

**AFRICAN UNION**

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**STUDY ON HARMONISATION OF TELECOMMUNICATION,  
INFORMATION AND COMMUNICATION TECHNOLOGIES  
POLICIES AND REGULATION IN AFRICA**

**DRAFT REPORT**

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# **I. INTRODUCTION**

## **1 Infrastructure Development in Africa**

Countries that have harnessed the potential of Telecommunication/ICT networks and services have attained significant social and economic development. In addition, they are rapidly transforming into information and knowledge-based economies. In realization of the need to be integrated into the globalization process, Africa has sought to strengthen and diversify its productive base by attracting new direct investments for the production of quality manufactured goods and services. Infrastructure development is a primordial prerequisite in achieving this goal. The history of humanity is replete with examples of the far-reaching contribution of infrastructure to development. A noteworthy example is that of the Romans who built their empire through road construction. The United States of America, Europe and Japan also achieved their development through the construction of huge infrastructures of road, railway, airport, energy, Telecommunication/ICT networks, etc.

Thus, aware that infrastructure constitutes not only the foundations of physical integration but should, in addition, serve as the engine of economic development and as a facility to stimulate commercial flows as well as social and cultural interactions, the African Union Commission defined its Vision in this area in the following words: “an Africa endowed with integrated transport, communication and energy infrastructures that are reliable, efficient and affordable as a necessity for the promotion of regional integration and the Continent’s participation in globalization”.

African countries gave expression to this Vision in the New Partnership for Africa’s Development (NEPAD), a program of the African Union Commission whose cardinal objective is to build transport, energy and water resources networks and systems as well as appropriate Telecommunication/ICT infrastructure, interconnecting African States and regions with the aim of meeting economic needs and providing basic public and social services for the entire population.

The African Union’s initiatives in the area of infrastructure development are embodied by two priority program of its Strategic Plan, namely: “Connecting Africa” and “Bridging the Digital Divide.”

## **2 Information and Communication Technologies (ICT): Development Opportunities**

Globalization and the Information and Communication Technologies are two major forces that shape the future of the world through elimination of geographical borders, cross fertilization of cultures and societies and the creation of a new economic and commercial order. The Information Society constitutes the world of tomorrow, which is in the making today with Telecommunication/ICT; and no country and, indeed, no region can run away from them. Telecommunication/ICT are the bedrocks and facilitators of economic, social and cultural development. The creation of effective Telecommunication/ICT systems and services represents, more particularly for Africa, the springboard absolutely necessary to attain the Millennium Development Goals (MDGs). ICT not only bolster the efficacy of all human activities; they also

open up new horizons, thanks to their catalytic role in creativity and knowledge exchange.

In view of the aforesaid, several development stakeholders in the Continent have placed the Telecommunications/ICT sector at the heart of their priority initiatives. Consequently:

- The governments of African States are seeking to put in place appropriate mechanisms for inclusive and expeditious development of Telecommunication/ICT use and their integration into all development plans and activities;
- Regional and international organizations and all Africa's partners, to a large extent, integrate the Telecommunication/ICT component into their initiatives and activities.

### **3 Need to create an attractive policy environment and institute enabling regulatory practices in Africa**

At various forums held on the Telecommunication/ICT sector, it was recognized that infrastructure development in Africa and its rational exploitation call for an enabling and appropriate environment. In fact, regional infrastructure cannot be developed unless there is, at regional level, a policy and regulatory framework that enable stakeholders to build a common understanding on the objectives and a clear definition of the rules of the game that are key factors in attracting consequent investment flow.

The existence of appropriate policy and regulatory framework is a vital factor for attracting private investors. This is a priority in the context of the multi-form and multi-player interventions in the sector. Currently, it is observed that, in the absence of appropriate policy frameworks at national and regional levels, different stakeholders often engage in diverse actions for the same beneficiaries and in pursuance of the same objectives, a situation that does not ensure effectiveness and efficacy of collective effort and sustainability of achievements.

Given the aforesaid situation, the African Union Commission, as part of its ultimate goal of rapid integration and sustainable development of the Continent, has made it a point to work with all stakeholders to establish and strengthen policies and regulatory frameworks conducive to the harmonious and expeditious development of regional and continental Telecommunication/ICT networks and services. This Study formulates a policy and regulatory reference framework for the harmonious development and application of Telecommunication/ICT within the African continent with a view to turning Africa into an information society.

To carry out the study, a High Level Committee (HLC) and set a team of six African consultants was set up to support the African Union Commission in the process. The **Annex 1** shows the methodological approach set up to carry out the study as well as the approval process of the conclusions. The report of the study is structured in two parts A and B.

The part A describes the context in the following three chapters.

- The first chapter entitled “Africa in brief” deal with the geography and economy of Africa;
- The second chapter entitled “Status of Telecommunication/ICT sector in Africa” deal with telecommunication and ICT networks and services, policies and regulation frameworks and major challenges to be addressed;
- The third chapter three is a summary of “ Efforts deployed from all side to address the challenges”;

The part B is composed with three major chapters.

- The need to establish an enabling policy environment is describe in the first chapter;
- The second chapter deal with the Vision, mission and guidelines;
- The third chapter is the main part of the study is composed with the proposed “Reference framework for the harmonization of Telecommunication/ICT policies and regulation in Africa”.

**PART: A**

**CONTEXT**

# I Africa in Brief

## 1.1. Geography and structure

Africa has a terrestrial mass of 30.3 million km<sup>2</sup>. By way of comparison, Africa's territorial area represents the total of the land areas of the following countries and geographical groupings: India, Argentina, United States of America, Mexico, China and 15 Members of the European Union<sup>1</sup>. An equatorial and tropical Continent *par excellence*, the Continent is characterized by hot and dry weather (30% desert and 20% forest). The African population<sup>2</sup> was 906 million in 2005 and is estimated at 933.5 million in 2007. In 2025, this figure will be around 1.355 billion, and 1.994 billion by 2050, i.e. second in the world after Asia.

Africa is structured into five (5) geographical regions, which are: Southern Africa, Central Africa, East Africa, North Africa and West Africa, several *Regional Economic Communities* (RECs) and *Inter-Governmental Organizations* (IGOs)<sup>3</sup>. **Annex 2** features the distribution of Member States by RECs and Geographical Regions. The following eight (8) RECs are recognized by the African Union:

- Arab Maghreb Union (AMU) established in 1989 and made up of five (5) States with the objective to, among other things, achieve full economic union;
- Common Market for Eastern and Southern Africa (COMESA) established in 1994 and made up of (20) States, with the objective, among other things, to achieve full common market;
- Community of Sahel-Saharan States (CENSAD) established in 1998 and is made up of twenty three (23) States (on June 2007) with the objective, among other things to establish a comprehensive economic union;
- East African Co-operation was first created in 1967. East African Community (EAC) was established in 1999 and made up of five (5) States, with the objective to, among other things, achieve full economic union;
- Economic Community of Central African States (ECCAS) created in 1983 and comprising eleven (11) States with the objective to, among other things, achieve full economic union;
- Economic Community of West African States (ECOWAS) established in 1975 and made up of 15 States, with the objective, among other things, to realize total union;
- Inter-Governmental Authority for Development (IGAD) created in 1996 from IGADD created in 198. IGAD is made up of eight (8) States with the objective, among other things, to achieve full economic union;

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<sup>1</sup> Europe with 25 Member States: Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, United Kingdom and Sweden.

<sup>2</sup> Source: the AU: The State Of The African Population 2006

<sup>3</sup> Source: African Union Strategic Plan 204



- Southern Africa Development Community (SADC) created in 1980 and made up of fifteen (15) States with the objective, among other things, to achieve full economic union;

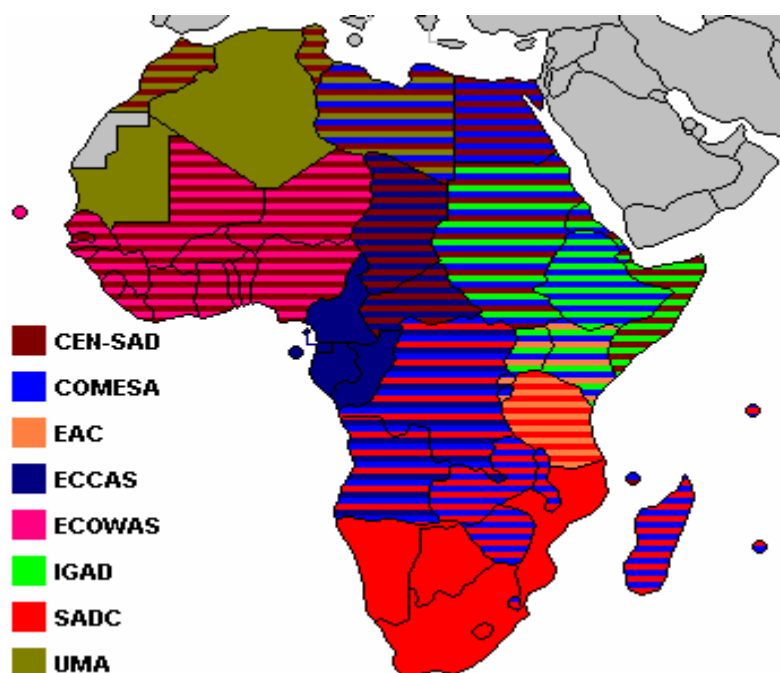


Figure 1.1: REC pillars of the African Economic Community.

REC	Area (km <sup>2</sup> )	Population	GDP (PPP) (\$US)		Member States
			in millions	per capita	
ECOWAS	5,112,903	251,646,263	342,519	1,361	15
ECCAS	6,667,421	121,245,958	175,928	1,451	11
SADC	9,882,959	233,944,179	737,335	3,152	15
EAC	1,817,945	124,858,568	104,239	1,065	5
COMESA	12,873,957	406,102,471	735,599	1,811	20
IGAD	5,233,604	187,969,775	225,049	1,197	7
CEN SAD	13,650,000	421,000,000			23 (At June 2007)
UMA	5,782,140	84,185,073	491,276	5,836	5

Table 1.1. RECs population and economic data. Source: African Economic Communities;

Infrastructure development features in all the Treaties establishing the Regional Economic Communities (RECs); and the said Treaties recognize the need to establish reliable, efficient and environment-friendly infrastructure capable of meeting economic imperatives and providing basic social services.

## 1.2. Economy

Africa is endowed with abundant mineral and energy resources as well as agro-pastoral wealth. Despite its immense resources, Africa is unable to take advantage of economic globalization and is, in fact, on the brink of marginalization. As a matter of fact, whereas it accounts for 14% of the world's population, Africa's share of global GDP and global trade stands at 1% and 2%, respectively. This under-development situation is illustrated by the fact that over 30 of the 48 Least Developed Countries (LDCs) in the World are to be found in Africa. Figures 1.2; 1.3 and tables 1.1 and 1.2, shows main economical indicators of the continent and RECS;

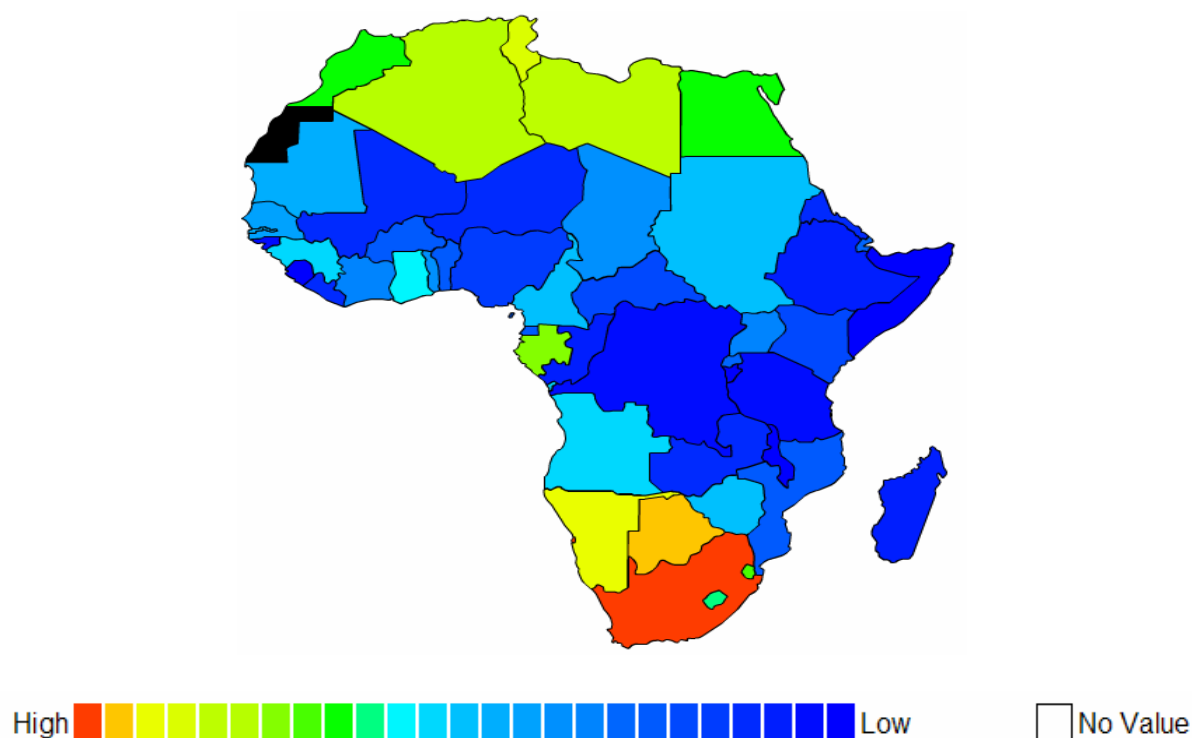


Figure: 1.2. National GDP per capita ranges from wealthier states in the north and south to poorer states in the east. These figures from the 2002 World Bank are converted to US\$.

Indicators	1990	1999	2000	2001	2002	2003	2004	2005	2006
Real GDP growth rate (%)	2.2	2.8	3.2	4.3	3.6	4.7	5.8	5.6	5.6
GDP per inhabitant (US \$)	734.4	627.6	628.4	610.2	632.5	749.7	886.0	1010.8	1113.0
Inflation (% of GDP)	15.4	10.8	12.6	11.4	8.0	7.3	5.5	6.6	6.3
Current Account (% GDP)	-1.3	-3.2	1.8	0.2	-1.4	-0.3	0.1	2	3.1
Total External Debt (% GDP)	59.2	66.3	62.9	61.3	60.6	54.0	46.9	36.1	26.7
Debt Servicing (% Exports)	23.0	20.8	17.5	17.9	14.5	13.0	11.2	11.4	14.5

Table: 2.1 Africa Economic Indicators. Source: IMF and ADB

## II. Status of the Telecommunications/ICT Sector in Africa: the ever-challenging Digital Gap

### 2.1. Networks and Services

#### 2.1.1. General Information

Generally, the structure of Telecommunications/ICT networks has changed in recent years. The changes have been due to the transformation from a status of separate multi networks (each network being optimized for a single service) to a status where a single IP type network offers all services in countries across the world. These structural changes (Figure 2.1) triggered drastic modification of the market structure (Figure 2.2).

