-admin.htm

With a surface area of 38,000 km², the Zanzan region is the second biggest administrative region after Savanes (40,323 km²) and the seventh most populated in 2002 out of the 19 administrative regions of the country. It is the region that benefitted the least from the relatively general dynamic of development that the country experienced between 1960 and 1985. Considering allocations and the socio-economic structure of economic spaces led by the State before the middle of the 1990s, we were very struck by the lag in this region in relation to other regions of the country. The table below gives detailed figures:

Table 25. Regional allocation of State investments from 1971 to 1980¹¹

Regions	Amount (in thousand millions of F CFA)	Amount per inhabitant (in F CFA)	Allocation Index	Deviation from the Average (%)
Total Côte d'Ivoire	2 489,2	371 085	100	-
North	214	342 770	92	- 8
West	122,4	169 975	45	- 55
Western Central	143,3	183 130	49	- 51
Central (excluding Yamoussoukro)	593,8	375 995	101	+ 1
Yamoussoukro	211,5	2 106 725	568	+ 468
East (Zanzan region)	13,1	35 145	9,5	- 90,5
South-West	266	1 364 355	368	+ 268
South (excluding Abidjan)	251,9	207 045	56	- 44
Abidjan	673,2	609 625	164	+ 64

Source: ENSEA & IRD, 2002; Combined calculations with those of PNUD (1997).

The same results come from a study commissioned by the Ministry of the Interior in 2002 specifying that for a long time the Zanzan region has accumulated the lowest regional rates concerning allocations and infrastructure indicators such as electricity, water conveyance, schools,

¹¹ LOUKOU Alain François (2005), « Télécommunications et développement en Côte d'Ivoire à l'ère de la société de l'information et de la mondialisation », Université Montpellier III-Paul Valéry, UFR Arts et Lettres, Langues et Sciences Humaines et Sociales, p. 193.

and health centres. National radio and television broadcasts were not at all received in this region before 1996. To gather information, government officials had recourse to international radio stations on short waves and the native population had to make do with certain national radio programmes from neighbouring countries (Ghana, Burkina Faso).

The Government, in order to provide total coverage of the national territory in radio and television reception, signed a contract with the American company COMSAT in 1993 to transport national programme signals via satellite. In 1996 the project entered the operational phase.

Before the COMSAT operations, the RTI suffered a lot of difficulties in transporting its different signals to the most remote regions of the country, mainly in the northeast. The advantage of satellite is that it allows the transmission of signals without any interdependence between the transmitting centres. From a technical point of view, the COMSAT operation allowed important equipment acquisitions: 14 new transmitter centres, the rehabilitation of 13 old centres, the renovation of national television studios and the construction of relay antenna towers. The transmission system operates via the Intelsat 603 satellite. All signal transmissions are digital in order to protect the broadcasts.

The impact of the COMSAT operation was general and immediate. First of all, it allowed the RTI to broadcast its television and radio programmes throughout the territory (in FM). Then it opened the presence of Côte d'Ivoire to the world, seeing as the programmes of RTI, relayed by geostationary satellites, are henceforth received directly via a parabolic antenna. The repeat of programmes in a digital bouquet is a derivative option.

ICT and Modernisation of Agriculture, the Mainstay of the Economy

For a long time, the Ivorian agricultural sector, the main pedestal of the national economy, was deprived of the beneficial effect of telecommunications. This was due more to a lack of information on role players concerned than through a lack of interest on their part regarding ICT. It is notably the case of numerous Groupements à Vocation Coopérative (GVC) who resort intensely to telecommunication means (telephone, Internet connection etc.) in their daily management. This is a concrete manifestation of the usefulness of these tools in the farming world.

ICT and the West African Stock Exchange: A Real Time Quotation¹²

A stock exchange (of transferable securities) is a marketplace where products such as shares and bonds called real assets are negotiated. This financial function of the Stock Exchange (as financial market) is, following the example of banks, to contribute to the financing of private and public companies as well as communities by means of the savings of citizens who in return hope to draw benefits from their investments. A national stock exchange of modest size of countries with weak economies does not manage to play a major role in development. Hence, in the case of certain West African countries, the initiative was taken in 1973 to establish a common stock exchange space. The advent of NTIC has finally allowed the implementation of this project, which saw the birth of the Bourse Régionale des Valeurs Mobilières (BRVM) on 16 September 1998.