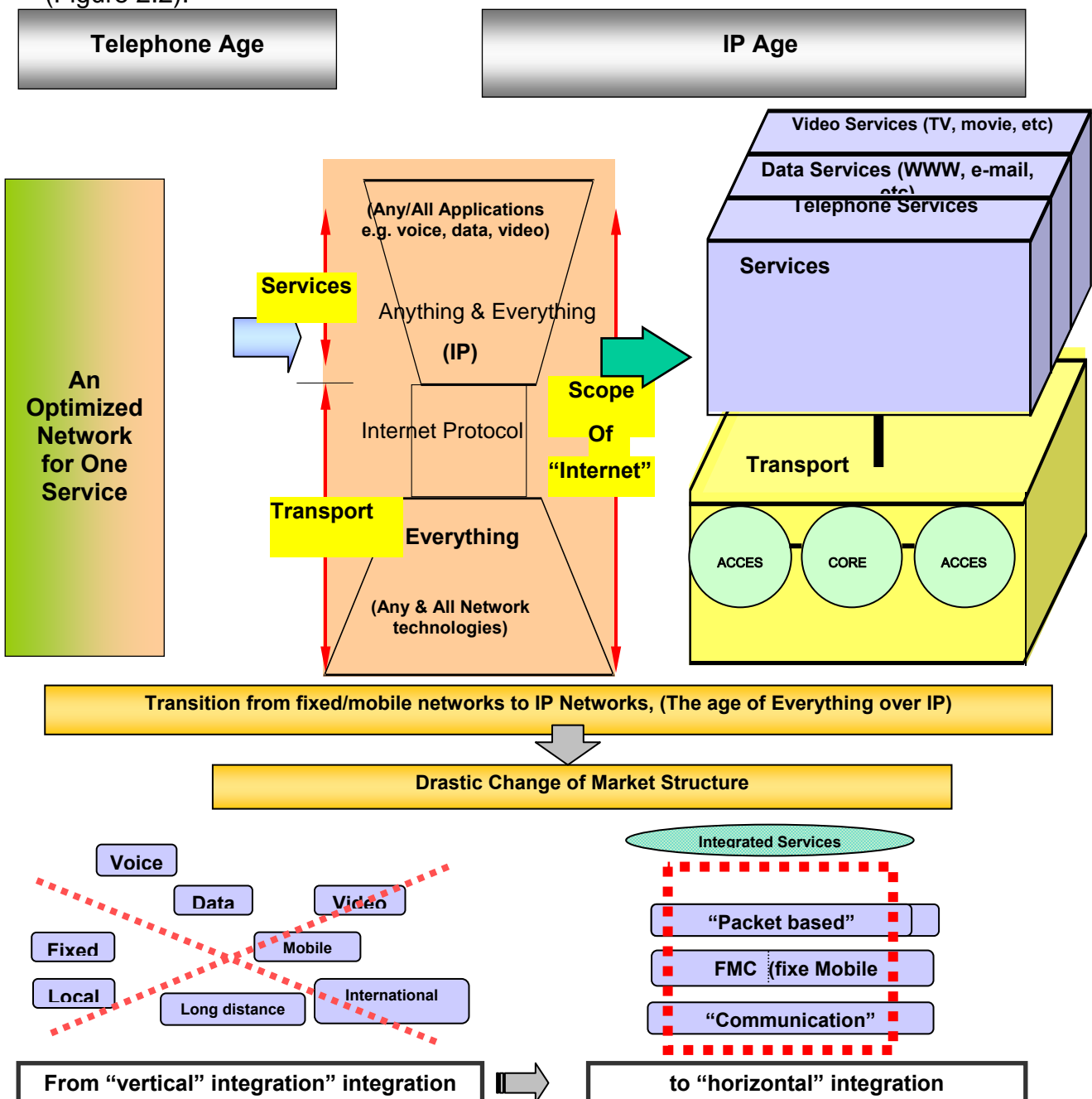


Figure 2.2: Market Structure

## a. Public Switched Telephone Networks (PSTN)

For many years, countries and many organizations and Institutions have, made efforts in various forms (aid, bilateral and/or multi-lateral financing, expertise, etc) to modernize and develop telecommunications networks and services in Africa. Every country has an international segment of network comprising at least one or 2 switches for international transit and terrestrial satellite communication stations. In addition, some countries have landing or connection points for fiber optic sub-marine cables networks.

The continued decline in traditional PSTN, is due in part to the migration of telecommunications from fixed to mobile lines, including what is known as convergent fixed-mobile service. Despite the numerous cooperation frameworks offered to network operators and service providers through the activities of ITU, ATU and RECs/IGOs, network interconnections, characterized inter alia by effective operation of the existing Inter-African links, are essentially hampered by commercial considerations. Consequently, a great proportion of the traffic between African countries has continued to transit from outside the Continent, leading to huge transit charges and foreign currencies losses. Moreover, technical service quality and the bandwidth of the various networks are not always consistent with customer needs and are, with a few rare exceptions, suitable for the transport of an assorted range of services especially multi-media services. In Africa in the past 15 years, three (3) major changes have impacted negatively on the development of PSTN's and fixed telephony networks, namely:

- The introduction and dissemination of mobile telephony and IP telephony services;
- The by-passing of fixed telephony infrastructure network by most of new entrants ; and
- Fixed-mobile convergence.

Many operators have mapped out and implemented strategies for transition to NGN. A detailed analysis of the significant changes that have taken place in the past 25 years is illustrated in Figure 2.3 below:

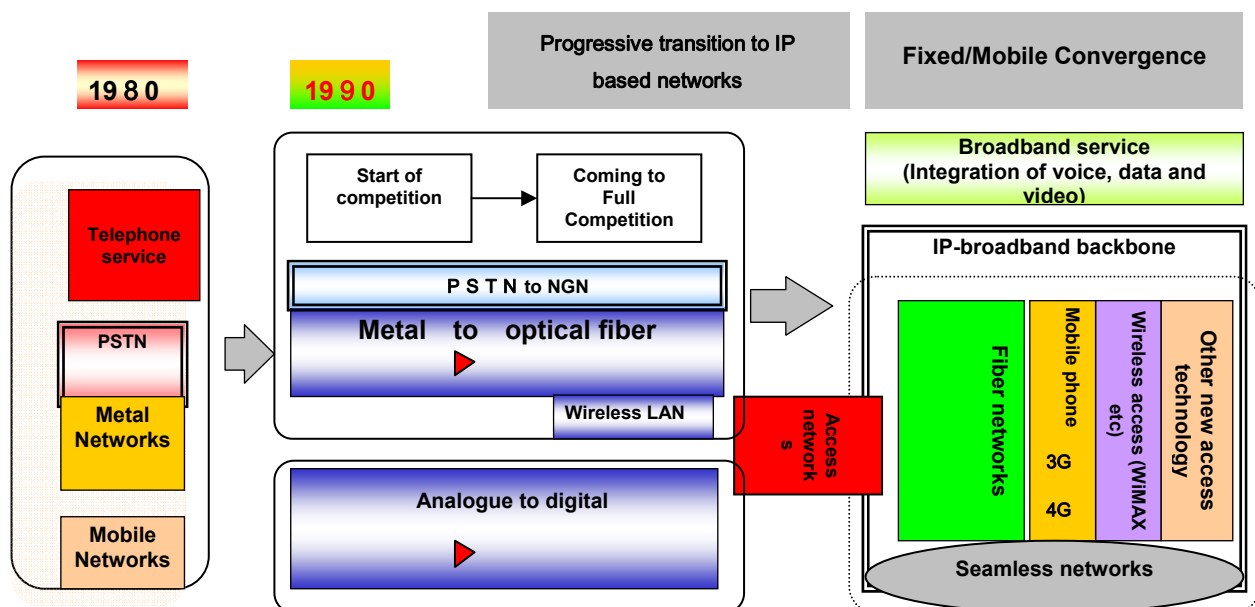


Figure 2.3: Evolution Towards NGN

## b. Cellular Networks and Market

In most African countries, access to basic telecommunication services has, to a large extent, obtained due to mobile network operators; and the growth of mobile networks has continued to exceed fixed networks. This trend is attributed to the establishment of prepaid mobile services, the rapid and more economical networks deployment and a competitive climate.

Most mobile networks are deployed and operated under license by both private and traditional operators. There are at least two networks per country (see Figure 2.4). It is worth mentioning that the number of operators per State does not follow any discernible trend. For instance, some States with small markets in theory, owing to their modest size and/or low population, have three operators. The networks were first deployed in cities and their environs, along major roads and tourist centres. In many countries, the number of mobile lines has surpassed fixed lines.

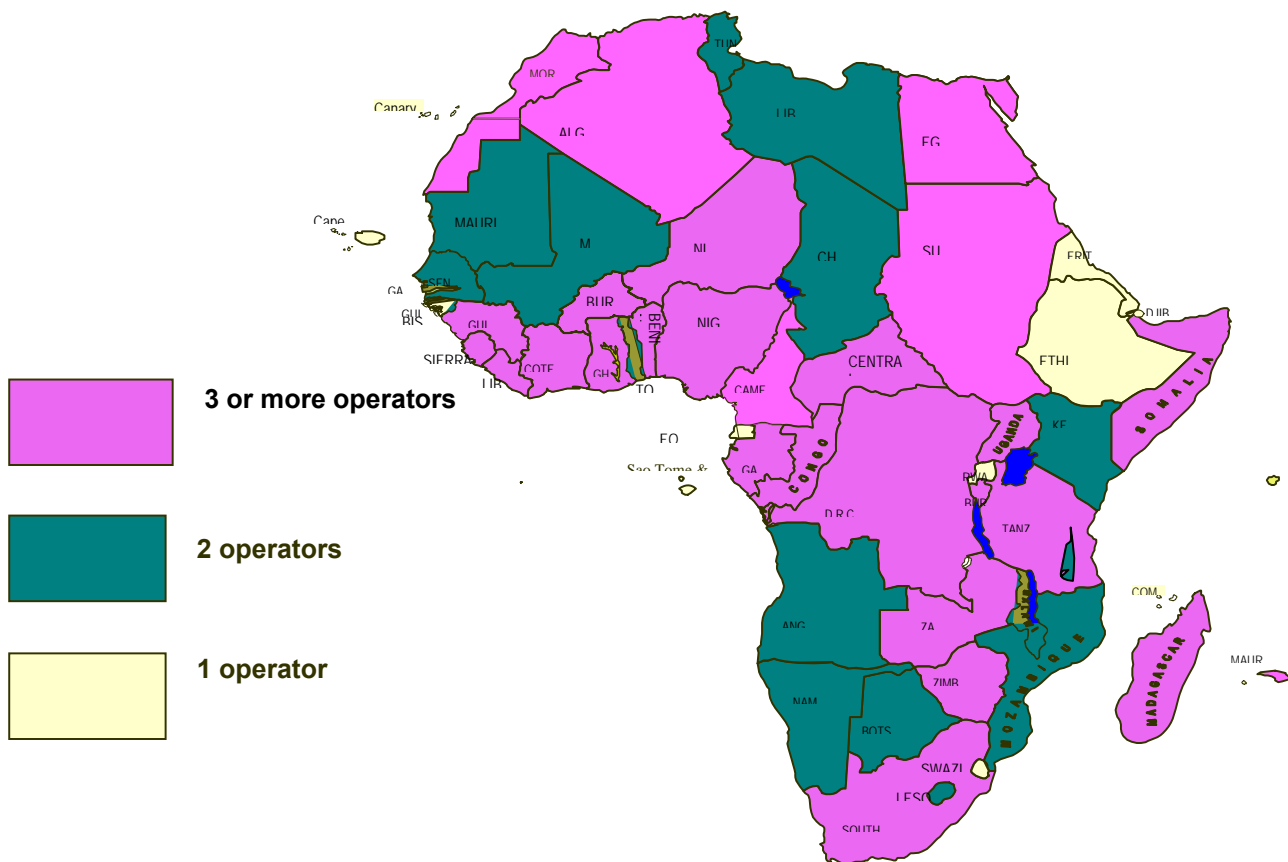


Figure 2.4: Number of Mobile Telephone Operators (September 2007)  
Source: ITU & other sources

## c. Internet

In Africa, the national access nodes to the global Internet network are generally linked to the Internet Exchange Points (IXP) belonging to international operators based mainly in the United States, Europe and Asia. Consequently, with the exception of a few countries (Figure 2.5), which have national IXP, it is nearly impossible, in most cases, to create a national or inter-African Internet communication without going out of Africa. Thus, Africa spends between US \$400 million and US\$600 million a year in transit fees for Inter African traffic.

In term of penetration, Africa still has only 0.3 percent of global activity in the Internet – with a total of one and a half million hosts, as compared to 88 million in Europe, 42 million in Asia and 18 million in Latin America. The other reasons that may explain the low penetration of Internet in many African countries are mainly poor quality of service, insufficient bandwidth, high access cost compared to other regions, etc.



Figure 2.5: Internet Exchange, Points in Africa: 2007, Source: www.NSRC.org

In 2007, a total of 14 African countries have IXPs. Some of these countries were connected to the SAT-3/WASC cable, namely, Ghana, Nigeria and South Africa. Private bilateral peering is relatively easy to be put in place between incumbents, who have their own bandwidth capacity on those routes and they could even agree to exchange traffic even if monopoly pricing makes this prohibitive for independent ISPs.

A regional African IXP has been proposed. However, the ownership arrangements surrounding the present SAT-3/WASC cable, may not readily facilitate attractive access to such an IXP even for those players with a stake in the cable. If an operator does not own the capacity necessary to link to such an IXP they be faced with high charges and could easily consider transiting its traffic through Europe or North America.

Submarine cables such as SAT-3/WASC or the future EASSy Cable, have the potential to improve considerably the access to Internet in Africa, but this could be achieved only in a competitive market.

## **2.1.2 Synthesis and analysis of statistic data**

The analysis of Telecommunication/ICT services and networks development in Africa carried out below t highlights two inequalities, namely; inequality between Africa and the other continents (table 2.1); inequality between regions and countries within Africa (Tables of **Annex 3**).

### **a. Unequal Development of Telecommunication/ICT Networks and Services between Africa and the other Continents**

On the whole, while efforts are being made to bridge the digital divide in telephony, the differences in broadband services continue to widen considerably. As an illustration, Africa is the only continent where Telecommunication/ICT infrastructure and services are the least developed. Table 2.1 hereunder, established with International Telecommunication Union (ITU) data, shows the status of the indicators.

#### **i. Fixed and mobiles services**

Table 2.1 and figure 2.6.a and 2.6.b hereunder illustrate that, with 922 million inhabitants representing 14% of the total world population, Africa in 2006 had only 21% of the main fixed telephone lines of the world, i.e. 28.5 million lines. The tele-density that stood at 3 main fixed lines per 100 inhabitants is the lowest in the world. Between 2001 and 2006 the overall annual growth rate of fixed lines is 5.8% for the entire continent. This growth rate varies from one country to another and from one region to region. Notable even is the negative growth in some countries due to the very aggressive competition from mobile service operators. Moreover, Africa as at 2006 Africa had a total of 205 million mobile subscribers, representing 7.4% , of the global mobile lines, a figure far below that of other regions of the world although there has been strong growth of mobile services in Africa for well over a decade. In general, the weight of Africa in the world illustrated in figures 2.7.a and 2.7.b by all means is very low.

Indicators	Continents et the world							
	Africa	Weight of Africa in the World	Americas	Asia	Europe	Oceania	The World	
Population (en million)	2004	863.14	13.5%	877.60	3811.68	786.22	32.64	6371.26
	2006	922.03	14%	901.47	3892.77	813.64	33.37	6563.94
GDP per inhabitant (\$US)	2005	1073		18136	2916	19196	25840	6891
Fixed lines (x 000)	2004	26338.4	2.1%	293564.7	542853.3	327124.2	12631.3	1202522.1
	2006	28507.7	2.3%	292528.2	611107.5	325020	12042	1269215.1
Mobile lines (x 000)	2004	79888.6	4.5%	376014.3	716332.3	570468.4	20096.5	1763033
	2006	204994.5	7.4%	561138.5	1151517.8	807513.7	24096.4	2744250.7
Total fixed +Mobiles (x 000)	2004	106227	3.5%	669579	1259185.6	897592.6	32727.8	2965312
	2006	233502.2	5.8%	853666.7	1762624.8	1132533.7	36138.4	4018465.8
Fixed lines for 100 inhabitants	2004	3.05		33.45	14.24	40.20	38.72	15.06
	2006	3.09		32.47	15.73	39.91	36.57	19.37
Mobile Lines for 100 inhabitants	2004	9.25		42.85	18.79	72.5	61.57	22.08
	2006	22.23		62.27	29.65	99.27	72.64	41.9
Fixed + Mobile for 100 inhabitants	2004	12.3		76.29	33	114.1	73.8	46.54
	2006	25.32		94.6	45.27	139.2	98	61.2
Telecom income (in Million \$ US)	2005	37 600	2.9%	390,900	381,600	446,700	30,400	1,267.2
	2006							
Income per fixed lines (in \$ US)	2005	248	574	268	458	902	394	
	2006							
Total Investissement (in Million \$ US)	2005	8 090	4%	43,980	80,800	63,850	4,780	201,500
	2006							
Investissement per telephone line (Fixed + Mobile)	2005	74.5	701	65.6	79	144.3	71.7	
	2006							

Tableau 2.1: Statistics of Telecommunications/ICT for Africa and other Continents - Source: ITU

Main (fixed) telephone lines, world, 2006

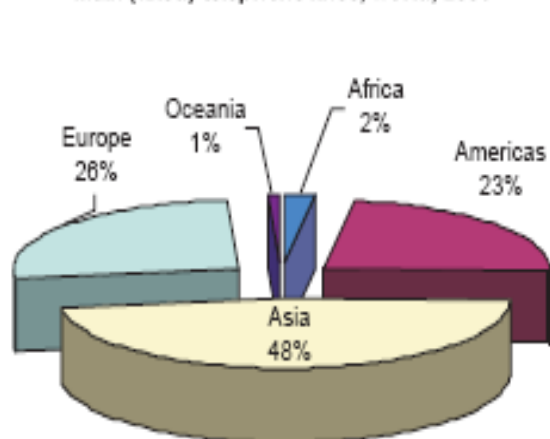


Figure 2..6.a Main fixed lines, world 2006

Main (fixed) telephone lines per 100 inhabitants, world, 1996-2006

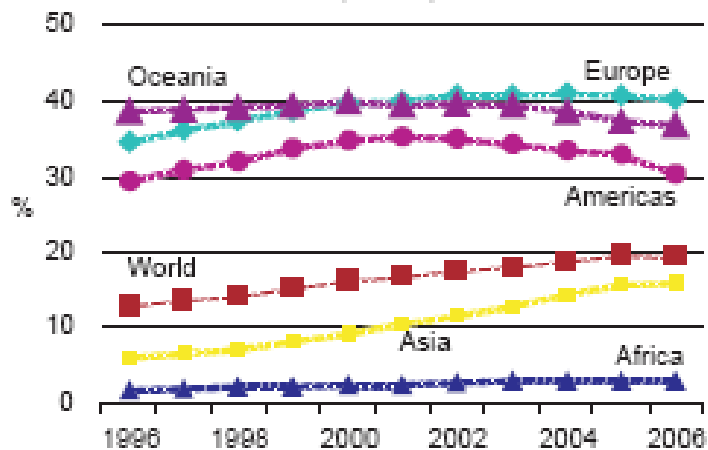


Figure 2..6.b Main fixed lines per 100 inhabitants, world 1996-2006



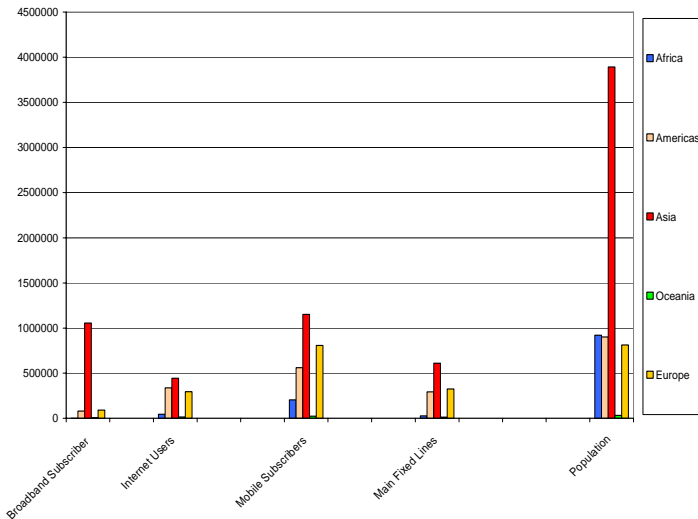


Figure 2.7.a: Africa in comparison with other world region (fixed lines, mobile, Internet and broadband. Source ITU)

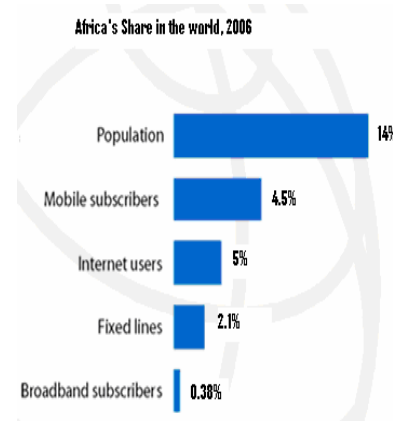


Figure: 2.7.b: Share of Africa in the World (Source ITU)

## ii. Internet Services

Figures 2.8.a and 2.8 b hereunder show Africa's position in comparison with the other continents in terms of some specific parameters of Internet development. In 2006 Africa counted 5% and 2.5% of World Internet users and subscribers respectively, which represent less than 5 users per 100 inhabitants versus the world average of 17%, 11% in Asia, 35.7 in Europe and 37% in Americas.

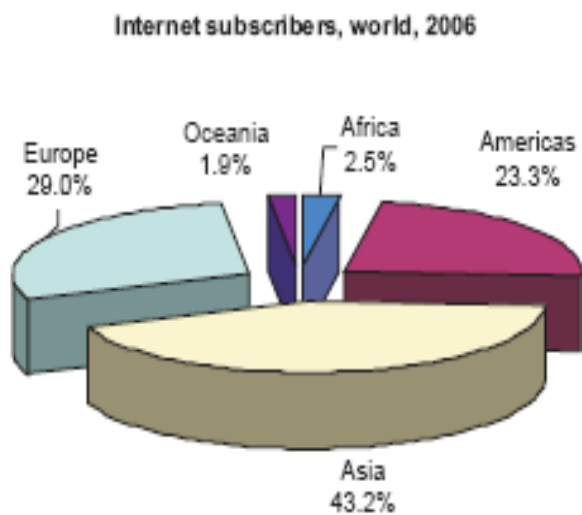


Figure: 2.8.a: Internet Subscribers 2006 (Source UIT)

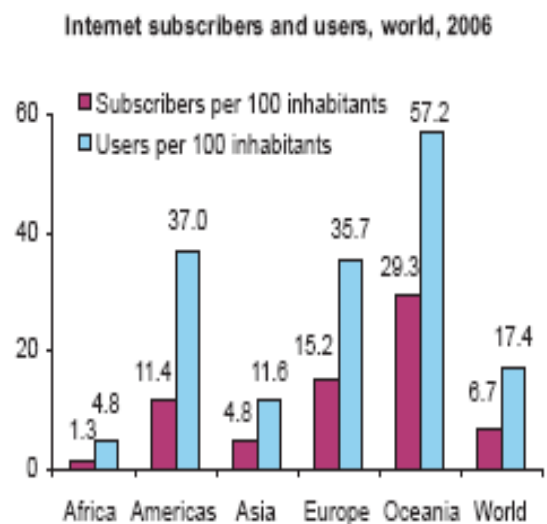


Figure: 2.8.b: 2006 Internet Users and Subscribers (Source UIT)

Within the African continent the development of Internet is unequal as shown in figures 2.9.a and 2.9.b. Most African countries have a very low Internet host count. About 68 percent of the total number of Internet hosts is concentrated in South Africa, which has 5 percent of Africa's total population.

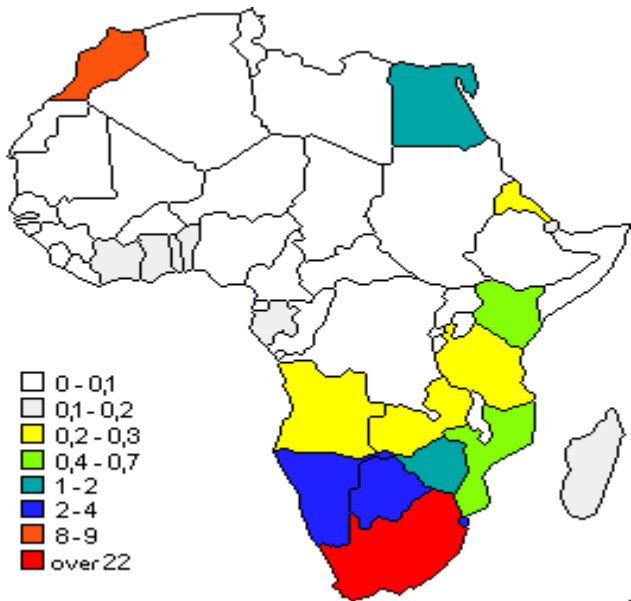


Figure 2.9.a: Internet hosts per 1000 inhabitants, (Source: Internet World Stats.com, Market research, usage and population statistics).

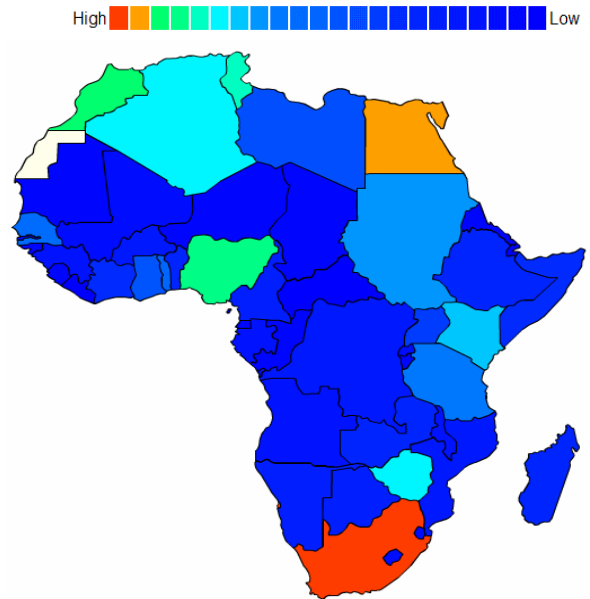


Fig 2.9.b: Relative Internet users, 2005. Source: Indexmundi.com

In term of Internet users, figure 2.9.c hereunder shows leading countries among which countries with high number of the population such as South Africa, Nigeria and Northern countries. Due to the high number of shared accounts and the high use of public access services, it is difficult to measure the total number of Internet users. While the number of dialup subscriber accounts is readily available, these figures are only a partial indicator of the size of the Internet sector.

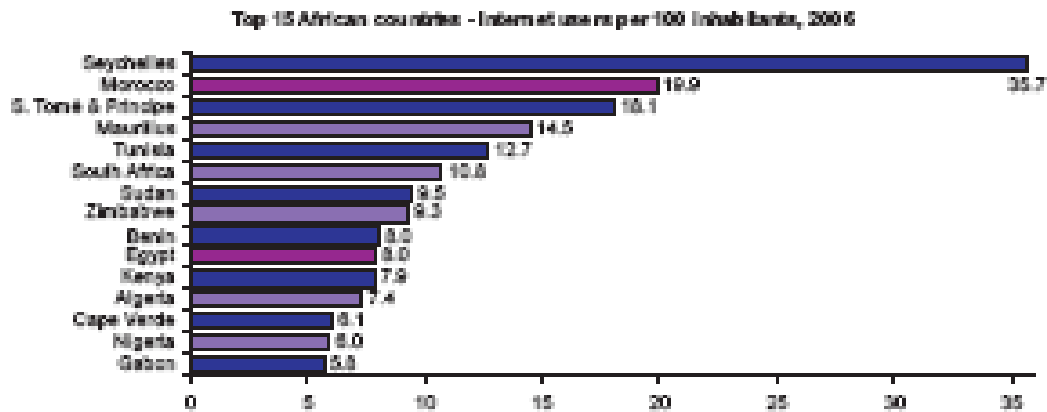


Figure : 2.9.c : 15 first countries in term of Internet Users for 100 inhabitants (Source UIT 2006)

### iii. Broadband

Broadband networks offer to individuals and groups the means to create, merge and innovate without restriction as to time or distance. These networks constitute the foundations of the Information Society and knowledge-based economy. At the moment, the majority of broadband users are found in the developed world. At global level, Asia, Europe and the Americas account for not less than 99% of overall

broadband subscriptions (see Figure 2.10.a and 2.10. b). Though, Africa is home to only a fraction (less than 1%) of broadband subscribers and that many African countries have yet to put in place broadband Internet services. Various broadband initiatives have been launched and the number of African countries offering commercial ADSL reached 21 in 2005; however, South Africa and countries of Northern Africa have more than 80% of Broadband subscribers in Africa.