A financial institution of the UEMOA, the BRVM, with its head office in Abidjan and grouping the eight countries of this economic space, is an entirely electronic stock exchange, in other words, one in which the operators are subject to telematics, thus promoting delocalisation, internationalisation and interdependence of markets.

First of all, the use of VSAT presented itself from 1998 to 2002 as the most advantageous solution, likely to guarantee real time access of all the stakeholders to the central site, under identical cost conditions to guarantee equality. Even though the satellite solution was rather practical, it was supplanted (but not abandoned) by other less expensive and even more flexible solutions brought about by ICT. Thus, since 2002, the most generalised solution currently to all stakeholders is Internet access via VPN. Independently from VPN, BRVM uses other solutions such as RTC and RNIS. Two solutions only favourable to the shareholder can be found in Abidjan; the high cost of international communication linked to these applications has a dissuasive role. Since then the wireless solution was also considered by the BRVM.

Whether it is the quotation system called Centralised Electronic Quotation (CEQ) or Decentralised Electronic Quotation (DEQ), ICT plays a more than vital role in the functioning of the BRVM, notably

¹² LOUKOU Alain François (2005), op. cit, pp. 252-272.

for Côte d'Ivoire, the country in which its headquarters are located. The BRVM has not experienced traditional quotation methods such as open outcry, pigeonhole quotations, stock price making, etc. It directly entered the quotation ages or electronic age with IT networks and modern telecommunications.

This recourse to ICT is also supported by the competition to attract broadcasters and negotiators that is currently taking place in the main stock exchange markets of the continent. Better, ICT presently offers the whole African continent the possibility to construct itself a single stock exchange functioning on the technical model of regional stock exchange, which, including BRVM, has already proven itself.

ICT and Emergency of Informal Activities

It is essentially in the telephone (especially mobile) and Internet and connected services (fax, internet café, VoIP) sectors that the informal economy emerged in the telecommunications sector in Côte d'Ivoire.

Firstly, the emergence and then the dynamism of private telephone booths is not only a response to the shortcomings of the formal sector of this branch of activities, but it is also one of the consequences of the information society.

Then, the proliferation of sustainability of informal activities in the sector, also extended to Internet services, is an alternative to the employment crisis after the military-political crisis in 2002, which led to the disappearance of more than 50,000 jobs. The informal sector thus holds the position here of a missing link in the formal system.

Sometimes serving as expedients against misery and social revolts, its informal activities in addition play a role of opening up and integrating urban and rural areas.

It is probably for all these reasons that they benefit from an indulgent understanding from the State. It is an indulgence that is evidenced by an exemption in terms of tax impositions, which does indeed explain, partially, the unavailability of national statistics relating to it.

Perception of the Regulatory Environment of Telecommunications in Côte d'Ivoire

Study Methodology

Surveys, Questionnaire and Interview Guide

For the survey on the perception of the regulatory environments of telecommunications, we couple the quantitative methods of the survey (filling out the questionnaire) with the qualitative method, namely the semi-directive interview. In the interview guide seven (07) reference variables of the questionnaires with the fundamental aspects issuing from each variable as sub-themes were presented in order to have more informed commentary complementary to that initially obtained in the aggregated questionnaires around the mobile telephone, fixed line telephone and Internet access provision sectors. The seven variables in question are :

- market entry ;
- access to rare resources ;
- interconnection ;
- price regulation ;
- regulation of anti-competitive practice ;
- universal service obligation ; and
- service quality.

The variables were defined on the attitude scale of Rensis LIKERT, which describes dimensions from 1 to 5 where **1 = very inefficient**, **2 = inefficient**, **3 = efficient**, **4 = rather efficient**, **5 = very efficient**.

Quantitative Data Collection Method

Data collection was initially meant to be administered in a face-to-face questionnaire, but we were hindered both by the unavailability of respondents or by the huge technical diligence that the questionnaire imposes. This state of affairs led us to administer the questionnaire later on by our statistical units themselves either by mail or physically.

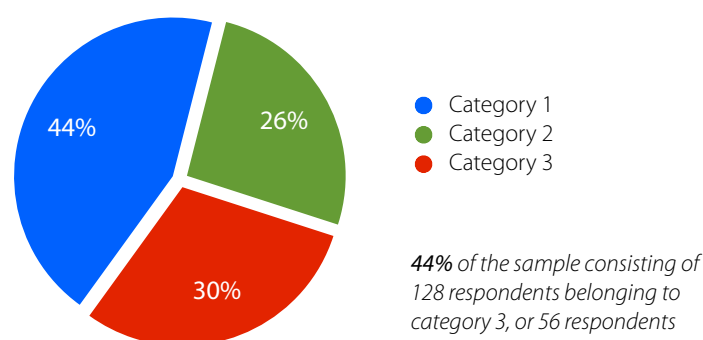
Sample and Survey Plan

No statistical formula was used to determine the size of our sample. The basic principles prescribed were to provide each category or sector with the maximum number of respondents. Below are the details of the categories :

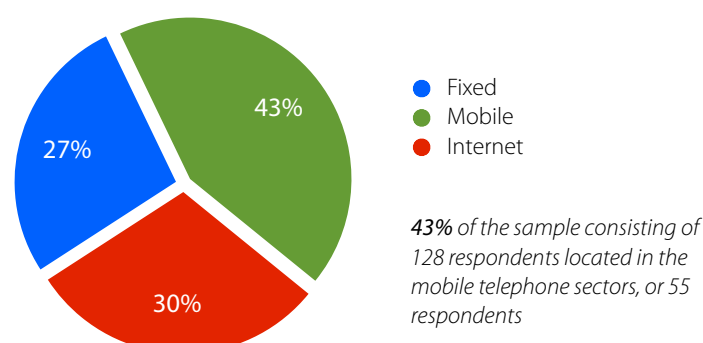
- category 1 : operators, industrial associations, equipment manufacturer, investors ;
- category 2 : financial and stock exchange institutions, telecommunication consultants, law firms ;
- category 3 : universities, research centres, journalists, members of civil society, ICT consumers.

The following graphs indicate the structure of the sample.

Graph 1. Survey categories



Graph 2. Telecommunications sectors



Presentation of Results

The data gathered was analysed exclusively with descriptive statistical tools (frequency, percentage, average). The LIKERT attitude scale use for the purpose of this evaluation was not transformed to digital differentials (- 2, - 1, 0, 1, 2), simply to allow the readability of the data as is.

Table 26.
Distribution of indicators (aggregate date) according to the average score per variable and per sector

		Sector			General Average	
		Mobile	Fixed	Internet		
Variables	1	Market entry	3,04	1,82	2,77	2,54
	2	Access to rare resources	2,87	2,35	2,92	2,71
	3	Interconnection	3,05	3,32	3,11	3,16
	4	Price regulation	2,87	2,79	2,87	2,84
	5	Regulation of anti-competitive practices	2,92	2,41	2,94	2,76
	6	Universal service obligation	2,71	3,53	2,59	2,94
	7	Service quality	3,16	3,59	3,03	3,26
		General Average	2,95	2,83	2,89	

According to all the role players surveyed, out of the three reference sectors, the mobiles hold the highest average scores (2.95) due to the increase in the number of GSM operators since 2006. The dynamism that the telecommunications sector is experiencing has allowed each operator to improve the service quality provided to the user, hence the predominance of the average score for service quality (3,26) over all the other aspects of the study.

Interpretation of Results

Market Entry

For mobile telephones, ease of access to the market can be noticed because of the transparency, the reasonable time for licence allocation, the knowledge and comprehension of conditions for the acquisitions and the use of the licence. However, the licence acquisition cost from the ATCI for the use of the two 900 MHz and 1800 MHz frequencies in operations in the field still remains high.

The penetration rate for fixed-line telephones, according to the respondents, is weak, due to the situation of the monopoly of the incumbent operators, but also due to the success of GSM.