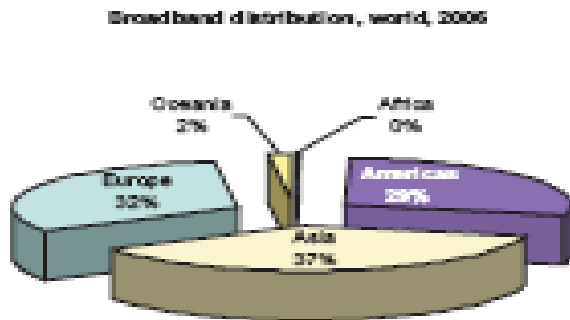


Figure 2.10.a: Distribution of broadband in the world (source UIT 2006)

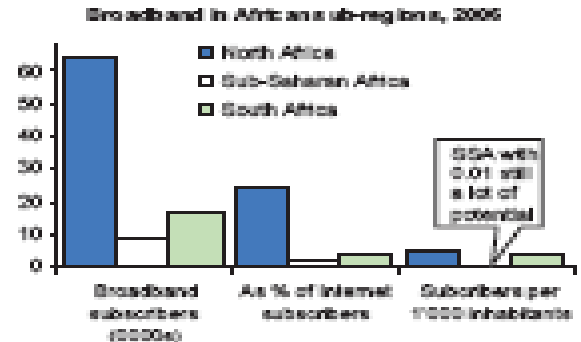


Figure 2.10.b: Broadband in the African regions (source UIT 2006)

Figure 2.11.a shows Africa connectivity data and Internet bandwidth. Big circles show place of high concentration of bandwidth. Currently, 70% of inter African traffic still transit via countries outside the continent. This has a consequence of high-level cost. Strong lines of traffic (figure 2.11.b) start from North Africa and South Africa.

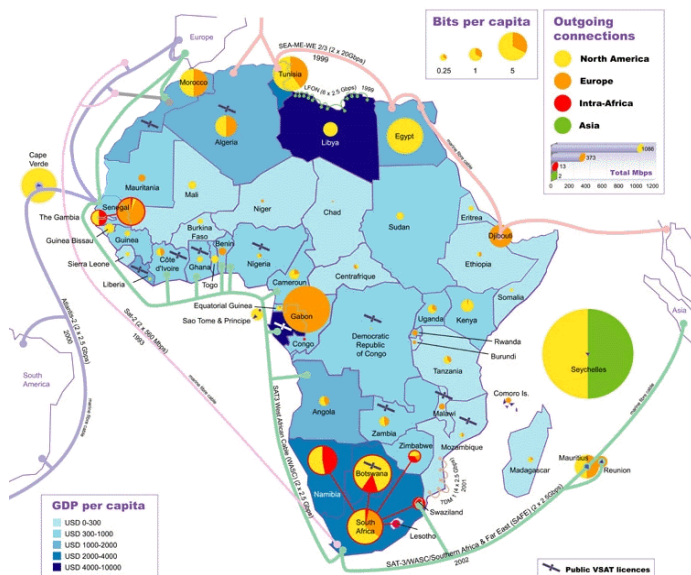


Figure 2.11.a Map of "The Internet: fiber optic connectivity: The colored circle in each country on the map shows, to exact scale, the international bandwidth in bits per capita (BPC) available in Mid 2002 from publicly accessible IP networks. Source: International Development Research Center (IDRC), CANADA

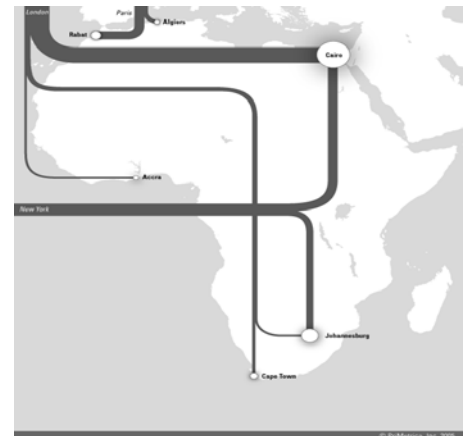


Figure 2.11.b: Internet Traffic Flow 2005 Source: Primetrica

### b. Unequal Development of Telecommunication/ICT Networks and Services in the African Continent

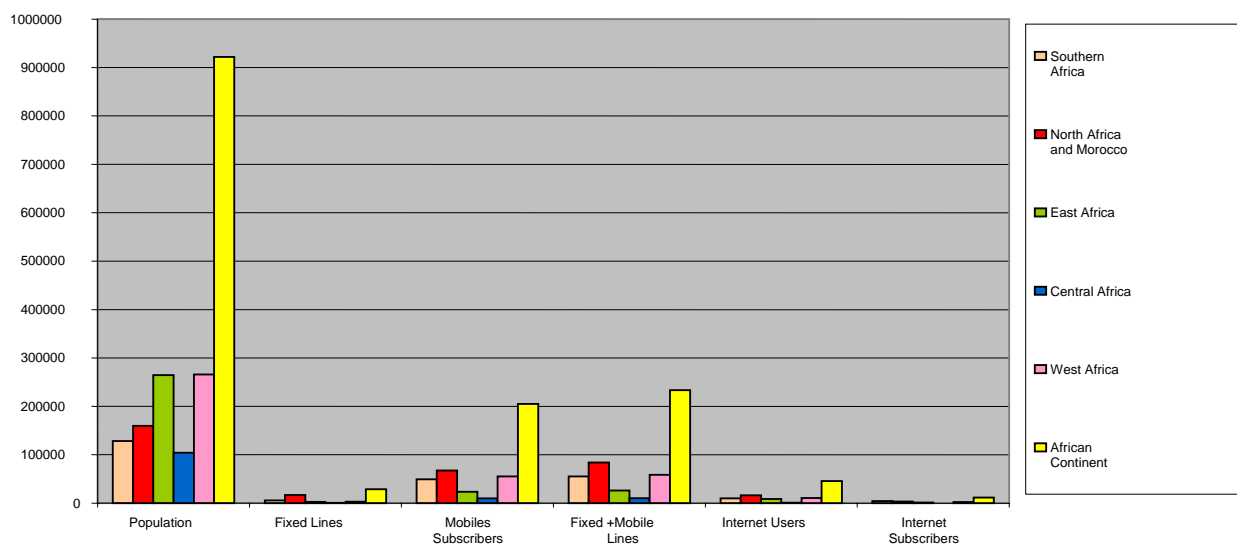
Table 2.2 and figure 2.12 below give an overview of the status of Telecommunication/ ICT in the five (5) regions of Africa.

## i. Networks and Services Development in the region and the continent

**Table : 2.2 : Statistics of de Telecom/TIC of African regions -2004 and 2006-Source UIT**

African Regions and Continent	Years	Population	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		
		(millions)	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Subscribers (x000)	User/100 Inhabts
Southern Africa	2004	122.62	5861.8	4.99	24549.3	20.02	30411.1	24.79	5090.1	3777.7	
	2006	128.29	5798.8	4.59	49133.2	38.9	54932	43.49	9771.8	4430.5	7.6
North Africa	2004	151.17	15252.2	10	26247.5	17.36	41499.7	27.45	9954	1801.2	
	2006	159.26	16701.5	10.4	67330.5	42.27	84032	52.7	16116.9	3332.3	10.1
East Africa	2004	246.74	2654.9	1.07	8493.5	3.44	11148.4	4.5	3381.9	554.3	
	2006	264.63	2612.4	0.98	23511.3	8.8	26123.7	9.8	8283.6	1306.7	3.1
Central Africa	2004	97.81	230.6	0.23	4747.9	4.85	4978.5	5.08	452.5	44.8	
	2006	104.08	264.5	0.25	9640.5	9.26	9905	9.5	871	69.3	0.83
West Africa	2004	244.8	2338.9	0.95	15850.4	6.47	18189.3	7.4	3417.9	209.4	
	2006	265.77	3130.5	1.17	55379	20.83	58509.5	22	10513.9	2168.7	3.9
African Continent	2004	863.14	26338.4	3.05	79888.6	9.25	106227	12.3	22296.4	6387.4	
	2006	922.03	28507.7	3.09	204994.5	22.23	233502.2	25.32	45557.2	11307.5	4.8

Telecom and ICT Indicators of African Regions and Continent-ITU 2006



**Figure: 2.12 Diagram of Indicators for number of lines, mobile and Internet per Region and of the continent**

## Existing Submarine Fiber Cable Systems:

- **SAT-3/WASC/SAFE**

This was commissioned in May 2002, SAT-3/WASC/SAFE cable (figure 2.13) is a consortium of 36 shareholders and it was established for the construction of the submarine optic fiber cable system. This cable system connects Europe with Africa and Asia, It has 130Gb/s capacity and will be able to carry 6.3 million simultaneous telephone calls

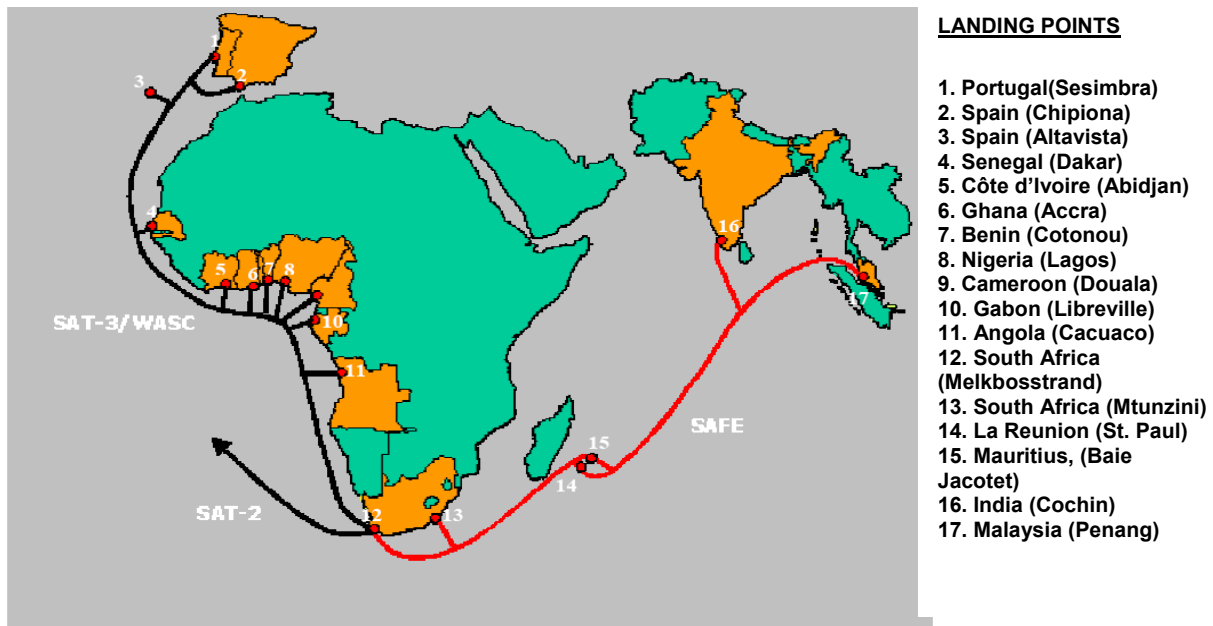


Figure : 2.13.a : Source: <http://www.safe-sat3.co.za>

- **SEA-ME-WE 2/3**

Figures 2.14.a and 2.14.b represent the SEA- ME- WE 2 launched in 1997 that aimed at connecting South East Asia, Middle East and Western Europe. Now it is connecting East Asia, South Asia, Australia, Middle East Southern, Western and Northern Europe with a Bit rate/fiber pairs of 2500/2

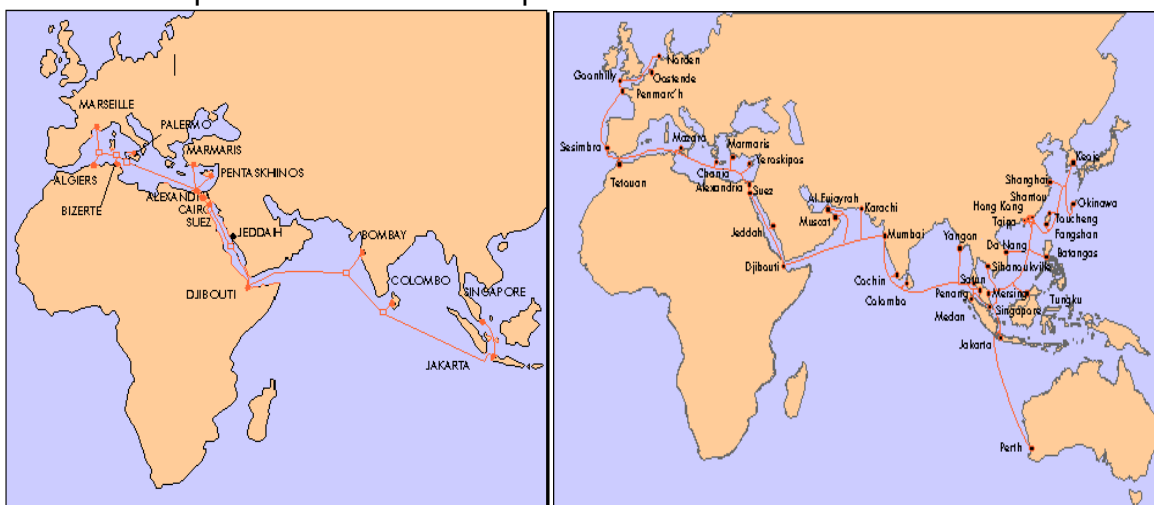


Figure: 2.14.a: SEA-ME-WE 2

Figure: 2.14.b SEA-ME-WE 3

Source: The existing fiber connectivity in Africa, Pre-study Report, **Royal Institute of Technology**, Stockholm, October 2003

- **Atlantis 2 cable**

Atlantis 2 cable (figure 2.15) is expected to provide Telecommunication/ICT services between South America and Europe. It will connect Las Toninas (Argentina) and Fortaleza (Northeast Brazil), as well as Portugal, Spain, Senegal and Cape Verde when fully operational. The 2,000 km fiber cable, which has a capacity of 40 Gbps, will be built by a consortium of 25 carriers.



Figure: 2.15: Atlantis 2 Cable - Source: The existing fiber connectivity in Africa, Pre-study Report, Royal Institute of Technology, Stockholm, October 2003

- **Aden-Djibouti**

The Aden-Djibouti backbone is equipped with two fiber pairs currently operated at 4 times 2.5 Gbit/s and was to be upgraded to 8 times 2.5 Gbit/s by the end of 2000 with Bit rate/fibre pairs of 622/3 .

**Satellite Coverage:**

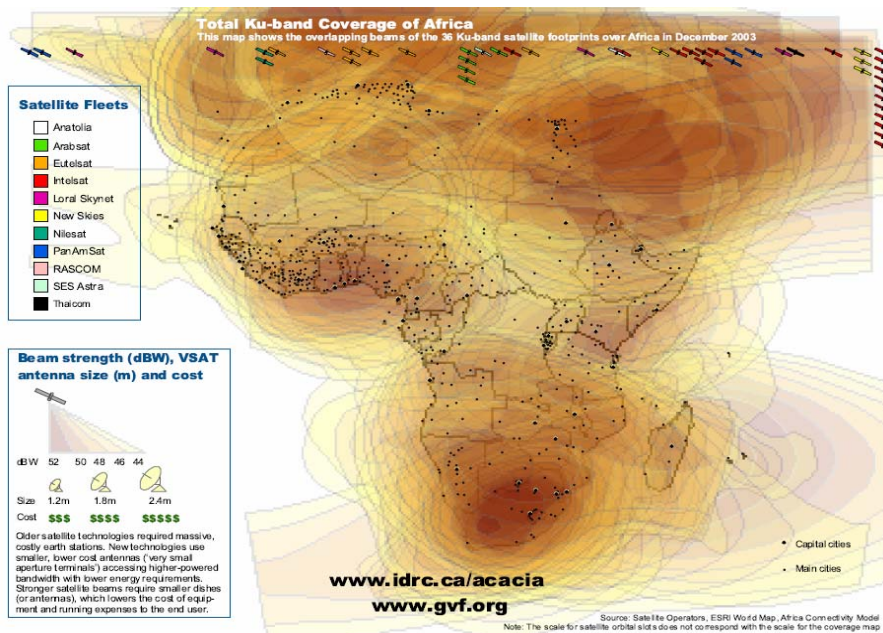


Figure: 2.16. Coverage for Total Ku band Satellite coverage of Africa (DEC 2003): Source: International Development Research Center (IDRC), CANADA

In 2003, the satellite coverage (figure 2.16) is characterized by:

- Transponders usage is in the order of 500 within which 50% is used within the Sub-Saharan region.
- Around 50 satellites cover partially the African continent and carry about 800 transponders;
- The 500 booked transponders has a wholesale capacity market of about 600/700 M\$ a year.
- 80% of voice and data traffic in Africa is carried by satellite.

## **ii. Synoptic Analysis of Networks and Services Development by region**

The following analysis is based on the year 2006 statistics of the International Telecommunications Union compiled according to the needs of the study:

### **Southern Africa**

The Southern Africa region's telephone density is described below;

- Main fixed lines per 100 inhabitants: 4.59
- Mobile subscribers per 100 inhabitants: 38.9
- Fixed and mobile telephone per 100 inhabitants: 43.49
- Internet Users per 100 Inhabitants: 7.6

The Southern Africa region consists of ten (10) States and accounts for 13.9% of the population of the entire Continent. We note that 20.3% of the main fixed lines, 23.96% of mobile phone subscribers and a combined 23.5% of both fixed and mobile telephones of the Africa Continent are in this region. It is the same for 21.4% of Internet Users of the continent are in Southern Africa region. The region's Telecommunication/ICT development is dominated by the Republic of South Africa, which accounts for 37% of the population of the region, and has 81.5% of the main fixed lines, 80.7% mobile subscribers and 52.1% of Internet users in the region. It is also one of the eleven (11) African countries with a national Internet Exchange Point.

### **East Africa**

The teledensities in this region are the followings: 0.98 for main fixed lines; 38.8 for mobile phone subscribers and 9.8 of overall fixed and mobile lines. Moreover this region has 3 Internet users for 100 inhabitants. These figures fall far below the average for the entire Continent. The thirteen (13) countries of East Africa are home to 28.7% of Africa's population. With respect to the Continent's Telecommunication/ICT sector, the region's share is as follows;

- Main fixed lines: 9.1%,
- Mobile subscribers: 11.4%,
- Fixed and mobile telephones: 11.18%;
- Internet users per 100 inhabitants: 3.1%.

Of the thirteen (13) countries of the region, Kenya, Sudan, Tanzania, Mauritius and Uganda lead the development of Telecommunication/ICT.

### **Central Africa**

The average telephone density for this region is 0.25 main fixed lines; 9.26 mobile subscribers and with a combined total of 9.5 fixed and mobile telephones per 100 inhabitants. The averages of the key indicators for this region are very low compared to the continental averages. Central Africa is made up of nine (9) States, which account for 11.2% of Africa's total population. We have noted that an 0.9% of main fixed lines, 4.7% of mobile subscribers and a combined total of 4.24% for telephone (fixed and mobile) of the continent are in this region. But only 1.9% of the continent Internet users are in central Africa.

Cameroon and the Democratic Republic of Congo (DRC) claim 78.3% of the region's fixed and mobile telephone. In the DRC, mobile telephone services account for 99.7% of the country's overall fixed and mobile services. This situation seems to be unique in Africa even in many countries the number of mobile subscribers is higher than the fixed lines. The DRC is also one of the eleven (11) African countries with a national IXP.

### **North Africa and Morocco**

The following telephone densities characterize the Northern region and Morocco;

- Main fixed lines per 100 inhabitants: 10.43
- Mobile subscribers per 100 inhabitants: 42.27
- Fixed and mobile telephone per 100 inhabitants: 52.7
- Internet User per 100 Inhabitants: 10.1

The six (6) countries of Northern Africa and Morocco accounts for 17.27% of the Continent's population, and hosts 58.5% main fixed lines, 32.8% mobile subscribers and a combined total of 36% fixed and mobile telephone lines of the continent. As regards Internet, over 35% of the continent's users are in North Africa and Morocco. Of special interest is the region's dynamism including Morocco, in the field Information and Communication Technologies development characterized inter alia, by the development of telephone services, Internet and technological facilities.

### **West Africa**

Around 29% of the population of the Continent resides in the fifteen (15) countries of this region, witch have the following telephone densities:

- Main lines per 100 inhabitants: 1.17
- Mobile subscribers per 100 inhabitants: 20.83
- Fixed and mobile telephone per 100 inhabitants: 22
- Internet User per 100 Inhabitants: 3.9



With respect to the entire continent's Telecommunication/ICT sector, this region is contributing by 11% for Main fixed lines, 27% of Mobile subscribers, 25% of Fixed and mobile telephone and 23% Internet users.

In this region five countries are the leading players, namely, Nigeria, Ghana, Côte d'Ivoire and Senegal, in Telecommunication/ICT development. Nigeria is host to over half of the population, 54% of the fixed lines, 58% of the mobile subscribers and 76% of Internet users in the region. Only Nigeria and Ghana have national IXPs in the region.

### iii. Disparities of Network and Services Development between Regions and between countries

Figures 2.17 and 2.18 show respectively the share of each region and indicators for some countries. South Africa, Nigeria and Northern African countries dominate in the development of Telecommunication/ICT networks and services in the continent. The following 2006 indicators confirm this:

- The Northern African countries and the Republic of South Africa that count for 22.4% of the African population have about 72% of the 28.5 million main fixed lines and 52% of the mobile subscribers in the Continent;
- The Republic of South Africa, Nigeria, Algeria, Egypt and Morocco have each over 10 million mobile subscribers each. These five (5) countries alone account for 62% of mobile subscribers with a percentage of mobile subscriber per 100 inhabitants spanning from and 24 for Egypt and Nigeria, 62 for Algeria and 83 for South Africa;
- As regards Internet and broadband subscribers, the level of development is very unequal between the regions and the countries. The Northern African countries Morocco, and South Africa represent the main players in this area.

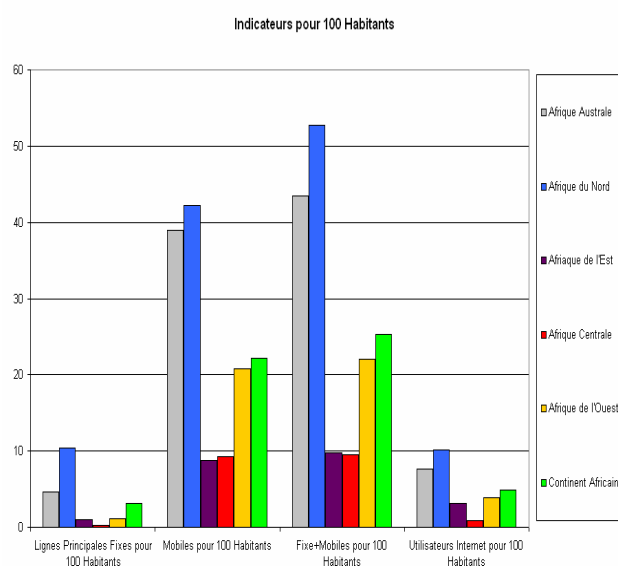


Figure 2.17: Telecom and ICT Indicators for 100 Habitants

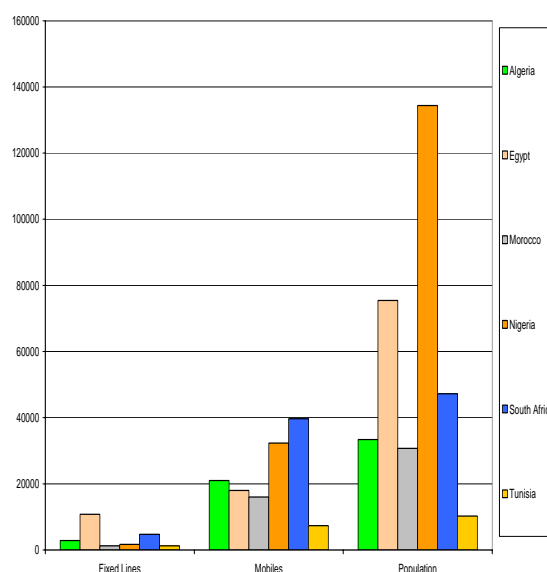


Figure 2.18 Shares for fixed main lines

The above information shows that the development of telecommunications and ICT is unequal between the regions and the countries of the Continent.

**2.1.3. On-going Regional and continental Initiatives**

Infrastructure construction, modernization and expansion of projects are being implemented at the regional level. These include the following;

**a. RASCOM Panafrican System**

It will be recalled that RASCOM, as a major Telecommunication project, with the adoption of its feasibility study by all African Administration in charge of Telecommunication in Abuja in February 1991, resulting in the creation of RASCOM Executive Organ with the Headquarter in Abidjan, Côte d'Ivoire, in May 1992. It should also be recalled that the feasibility study had as lead Agencies, the former OAU, UNECA, Member States of the OAU and the ITU, which hosted the project Office at his Head Quarters in Geneva.

The RASCOM network which coverage is shown in figure 2.19 provides direct connectivity among all African countries and connectivity with each African country through this Pan African satellite system. The RASCOM 1 satellite system built by Thales Alenia Space as part of a turnkey contract signed by RascomStar-QAF, the project Company created by RASCOM and its strategic Partners The RASCOM network will also provide fixed voice, data transmission as well as domestic and international connectivity services, band lease services, Internet services especially in rural areas in a suitable manner throughout the entire African continent with its satellite footprint coverage extending to part of southern Europe and Middle East during the satellite lifespan of 15 years. The first Panafrican Satellite system, was launched by RASCOM in December 2007, will come into commercial operations in the first quarter of 2008

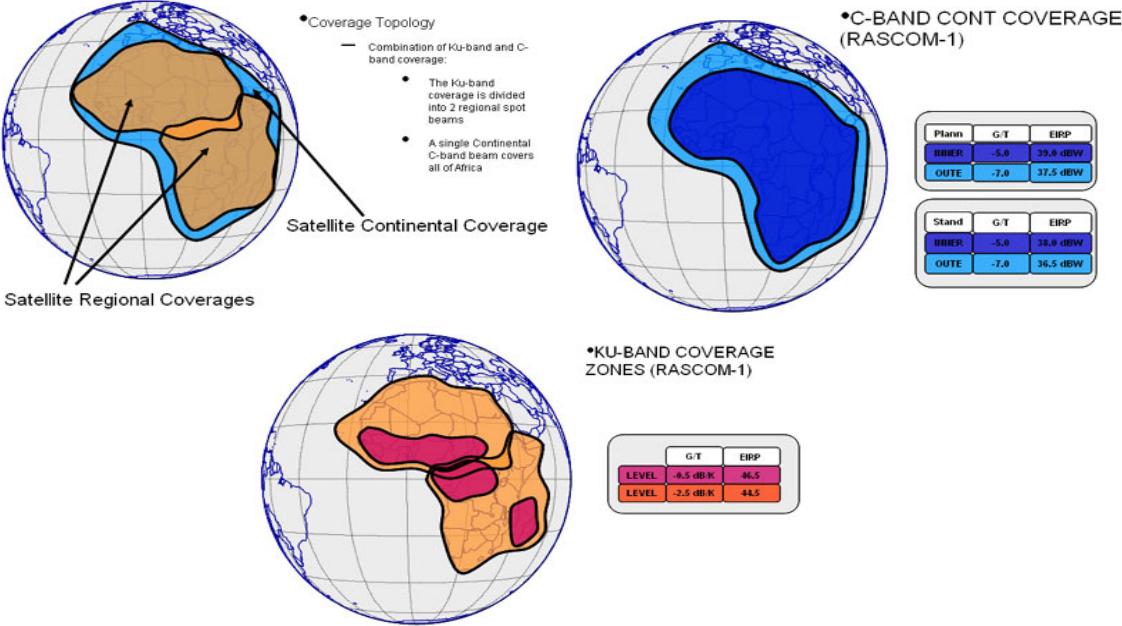


Figure: 2.19. RASCOM Coverage; Source: RASCOM

## b. COMTEL, EASSY and SATA-SRII Projects

### i. The COMTEL Project

The project entails the establishment of a privately owned regional terrestrial telecommunications network linking National Telecommunications/ICT Operators in the Eastern and Southern Africa region (COMESA Countries). The network will be built on the existing infrastructure where available but largely, new transmission routes employing a mixture of fiber-optic cable and digital microwave infrastructure will be constructed. The COMTEL project is expected to connect the following countries; Angola, Botswana, Burundi, Comoros, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Malawi, Madagascar, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Tanzania, Uganda, D R Congo, Zambia and Zimbabwe. This project should be optimized with the SRII project recall under.

### ii. East African Submarine Cable System (EASSy)

#### ▪ Background

The East African Submarine Cable System Project (EASSy) represented in figure 2.20 hereunder started a few years ago and was driven by the urgent need for the establishment of a submarine fiber-optic cable covering East Africa coast, and connecting 21 African countries among them and with the rest of the world with high-quality Internet and international telecommunication services.

The project is being implemented under the framework of public private partnership and the overall framework of NEPAD. EASSy is a partnership of 26 telecommunications operators, the majority of which are African firms. The total cost of construction is estimated at US\$235 million. Other funds are expected to come from private operators and development institutions. The project involves the Construction of 2 fiber pair collapsed ring with a Design capacity of 640Gb. Besides the deployment of a high capacity submarine cable running from Mtunzini, South Africa to Djibouti with various landing points along the coast line the project also has a terrestrial component to ensure access to the system by the landlocked countries of the region. It is expected that by end of 2008 or early 2009, the cable could be operational.