For Internet access provision, the general penetration rates (estimated between 14 and 15%) still remain weak. This state of affairs is due in large part to the high cost of terminal equipment and the poverty of the population.

Access to Rare Resources

As for mobile telephones, it seems that the respondents observe certain fluidity in access to 900 MHz and 1800 MHz frequencies (spectrums). They are granted as soon as the requirement specifications are signed. This notes the technical efforts and considerable transparency from the ATCI. The transmission supports used are radio-relay links, fibre optics and VSAT with preference for the use of radio links due to the fact that Côte d'Ivoire still has a long and good router network.

For fixed telephone lines, the two technologies used are cables (for fixed lines), over which the incumbent operator holds a monopoly right, and the CDMA (for wireless fixed lines) which recently came into use by the two operators in the sector. The other operator (Arobase Telecom) transmits its calls via CDMA exclusively and for the moment only in the city of Abidjan.

Apart from ADSL access on the incumbent operators' cable network (rented from this same operator), each Internet access provider acquires and uses the customary technologies in the sector through their own resources. Alongside the frequencies granted by the ATCI, there are free frequencies for use by all IAPs, though there are often network interferences.

As for mobile telephones, it seems that the respondents observe a certain fluidity in access to frequencies.

Table 27. IAP and main technology used

Technologies	IAP
ADSL	Aviso
Radio links	Other IAPs
Wi Max and Pre Wi Max	Afnet
CDMA	Afnet
VSAT	All IAPs (Back-up solution)

Source: Survey.

VSAT is used by all the IAPs in case of problems with other technological supports. The Internet output of Côte d'Ivoire and thus of Côte d'Ivoire Télécom, subsidiary of France Télécom, is provided by SAT-3 (33 Mb/s), and its saturation is expected in 2011. Three cable projects are in progress. They are :

- WACS (West Africa Cable Systems) an Afnet from MTN CI initiative ;
- Main One, a foreign operator initiative ; and
- Glo Cable, a foreign operator initiative.

Interconnection

Interconnection for mobile telephones is freely negotiated between licensed operators in business. It is imposed by the regulation authority (ATCI), though the supervision (interference) is not direct. This situation is the origin of the malfunctioning experience in the sector, born from the asymmetry of the interconnection rate between certain operators and abuse of the dominant position linked to the historic status of certain operators. This state of affairs requires the revision of procedures and interconnection costs, which has led to the increase implication required by the regulation

authority (having, however, allowed the drop in the interconnection cost of 12 F CFA) and the implementation of a new telecommunications Code, which has already been announced.

Interconnection of fixed-line telephones is provided by fibre optics and radio-relay links from the fixed telephone operators to the national operators (mobile and fixed). Internationally, interconnection is effected via SAT-3 cable. For national as well as international interconnection for fixed-line telephones, the rates are set by the ATCI.

Price Regulation

GSM operators use rate plans that are rather varied, always changing and even complicated from the user's point of view.

GSM operators use rate plans that are rather varied, always changing and even complex from the user's point of view. Rates vary, indeed, according to the payment method (prepaid, post-paid), the time of day (peak or off-peak hours), the frequency of the call ("friend" numbers or not) and according to the termination operators (internal or external). Concerning post-paid offers, the monthly charge was removed in 2006 in favour of a flat rate per subscription. Prepaid offers have strongly contributed to the spread of mobiles. Introduced in 1998, they now represent more than 98% of the total number of subscribers and 70% of the operators' turnover. The uniqueness of the proposed communication rate benefits, upon entering the market, for Moov, KoZ and Green Network, have had the effect of inciting the leading operators to reduce their rates. Rates establish themselves and adjust themselves in accordance with the realities of the competition market.

The increase in the number of GSM operators, with the backdrop of making a diversity of technological services with high added value available to consumers, has led to a declining tendency in prices issuing from the reversal of the monopoly of the incumbent operator over the fixed-line telephone sector. The advent in 2002 of Arobase Telecom with its CDMA technology has also contributed strongly.