Figure: 2.20: The EASSY project and the associated backhaul networks Source: <http://eassy.org/>,

- **Protocol on the Policy and Regulatory Framework for NEPAD Broadband Infrastructure Network for Eastern and Southern Africa,**

The Protocol on the Policy and Regulatory framework for NEPAD Telecommunication/ICT Broadband Infrastructure Network is based on the Constitutive Act of the African Union. Its main objective is to facilitate and commit the Parties to the construction and operation of the NEPAD Telecommunication/ICT Broadband Infrastructure Network for Eastern and Southern Africa on Open Access principles. It further aims at providing for the formation of Special Purpose Vehicles to own, operate, and maintain the Submarine (EASSy) cable and the Terrestrial network. The Protocol commits Signatories to harmonize their national policy and regulatory instruments to facilitate the speedy formation and operation of these open access networks, irrespective of who owns them. An overriding policy objective is to ensure that the networks are constructed, owned, operated and maintained in line with NEPAD Objectives and Principles, as well as Open Access Principles.

**iii. SRII Terrestrial project**

SRII is a SADC Region Information Infrastructure project (Figure 2.21) that connects SADC region links countries with digital terrestrial backhaul links, either fiber optic or microwave links. The ITU/BDT and the African Development Bank performed the feasibility study. These terrestrial links will complement the EASSY project to provide broadband connectivity to SADC countries and in particular the land-locked countries.

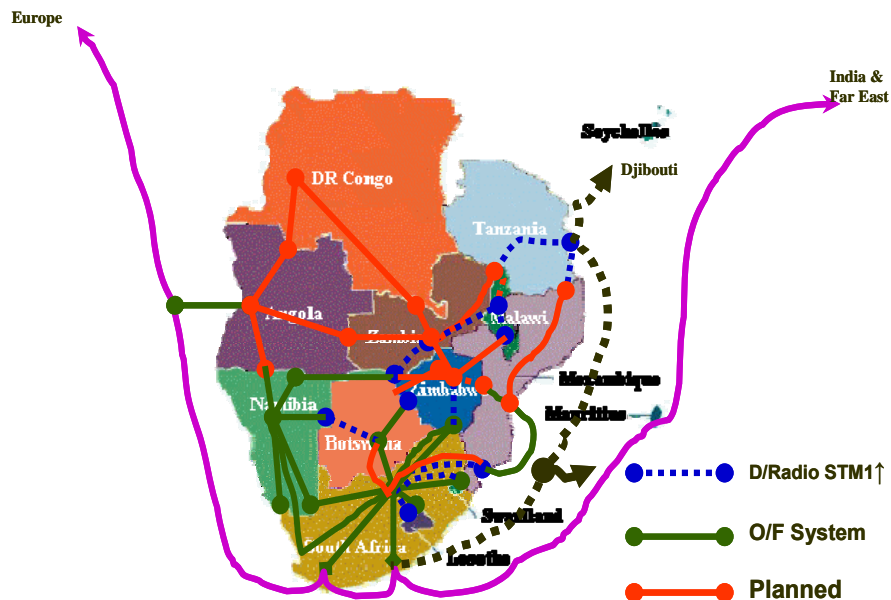


Figure: 2.21: The SRII project: Source: Southern African Telecommunication Association

### c. Central African broadband Networks projects

#### i. The Central Africa Broadband Backbone (CAB) project

The CAB project is a terrestrial broadband telecoms infrastructure/network carried by Cameroon, Chad and Central African Republic (CAR). It will not only ensure the connection of Chad and CAR to SAT-3, the interconnection of public telecoms/ICT networks and the offer of transport and interconnection transmission capacities to national networks operators, but also be the central part of the terrestrial Pan-African backbone thanks to its connection to Western region (through Nigeria) and Eastern region (through Sudan) backbones. The feasibility studies are at the final stage.

#### ii. The Festoon project

The festoon project entails the establishment of a submarine optical fibre cable to connect 6 central African countries (Angola, Cameroon, Congo, DRC, Equatorial Guinea, Gabon) to each other, 3 central African countries (Congo, DRC, Equatorial Guinea) to SAT-3 and the central African Region to Western Region through Nigeria and Southern Region through Angola. This project is complementary to the CAB project.

### d. NEPAD Broadband Networks projects

The map (Figure 2.22) hereunder shows NEPAD broadband objectives coming from the preliminary assistance study of the ITU.

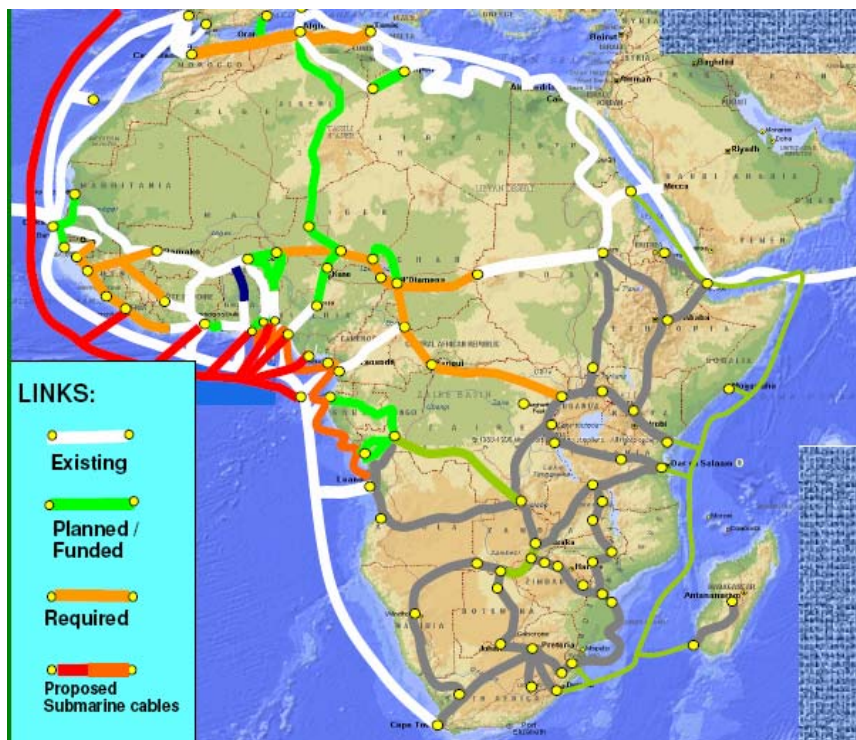


Figure: 2.22: The proposed NEPAD Telecommunication/ICT Broadband Infrastructure Network for West, Central, and North Africa. Source: The NEPAD ICT Programme

## **e. African Union and African Telecommunication Union Initiatives**

### **i. Creation of a Single Cross Border and Multi-Service SIM Card in Africa**

The objective of this project is to create a SIM Card for use in all African countries and offering several services that will include;

- Uninterrupted GSM cellular mobile telephony service by using a single number to receive or make calls, from one country to another within the same region or at the continental level or within the same group of multi-national operators;
- Calling cards with access through a Pan-Africa free of charge number.

The project will promote the establishment of a pan-Africa integrated multi-service network offering reasonable tariffs and boosting commercial transactions and integration at regional and continental levels.

### **ii. The e-Post Africa Project**

Considering the global pressure on the postal and parcel industry to improve and provide innovative services while cutting down on costs, the use of Telecommunication/ICT has become a necessity and Telecommunication/ICT / are a potential solution to meet successfully postal sector challenges in Africa. The e-Post project was initiated by African Telecommunication Union to address these challenges.

### **iii. Establishment of a Unified African Telecommunications Numbering Space (ATNS)**

The objectives of this project is,

- To interest operators to build regional integrated networks with African Internet exchange points;
- To foster and speed up the harmonization of Telecommunication policies;
- To strengthen interconnectivity of networks and promote the implementation of pan-African services;
- To serve as a powerful of African unity and integration;
- To help strengthen cooperation among Telecommunication/ICT regulators as well as among policy and regulatory organs;
- To help increase competition and boost the African Telecommunication/ICT services market; and
- To help reduce the digital divide and implement the World Summit on the Information Society (WSIS) Plan of Action. 2003 Geneva.

### **iv. Pan-African e-Network**

The Pan-African e-Network composed (Figure 2.23) with fibre optic and satellite is intended to provide the 53 Member States of the African Union with Tele-education and Tele-medicine services. The network will comprise;

- 1 Terrestrial Hub Station;

- 53 VSAT stations for Tele-medicine, installed in 53 national hospitals (1 hospital in each Member State); and 53 VSAT stations for Tele-education, installed in 53 national universities (1 university in each Member State);
- 53 VSAT Stations for VVIP communications;
- 5 VSAT stations in 5 African universities known as regional lead universities<sup>4</sup> and 5 VSAT stations in five (5) African hospitals known as Super Specialist Regional Hospitals<sup>5</sup> that would help provide the network's Tele-education and Tele-medicine services.

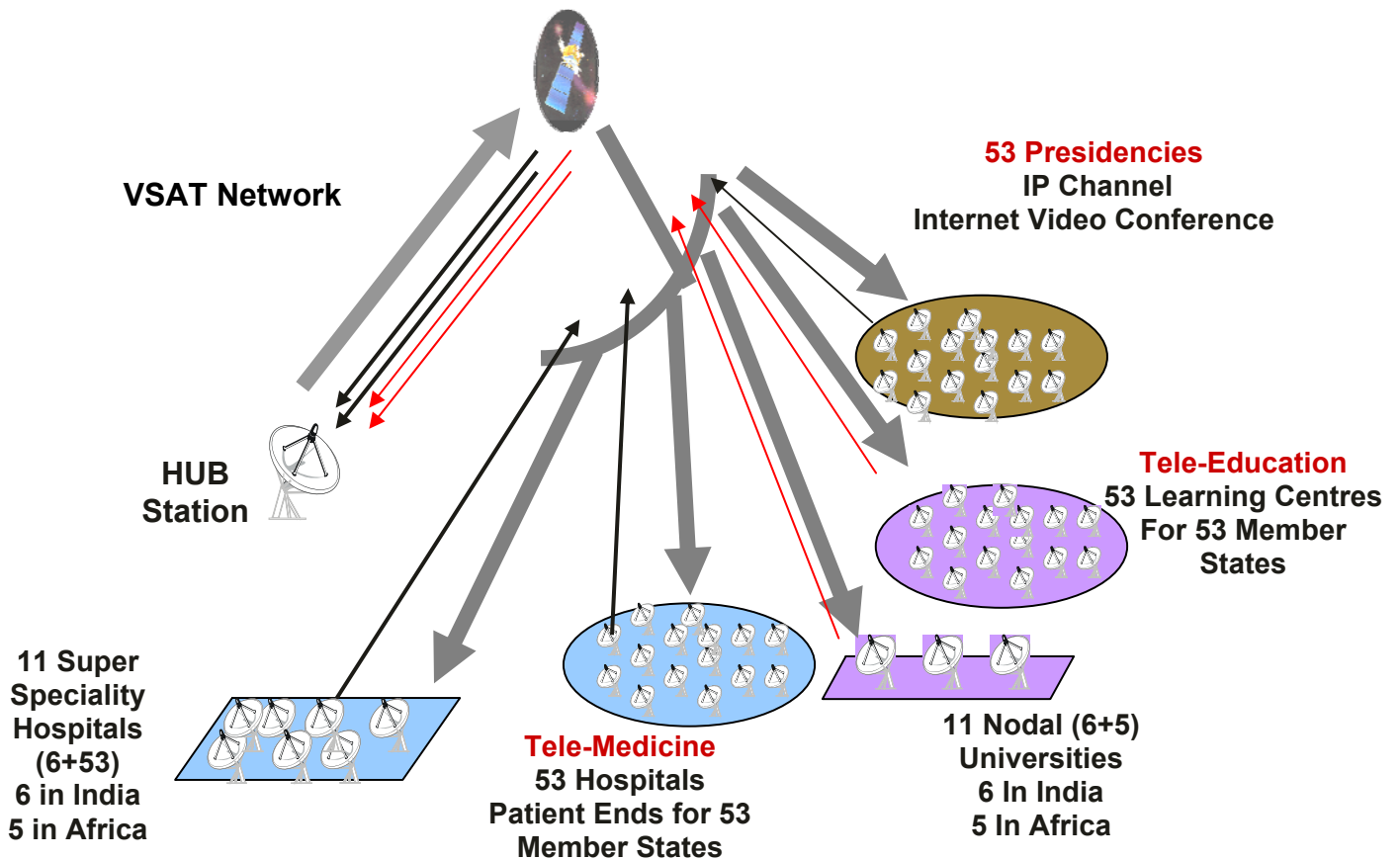


Figure 2.23 :Panafrican e-Network Structure

<sup>4</sup> Regional Lead Universities: In terms of the project, such universities will be selected in accordance with established criteria and will each have a studio for dispensing distance teaching to the 53 universities in the 53 States.

<sup>5</sup> Super Specialist Regional Hospitals: in terms of the project, such Hospitals will be selected in accordance with established criteria and will provide distance medicare to 53 Hospitals in 53 States.

## 2.2. Policies and Regulation Frameworks: major trends

### 2.2.1. General Information

#### a. Historical Background

Competition was introduced in developing countries with the objective of driving down tariffs and promoting diversified quality service delivery to users and to relieve the public sector from the burden of the investment in this sector as per Breton Woods Institutions Recommendations. In the 90's, many African countries decided to introduce competition in their operation of public networks without first carrying out indebt analysis of the situation and defining the objectives of the process. Thus, in contrast to what happens in developed countries, competition was introduced in many African countries without fixed telephone infrastructure across the country and with telephone density of less than one line per 100 inhabitants. Besides, these countries, prodded by the Breton Woods Institutions, wasted no time in embracing privatisation and the operation of fixed telephone networks, a process which led to the discontinuation of the investments hitherto provided by these countries.

#### b. The New Vision in the sector

The new vision consists in changing telecommunications rules and policies to attract appropriate and sustainable investment while maintaining effective and healthy competition.

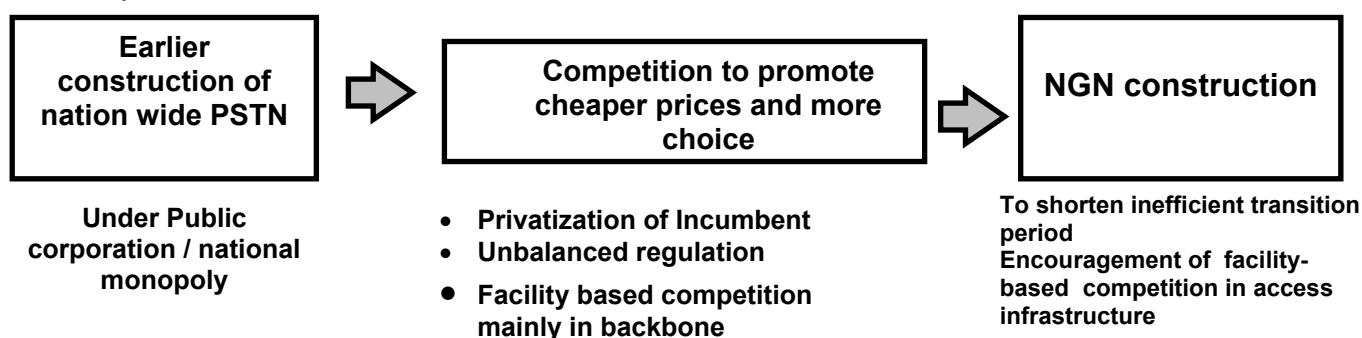


Figure 2.24: Policy Trends in the Sector

### 2.2.2. At countries level

To develop the sector, restructuring policies were implemented in many countries often with the assistance of international partners (ITU, World Bank, etc). Such policies were generally characterized by;

- Separation of the regulatory function from the functions of network operators and service providers, and the creation of regulatory agencies whose status as at the end of 2004 as presented in Figure 2.25;
- Liberalization, with introduction of competition in the activities of network operators and service providers and in the service market, including in some



countries, and the granting of a second fixed line license. Competitions in most cases generally involve networks and services open to the public, namely: national and international fixed telephony networks and services, mobile cellular phone networks and services as well as Internet/data networks and services. The degree of openness to competition varies according to countries and the type of market;

- Privatization and opening of the capital of the traditional operators.
- Formulation by Governments of National Information and Communication Infrastructure (NICI) Plan and e-strategies aimed at applying Telecommunication/ICT potentials in achieving development objectives; and
- Formulation and execution of Telecommunication/ICT projects for application to national development priorities; for example, in the areas of education, health, trade and governance.

Nowadays, however, the focus is on the definition of policies, as well as the formulation and implementation of a “broadband” strategy.

### i. Regulation trends

Figure 2.25 give the situation of regulatory agencies in 2004. At the in of 2006 the situation is different from this since some changes happened meanwhile.

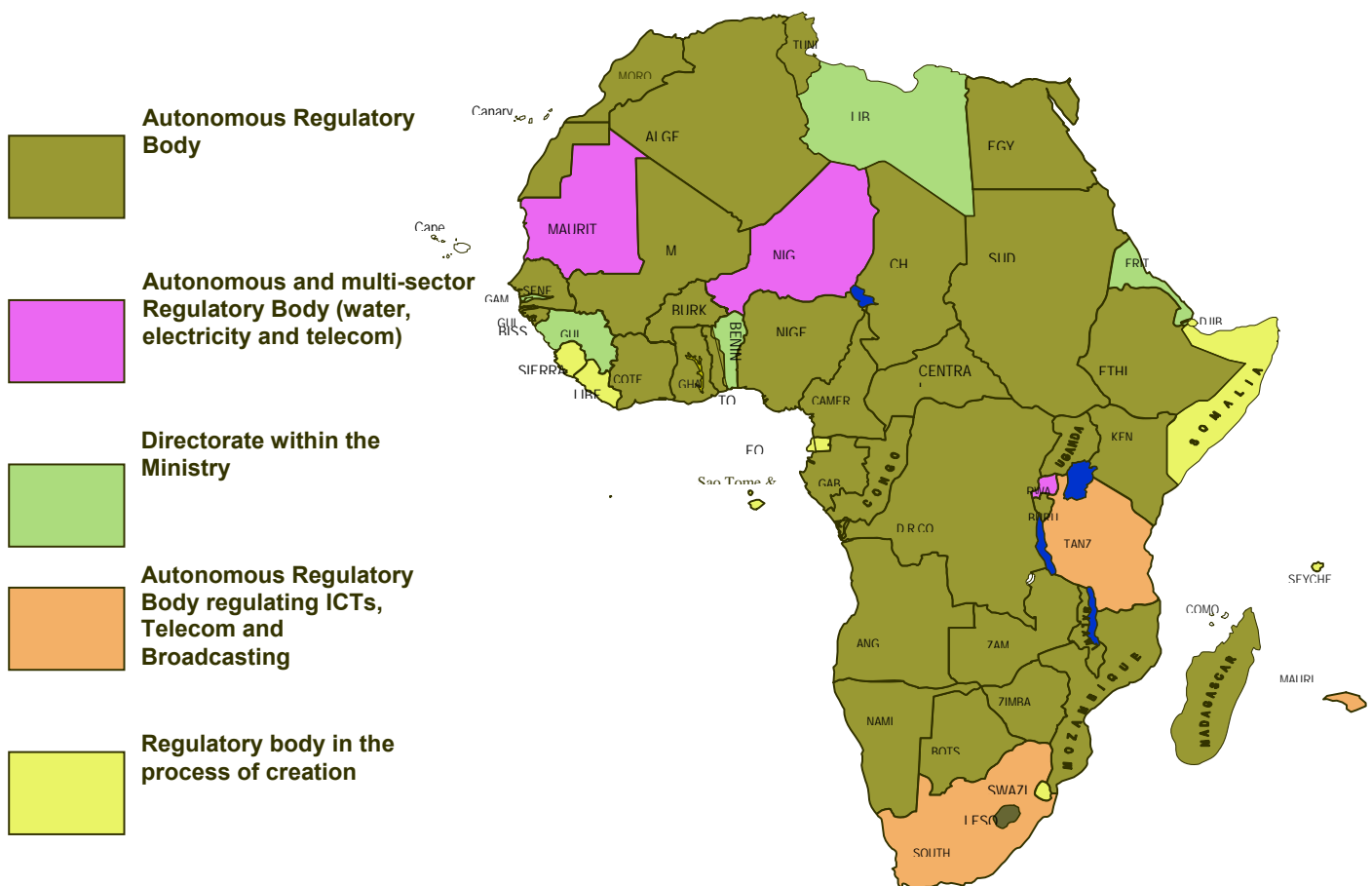


Figure 2.25: Regulatory Agencies, 2004 – Source: ITU

## ii. Privatization trends

Figures 2.26.a and 2.6.b hereunder present the situation of the competition. One notes that in 2007 the number of private operators is more than the number of state (public) operators.

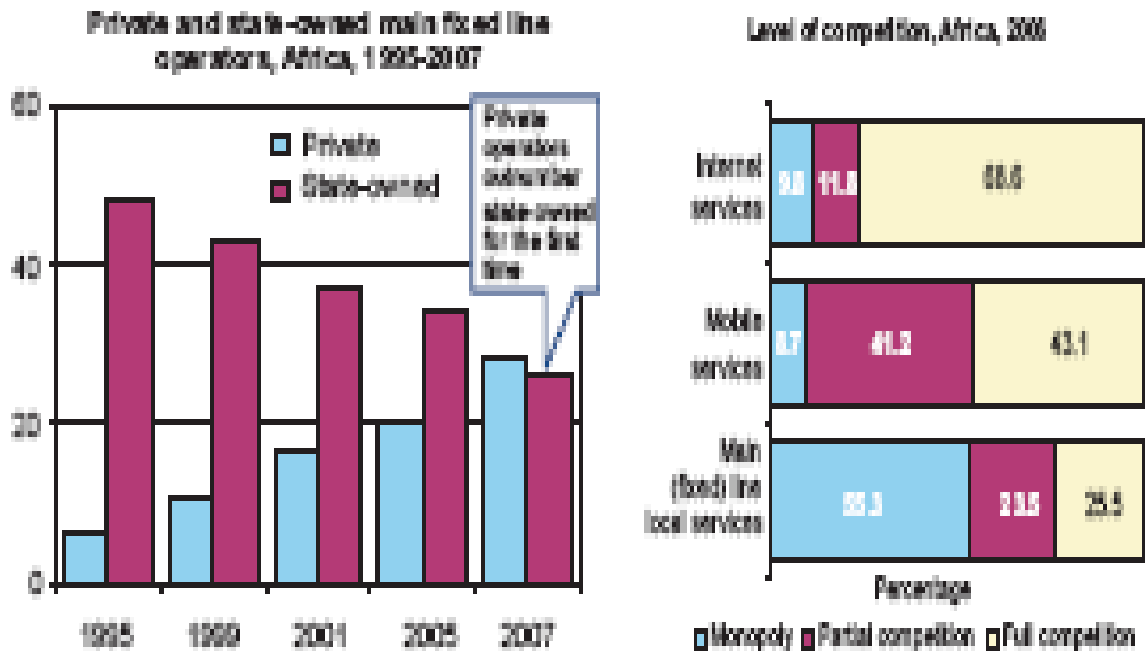


Figure 2.26.a: Private and Public Operators of fixed service in Africa-Evolution from 1995 to 2007-Source UIT

Figure 2.26.b: Level of Competition in Africa in 2006-Source UIT

### 2.2.3. At the level of Regional Economic Communities

#### i. Review of Current regulatory Associations

The establishment of regional regulatory associations the continent clearly shows the need for RECs and regulatory Associations in particular to learn from each other and to help themselves mutually, inter alia by sharing their experiences, the harmonization of their policy and dealing with legal and regulatory issues. In addition this approach allows them to share answer on the emerging challenges which appear in the sector and promote sustainable development of Telecommunication/ICT markets as well as new technologies on a global basis. Some of the already established and notable Telecommunication/ICT regulatory associations in Africa are listed in the following table:.

<b>Table: 2.4: Regulatory Association/ Organization</b>		
<b>Name of Regulatory Association/ Organization</b>	<b>Region/ Sub-Region</b>	<b>Year of Establishment</b>
Communications Regulators Association of Southern Africa (CRASA) former (Telecommunications Regulators Association of Southern Africa: TRASA) (SADC)	Southern Africa	1997
West Africa Telecommunications Regulators' Association (WATRA) (ECOWAS)	West Africa	2002
Association of Regulators for Information and Communication Services of Eastern and Southern Africa (ARICEA) (COMESA)	Eastern & Southern Africa	2003
East African Regulatory Post and Telecommunications Organization (EARPTO) (EAC)	Eastern Africa	2000
Réseau Francophone de la Régulation des Télécommunications (FRATEL)	Francophone Countries	2003
Association des Régulateurs de Télécommunications de l'Afrique Centrale (ARTAC) ECCAS	Central Africa	2004
African Telecommunication Regulators Network (ATRN)	Africa	2003
Arab Network for Regulatory Commissions of Telecommunications and Information Technology Sector	Arab Countries	2003
Africa Forum for Utility Regulation (AFUR)	Africa	2002

**Table: 2.5: Synopsis of the commonalities and differences in membership, mandates and ways of functioning of the various ICT Associations in the African Continent**

Table: 2.5: Synopsis of the commonalities and differences in membership, mandates and ways of functioning of the various ICT Associations in the African Continent						
Issue		ARICEA (COMESA)	CRASA (SADC)	WATRA (ECOWAS)	EARPO (EAC)	Arab Regulators Network
Membership Status	Policy Makers	Policy Makers Not Members	Policy Makers Not Members	Policy Makers Not Members	Policy Makers Not Members	Policy Makers Members
	Regulators	Angola, Burundi, Comoros, DRC Djibouti, Egypt Eritrea, Ethiopia, Kenya Madagascar, Malawi, Mauritius Namibia, Rwanda Seychelles, Sudan Swaziland, Uganda Zambia, Zimbabwe	Angola, Botswana DRC, Lesotho Malawi, Mauritius, Mozambique Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe	Benin Burkina Faso Cape Verde Cote d'Ivoire The Gambia Ghana, Guinea Guinea Bissau Liberia, Mali, Niger, Nigeria Senegal Sierra-Leone Togo	Kenya, Tanzania Uganda	African countries :  Algeria Egypt Libya Marocco Tunisia Mauritania Soudan  Non African Countries
	Operators	Operators Not Members	Operators Not Members	Operators Not Members	Operators Not Members	
Summary of Objectives and Functions		Exchange ideas, views and experiences among members.	Exchange ideas, views and experiences on regulation	Encourage modern institutional framework	Forum to harmonize policies & regulations	Coordination
		Promote the sustainable development and application of efficient, adequate and cost-effective ICT networks and services in the sub-region;	Promote cost-effective telecommunications networks and services	Harmonize regulations	Contribute to policy formulation	Decisions and recommendation contributing to harmonization
		Coordinate cross-border regulatory issues on ICTs in the sub-region;	Facilitate uniform level of understanding of regulatory matters	Encourage efficiency & cost effectiveness	Promote universal access	Tariffs Working group
		Contribute to the achievement of sub-regional and regional integration	Maximize the utilization of scarce resources	Develop universal services policies	Promote fair competition	
		Promote the maximisation of the utilisation of scarce resources in the ICTs secto	HRD	Forum for exchanging views & experiences	Promote regional investments	Spectrum working group
				Contribute to policy formulation	Promote common standards	
				ote market integration ote common standards	Promote cross-boarder interconnection	
				Promote common standards	Develop regional common proposals to international forum	
				HRD	HRD	
				promote cross border connectivity		

According to an ITU report on regional regulatory associations, a common feature among all these associations is that most if not all have similar objectives that include, inter alia, the following:

- Harmonization of Telecommunication Policies and Regulations;
- Development of model guidelines of Telecommunication/ICT legislations,
- Exchange of ideas, views and experiences on all aspects of Telecommunication/ICT regulation;
- Promotion of efficient, adequate and cost effective telecom networks;
- Harmonization and maximization of the utilization of scarce resources – Electromagnetic spectrum, numbering etc.;
- Identification and sharing of best practices within the region;
- Promotion of Human Resource Development and
- Contribution to the integration of their regions.

The report further indicates that several of the associations have developed, or are in the process of developing model guidelines on key issues such as those of interconnection, licensing, tariffs, universal access, regional frequency band plans etc. However, the status of common or harmonized regulatory policies and provisions differs sharply between the RECs and the regions. In the area of policy and regulatory frameworks harmonization, significant progress has been made in some regions, while a lot remains to be done in others. The specific situation in each region is as shown below:

## **ii. Main achievements**

### **CRASA (Ex TRASA)**

- Policy Guidelines on Interconnection and Model Telecommunication Regulations on Interconnection
- Regional Frequency Allocation Plan
- Universal Service Policy Guidelines, 2002
- Licensing Policy Guidelines, 2002
- Fair competition guidelines study report,
- Development of interconnection Guidelines
- Tariff Guidelines
- Model Tariff Regulations
- Recommendations for effective Regulation and structures
- Regulatory Accounting Guidelines
- Administrative Rules and procedures Template for Regulators
- Model Telecom Bill of Law

## **EARPTO (IGAD & EAC)**

The East African Community (EAC) countries have agreed on the following development or activities on the harmonization of Telecommunication/ICT at regional level:

- Development of a Regional e-Government Framework for EAC
- Development of a Harmonised ICT Policy Framework for East African Community;
- Regional Information and Communications Technology Support Programme (RICTSP);
- Study on Harmonisation of EAC Communications Regulatory Strategy;

The main achievements of this Regulatory organization include the following;

- Co-ordination of the Universal Access activities for example the East African Fiber Optic Project,
- Harmonization of the frequency spectrum prices and licensing of satellite services in the Region.
- Cross boarder connectivity and interconnection issues.