As for Internet access provision, practical prices are in accordance with the different IAP service offerings, which consist of :

- individual solutions ;
- company solutions ;
- dedicated solutions ;
- Internet telephony (VoIP).

The rates, having experienced a general decline because of the endlessly growing number of operational IAPs, remain high, especially compared to certain countries in the sub-region (Senegal, Ghana, etc.).

Regulation of Anti-Competition Practices

Generally, Ivorian jurisdiction includes the telecommunications Code, laws, decrees and regulatory texts, which seem unsuitable to the technological development of the sector.

Ivorian jurisdiction includes the telecommunications Code, laws, decrees and regulatory texts which seem suitable to the technological development of the sector. We note the presence of two organs in charge of regulations; the ATCI, which plays a major role (with extended competencies allowing it to be first on all the questions relative to the sector) and on the other hand, the CTCI having the role of arbitrator (though whose decisions suffer from a lack of execution). To these organs, a Competition Commission is added, the current non-functioning of which constitutes a real delay in the control of anti-competitions practices experience in the sector (abuse of dominant positions, auctioning of ADSL).

Universal Service Obligation

Out of all three sectors, universal service obligation is situated in the framework of a process, a strategic plan in which the state is the linchpin. Carrying out this process will, in the near future, lead to telecommunication services and products being accessible to the entire population living in the national territory. The FNT was instituted with this in mind. Currently, each telecommunications company sets itself up in accordance with its target market in view of the profitability of its investments. There is no constraint of territorial coverage or adjustment in the licence contract given to operators. The only constraint in the sector remains that of quality, which as it happens, is contractually negotiated between clients and operators according to certain available services. It is, for example, the case of dedicated speeds at the level of Internet access provision. As far as the implantation of fixed telephone lines is concerned, in all the towns served by the administration, it obeys the rural technology imposed on Côte d'Ivoire Telecom by the state.

Service Quality

Service quality is perceived by the respondents as good in the three sectors with an average score corroborating their opinion (3.16 for mobile telephones, 3.59 for fixed telephones and 3.03 for internet access provision). This opinion is mainly justified by :

- the conformity of equipment/terminals to GSM/UIT standard for mobile telephones ;
- the conformity of technical equipment to GSM standards, call quality, and connection speed for fixed-line telephones ;
- connection speed depending on the speed of the connection subscribed to for Internet access provision.

As for Internet access provision, service quality (connection speed) for shared offers, in other words individual solutions, is generally not that suitable for certain solutions subscribed to. The observation of the constraint of service quality is rather for dedicated speeds of Company Solutions.

The advent of the CDMA technology by Arobase Telecom in the fixed telephone sector has heavily boosted and stimulated the services offered to clients and in reaction to the quality, even leading the incumbent operator to procure it.

In order to assess the global service quality of the five mobile networks in operation, the ATCI commissions an annual audit. The 2009 classification details of the operators are presented in the table below.

Table 28. 2009 service quality classification of GSM networks in Côte d'Ivoire

Elements of Evaluation	Mobile Networks				
	Orange CI	Moov CI	MTN CI	Comium CI	GreenN
Best network – general classification	1 st	2 nd	3 rd	4 th	5 th
Best network – classification over Abidjan	4 th	1 st	2 nd	5 th	3 rd
Best Radio Coverage	2 nd	5 th	1 st	3 rd	4 th
Best Network Availability	2 nd	1 st	5 th	3 rd	4 th
Best VOICE Service	2 nd	1 st	3 rd	4 th	5 th
Best SMS Service	1 st	3 rd	4 th	2 nd	5 th
Best DATA Service	1 st	2 nd	4 th	5 th	3 rd

Source: ATCI (2009), audit report on quality of mobile networks in Côte d'Ivoire, reorganised data.

Orange CI is classified as the best mobile network in Côte d'Ivoire in 2009.

Service quality is perceived by the respondents as good in the three sectors, with an average score corroborating their opinion (3,16 for mobile telephones, 3,59 for fixed telephones and 3,03 for internet access provision).

Conclusion

2006 marks the end of the duopoly in the mobile telephones market in Côte d'Ivoire with the advent of five new GSM operators, of which three are already in operations and have enormously boosted and encouraged the reduction of fixed prices to the end user. This situation makes Côte d'Ivoire the leading country in sub-Saharan Africa with a high density of GSM operators.

The fixed telephone market, which was negatively influenced by this state of affairs and which was practically dominated by the incumbent operator, still remains dependent on the local loop grouping, since the link in infrastructure inherited from the State management of the telecommunication sector was only partial. Certain GSM operators henceforth invest in their own backbone, and the question of universal service is addressed in the framework of a Fund created in 1998, then dynamised in 2006.

The number of Internet access providers experienced a continuous dazzling rise but the problem of the management of exhaustive and accurate statistics pertaining to it escapes the regulator. This led to the adoption of a platform in 2010 to address this problem.

The regulation of telecommunications is crystallised in the Telecommunications Code of 1995 and lacks adequacy in the contemporary problems inherent in the sector. The current socio-political situation hinders the implementation of reforms and bills that are already initiated and integrate the innovative aspects, pertinent to telecommunication with a tendency to offer role players a highly competitive environment.

In the opinion of all the role players surveyed, out of the three reference sectors, mobiles hold the highest average score (2.95) due to the fact that the number of GSM operators has increased since 2006. This situation caused the fixed telephone sector to lose a share of its market share, even relegating it to the rank of least performing sector after the internet access provision sector.

This change in dynamic which has been taking place in the telecommunication sectors has allowed each operator to improve the quality of service provided to the end user. This is the reason for the high average score of service quality (3.26), which exceeds scores in all other aspects of the study.

As for the perception of the regulatory environment as regards telecommunications, the results are certainly encouraging overall, though efforts have to be made for all the reference sectors of the study as well as for each aspect that it integrates.

Bibliographic References

- AKEPO Jean-Marie (2010), « *Internet Mobile et applications locales* », Initiatives pour la Gouvernance d'Internet en Côte d'Ivoire, juillet 2010.
- ATCI (2009), « *Audit de la qualité de service des réseaux mobiles en Côte d'Ivoire* », Abidjan.
- ATCI (2008), « *Rapport annuel* », Abidjan.
- BAKAYOKO Hamed, (2008) « *Discours à la cérémonie d'ouverture des JNTIC 2008* », 21 mai.
- BAKAYOKO Hamed, (2009) « *Discours lors des JNTIC 2009 : "La protection des enfants dans le cyberspace"* », 17 mai.
- Banque Mondiale (2009), « *Rapport annuel (bilan de l'exercice)* », Washington.
- BLANCHARD Dominique (2004), « *Panorama des télécommunications en Côte d'Ivoire* », CSDPTT, Île de France.
- CI-CERT (2009), « *Rapport d'activités* », Abidjan.
- C.K., (2010) « *Rien ne semble plus aller entre Koz, Comium (produits de Comium Sa) et GreenN, d'une part et MTN, Orange, Moov et Côte d'Ivoire Telecom, d'autre part* », Le Nouveau Réveil, 13 avril.
- DEMBÉLÉ Ismaël, (2010) « *Téléphonie / Interconnexion entre les opérateurs cellulaires - Koz-Comium et Green dans le collimateur d'Orange Côte d'Ivoire* », L'intelligent d'Abidjan, 13 avril.
- Gouvernement (2009), « *Document de Stratégie de Réduction de la Pauvreté* », Abidjan.
- KÉI Didier (2010) « *Gouvernance de l'internet / HOUGA BI Gohorey réaffirme la détermination du gouvernement* », Notre Voie, 9 juillet.
- KODIA B. Jean-Marc (2010), « *Accessibilité et diversité : Quelle politique d'incitation à la vulgarisation de l'accès ?* », Initiatives pour la Gouvernance d'Internet en Côte d'Ivoire, juillet.
- LOUKOU Alain François (2005) « *Télécommunications et développement en Côte d'Ivoire à l'ère de la société de l'information et de la mondialisation* », Université Montpellier III-Paul Valéry, UFR Arts et Lettres, Langues et Sciences Humaines et Sociales, 410 p.
- MELEU Mathieu (1999), « *Participation du secteur privé à la fourniture des infrastructures en Côte d'Ivoire : Revue et recommandation* » African Development Bank Economic Research Papers, n°47.
- Ministère des NTIC (2009), « *Panorama des TIC en Côte d'Ivoire* », Abidjan.
- Recueil des textes sur les Télécommunications en Côte d'Ivoire.
- TADJAU P., (2009) « *Création d'emplois par le secteur privé / Le ministre Hubert Oulaye : "Le chômage est une réalité en Côte d'Ivoire"* », Le Nouveau Réveil, 3 juin.
- UIT (2006), « *Rapport sur le développement des télécommunications/TIC dans le monde 2006 : Mesurer l'incidence des TIC sur le développement économique et social* », Genève

Acronyms and Abbreviations

ACOTEL-CI	Association des Consommateurs de Télécommunications de Côte d'Ivoire
ADSL	Asymmetric Digital Subscriber Line
AGEPE	Agence d'Etude et de Promotion de l'Emploi
ATCI	Agence des Télécommunications de Côte d'Ivoire
BICICI	Banque Internationale pour le Commerce et l'Industrie de Côte d'Ivoire
BLR	Boucle Locale Radio
BRVM	Bourse Régionale des Valeurs Mobilières
CDMA	Code Division Multiple Access
CEDEAO	Communauté Economique Des Etats de l'Afrique de l'Ouest
CEQ	Centralised Electronic Quotation
CEPICI	Centre de Promotion de l'Investissement en Côte d'Ivoire
CFI	Canal France International
CI	Côte d'Ivoire
CIRES	Centre Ivoirien de Recherches Economiques et Sociales
CI-CERT	Côte d'Ivoire Computer Emergency Response Team
CNCA	Conseil National de la Communication Audiovisuelle
CTCI	Conseil des Télécommunications de Côte d'Ivoire
DEQ	Decentralised Electronic Quotation
DSRP	Document de Stratégie de Réduction de la Pauvreté
EDGE	Enhanced Data rate for GSM Evolution
EU	European Union
FACCI	Fédération des Associations de Consommateurs de Côte d'Ivoire
F CFA	Franc de la Communauté Française d'Afrique
FM	Fréquence Modulation
FNT	Fonds National de Télécommunications
FO	Fibre Optique
GDP	Gross Domestic Product
GNI	Gross National Income
GPRS	General Radio Packet Services
GPS	Global Positioning System
GSM	Global System for Mobile
GVC	Groupement à Vocation Coopérative
IAP	Internet access provider
ICT	Information and Communication Technologies
INS	Institut National de la Statistique
IP	Internet Protocol
JNTIC	Journées Nationales des Technologies de l'Information et de la Communication
MMS	Multimedia Messaging Service
MTN	Mobile Telecommunication Network (Telephone operator)
NDC	National Destination Code (Indicatif d'opérateur)
NICT	New Information and Communication Technologies
PTT	Push To Talk

RIA	ResearchICTAfrica
RNIS	Réseau Numérique à Intégration de Services
RTC	Réseau Téléphonique Commuté
RTI	Radiodiffusion et Télévision Ivoirienne
R&D	Research and Development
SGBCI	Société Générale de Banques en Côte d'Ivoire
SIG	Système d'Information Géographique
SIM	Subscriber Identifier Module (GSM)
SME/SMI	Small and Medium Enterprises/Small and Medium Industries
SMS	Short Message Service (GSM)
VAT	Value Added Tax
UEMOA	Union Economique et Monétaire Ouest Africaine
UIT	Union Internationale des Télécommunications
UNETEL	Union Nationale des Entreprises de Télécommunications
URECOS-CI	Union Régionale des Entreprises Coopératives des Savanes de Côte d'Ivoire
USD	United States Dollar
VITIB	Village des Technologies de l'Information et de la Biotechnologie
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal
VoIP	Voice over Internet Protocol (Téléphonie sur Internet)
WACS	West African Cable Systems
WAP	Wireless Application Protocol
WiMax	Wireless Maximized

IDRC  **CRDI**



ISSN: 2073-0845