## **WATRA (ECOWAS)**

A common Market space has been adopted in the framework of OHADA<sup>6</sup>. For ICT sector the following guidelines were developed with the support of ITU, ECA and European Union.

- Decision on Telecommunication/ICT model policy
- Decision on access and interconnection regulation
- Decision on issuance of licenses
- Decision on numbering plans management
- Decision on spectrum management
- Decision on universal service/access

## **Arab Telecommunication Regulators Network**

North African countries are working closely with the other Arab countries within the framework of several structures, notably: the Council of Arab Ministers responsible for ICT, Arab Telecommunication Regulators Network established in compliance with the final Declaration at the first workshop of Telecommunication Regulatory Commissions in the Arab Region held in Algiers 19 – 21 April 2003. Regarding a common policy for the region, it would appear that priority is accorded to the directives issued by the Council of Arab ICT Ministers, which are expected to be implemented by each member state in its own territory. The major texts adopted in relation to policy harmonization at the AMU level or in the Arab region (as defined by

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<sup>6</sup> Organisation pour l'Harmonisation en Afrique du Droit des Affaires (Organization of Business Law in Africa)

the Council of the Arab ICT ministers, the Arab Spectrum Working Group, the Tariff Group, AREGNET) are as follows:

- Decision on the ICT Arab Strategic Plan.
- Recommendations on: Spectrum Management; Licensing; competition; Interconnection; Tariffs; standardization; Universal Service; Type Approval; Dispute Resolution; Health and Safety; ICT Terminology.

However, till to-date North African Countries has no binding commitment on applying these recommendations, except for individual countries participating in other REC not belonging entirely to the North African Region, e.g Egypt as member of the COMESA (ARCEA), which has adopted model policies and Regulatory guidelines,

### **ARECEA (COMESA)**

ARICEA's main achievements are in the establishment of model guidelines on interconnection, Universal Access and several activities in capacity building.

### **ARTAC (ECCAS)**

This Association was established in November 2004 have not jet major achievements. It objectives are:

- To encourage the implementation of modern telecommunications legislative and regulatory frameworks in the member countries (i.e. implementation of independent regulators, introduction of liberalization and competition, promotion of universal access, regional market integration, capacity building).
- To promote the harmonization of regional legislative and regulatory frameworks and technical standards.
- To promote the sharing of information and experiences.
- To conceive and implement a regional telecommunication master plan for the modernization of ICT services in the region.

### **Protocol for NEPAD Telecommunication/ICT Infrastructure**

Protocol of High Level Policy and Regulatory framework for NEPAD Telecommunication/ICT broadband infrastructure network for Eastern and Southern Africa

#### **2.2.4. At the Continental level**

AT the continental level, there is no reference framework for telecommunications /ICT policy and regulatory framework approved by the States. However a study by the ITU "Forum on telecommunications Regulations in Africa", has proposed the creation of an "African telecommunication Regulators' Association" to provide inputs to the policy making process at the continental level. Instead of an Association, an African Telecommunication Regulator's Network was created.

## **2.3. Major Challenges to be Addressed**

### **2.3.1. Challenges and Relevant Issues**

#### **a. Infrastructure Gaps**

Studies have highlighted the fact that the situation of the sector in the region does not allow Africa to harness the opportunities offered by Telecommunication/ICT. The development of mobile telephony networks has been immensely beneficial to the countries of Africa, but there is still a lot to be done to ensure access to Telecommunication/ICT and their use by all. Large scale dissemination of Telecommunication/ICT will depend on the capacity to resolve the numerous challenges that arise at the continental, regional and national levels. Countries are faced with infrastructure deficit at different levels and the origin of this deficit can be attributed to the following main reasons:

- Concentration of network infrastructure in urban area;
- Broadband Telecommunication/ICT infrastructure is as vital for urban and country planning and for socio-economic development as roads and air traffic. This reality is quite often ignored or is not sufficiently addressed by many countries;
- Broadband networks and services are almost non-existent in many countries;
- Some African countries do not always take into account the issue of profitability of initial investment in Telecommunication/ICT. The operator measures its success against the resources it derives from the sale of user right which enables it to defray investment and operational cost. As for local communities, they measure their success on the basis of the external economic gains accruing to them;
- Most part of the existing networks are circuit-based and most national transport infrastructure have narrow band;
- New Telecommunication/ICT technologies (WIFI, WIMAX, XDSL) effectively enter the access market whereas existing policies and regulations are not yet adapted for their deployment.

#### **b. Insufficient Investment**

The global Telecommunication/ICT market has seen rapid and sustained development, and it is highly competitive.

Traditionally, in developing countries, Telecommunication/ICT infrastructure financing come either from Government budgets, including revenues generated by the public operator or from donor and international financial institution (IFI) programs that support major capital infrastructure investments. But the transforming effects of the technological forces have resulted in a major shift in the financial strategies and options among Telecommunication/ICT stakeholders, towards a significantly greater reliance on private capital. So far, the bulk of telecommunications investment within African countries has been allocated to mobile networks for the following reasons:

- Shortage in core infrastructure,
- Wider population coverage at less cost,
- Partial privatization of fixed line incumbents with attached exclusivity periods, resulting in limited investment opportunities created within the fixed line market



Unfortunately, the influx of investment in most of African countries has not been sufficient to bridge the digital divide of the continent and issues that have presented impediments to investment include:

- Foreign exchange restrictions;
- Environmental restrictions;
- Labour restrictions and labour capacity;
- Tax laws and import duties;
- Local suppliers requirements;
- Inadequate legal structure;
- Small market size; and
- Competitive and legal framework.

### **c. Slow Pace of Development and Implementation of Telecommunications and ICT Policies**

There appear to be unanimity among African Governments about the benefits that telecommunications deregulation and liberalization can bring to the Telecommunication/ICT industry, and the need for policy and market reform. Telecommunication/ICT reform processes have begun in almost all African countries, but have not yet reached the implementation stage in all. Some of the reforms undertaken have yielded positive results, such as bringing in additional investments for network development. However, some of the reforms may not have created the desired effect. The privatization exercise in many countries has, contrary to expectations, not created the growth in the networks. It is to be noted that:

- The slow pace of development of Telecommunication/ICT -related policies has been a major hindrance in the continent. Opportunities to harmonize regional policies and exploit economies of scale in infrastructure rollout have been considerably delayed.
- Implementation of policies appears to be the major bottleneck at the regional level. When policies are formulated, strong emphasis needs to be placed on the implementation of the policy. In addition, increased emphasis should be placed on action-oriented research and pilot studies that will deepen the technological base and allow feedback into the policy formulation and amendment process. Also there is need to emphasis on skills development to strengthen local capacity in areas such as project management.
- There is general consensus that a number of initiatives are underway, however, the leadership structure, current organizational structure, function and capacity of those organizations need to be strengthened to facilitate the implementation process of decisions taken at the regional level. This will also address the need for more integrated structures that are a prerequisite of any Telecommunication/ICT policy.

In summary, the following have been identified as policy obstacles that slow down the development of Telecommunication/ICT infrastructure and services in some African countries and regions:

- Inadequate political will to develop Telecommunication/ICT Policies – many countries have the entire legislative framework to develop the sector on paper

but have not demonstrated the political will to implement the provisions of the legislation.

- Absence of a clearly defined strategic vision/framework for the Telecommunication/ICT sector.
- Incomplete sector reform: regulatory authorities not established even after the relevant legislation is passed or policy documents not yet finalized
- Absence of policy framework on Telecommunication/ICT that takes Convergence into account.
- Lack of strategies on e-Commerce even though attempts are made to implement e-commerce projects.
- Current laws are not attractive enough in some cases and do not constitute an environment that is conducive to the development of Telecommunication/ICT.
- Conflicting mandate/overlap of regulatory bodies e.g. telecom and broadcasting commissions, telecom and competition commissions. It is feasible in some countries today to get a TV infrastructure licence from the broadcasting regulator and use that same licence to provide internet service without recourse to the telecom regulator that has regulatory mandate on internet services.
- Lack of clarity on spectrum planning and management, taking into account sovereignty, security issues, nature of spectrum as a limited resource.
- Lack of awareness and sometimes misunderstanding of the potential of Telecommunication/ICT on the part of policy makers, parliamentarians, considering that policy directions in most cases have a significant impact in the market place
- Inadequate efforts on policy harmonization at regional level.
- Capacity constraints in policy formulation
- Lack of an established mechanism for countries to share information and experiences;

Perhaps the most important factor is the incomplete sector reform. It would appear that in some countries, sector reforms were imposed by donor agencies, without the countries themselves embracing the reforms agenda and process. This has led to half-measured and delayed implementation of the desired reforms. For example, in some countries, due to lack of political will, regulatory agencies were not established although the appropriate legal framework has been put in place.

#### **d. Weak and Ineffective Regulatory Framework**

Regulators in most of African countries have made bold decisions in a new and difficult terrain, but in most cases they played a predominantly reactive role. In terms of universal service and universal access to broader Telecommunication/ICT, opportunities to enforce universal service obligations were missed or not explored. Several reasons may account for these shortcomings:

- The low levels of human resource capacity;
- Lack of clarity in the Telecommunications laws, leading to political interference;
- Inadequate financial resources to develop capacity;

As in many developing countries, the result is a weak and ineffective regulator, which is not able to fulfill some of the licensing and regulatory functions essential to the successful realization of policy objectives.

In summary the following have been identified as regulatory obstacles that slow down the development of the Telecommunication/ICT infrastructure in some African regions.

- Absence of a clear regulatory framework in some countries: a typical case is where the Ministry responsible for Telecommunications is still responsible for Telecommunication regulatory issues
- Inadequate capacity of regulatory institutions: in most cases, the full complement of skills – technical, economic, legal and others are not available within the regulator
- Absence of Master Plans for infrastructure development;
- Many regulatory frameworks do not promote impartiality especially from the point of view of appointment of regulators, removal of regulators, ensuring that tenure of regulators are definite and the funding of regulators (absence of financial independence).
- Inadequate regulatory Guidelines on issues such as Interconnection, Tariff and Quality of service.
- Inability of regulators to enforce regulations and apply sanctions.
- Poor remuneration leading to brain drain from regulators to operators; unusual influence of dominant operators and corrupt practices.
- Lack of strategy on infrastructure sharing – there are many instances where operators build parallel infrastructure on same routes thus making it more expensive for the end users who have to ultimately pay for these investments through the end user pricing
- Overlapping mandate of regulatory authorities (in some countries there are more than one institution in the field of policy making and regulations)
- Little progress in adopting a framework that takes into account the reality of convergence

**e. Lack of Integrative Structures and inadequate Participation of Stakeholders in Policy Formulation**

Some countries have created integrative structures to ensure participation during policy development, e.g. the creation of Mozambique's Telecommunication/ICT Policy Commission, and driving the process from the Prime Minister's office, which has encouraged higher levels of synergy and integration between government departments. Namibia created a Resource Network Group (RNG) comprising of a broad cross-section of representatives from government, the private sector, NGOs and civil society. Mauritius has driven many of its Telecommunication/ICT related initiatives through the National Computer Board.

These participative approaches during the policy formulation stage laid the foundation for synergy and integration in the later stages of policy implementation. Lack of integration at the policy level may have been the result of little training offered in other sectors on Telecommunication/ICT and policy-related areas.

#### **f. Inadequate Participation at the Highest Level**

Creating interest and commitment in government, at the highest level possible, during the Telecommunication/ICT policy formulation process can eliminate many of the challenges generally encountered, such as rivalry between ministries, policy processes slanted towards the needs of one department at the expense of another, etc.

The role of a «Telecommunication/ICT champion» cannot be understated. In all cases where policy processes were initiated successfully, the strong presence of such leadership was evident like in South Africa, where the President has established an international advisory Council on ICT, in Mozambique where the process is driven from the Prime Minister's office and in Rwanda where the President himself assumes the role of the ICT champion and the development vision of the country is based on the maximum utilization of ICT in all sectors of the economy. In Egypt, the President himself took an initiative to promote affordable Internet access in the country, thus resulting in the country having high Internet penetration,

#### **g. Ineffective Provision of Universal Access**

Following the introduction of competition in the mobile market, the Incumbent operator was obliged under the Telecommunication Law to provide universal service in the form of telephone services on a nationwide basis. At the same time, in many countries, the Incumbent did not have the right to invest due to the fact that the privatization process had commenced. It was recognized in the legal instruments that universal service should be achieved not only via Incumbent, but also by seeking contributions from other operators, namely mobiles operators.

Today, it appears that terrestrial mobile network operators are realizing universal access faster and better than Incumbent. Universal Service Obligations (USOs) are related to subscriber lines, public telephone booths, and emergency communications. Mobile telephone and broadband services are excluded from the scope of USOs at this point in time (most telecommunication laws). Network infrastructure development is achieved through competition among operators. Mobile telephone services replace fixed telephone services since charges for fixed telephone line are roughly twice, for new generation.

Recognizing that the majority of the populations in African regions live in the rural areas where subsistence agricultural activities are the predominant economic occupation, the establishment of information and communications facilities in these areas will go along way in poverty alleviation as well as improvement in the general well being of majority of the people.

Ironically most of the rural areas in many African countries have no Telecommunication/ICT and/or information and communications facilities necessary to leverage the socio-economic development despite numerous pledges by local administration or authorities in this regard. This situation calls for the adoption of explicit universal access policies to address this challenge. The general concept of universal access is such that at least basic Telecommunication/ICT services should be available to virtually everyone at affordable rates, which should be geographically

uniform across the country. However, for practical purposes, there is need to broaden the definition to encompass access to services through community or institutions. The concept therefore should entail community access to publicly available, affordable and reliable information and communication facilities. These include telephony, broadcasting, Internet, postal and courier services.

Moreover, access at community and organizational level is likely to require capacity beyond basic telephone service. Governments should therefore institute measures and regulatory procedures aimed at achieving an acceptable level of universal access. Given the status of development support that play Telecommunication/ICT services, the issue of universal access is undoubtedly the most challenging and one that requires considerable attention. Enormous capital investment is required to achieve an acceptable level of Telecommunication/ICT access. The concept of universal access is also part of the process of attaining Millennium Development Goals (MDGs) through Telecommunication and Information Technologies

#### **h. Inadequacy of Policy Content and Priority Areas**

Most African countries have focused their efforts on policy that addresses infrastructure. This, in most cases, includes aspects of regulation, universal service provision, the creation of mechanisms to fund universal service rollout, the structure of markets and competition, etc.

Due to overlap with other policy areas, the need to move beyond infrastructural policy towards a more integrated and streamlined approach has to be recognized. Synergies with other policies such as economy, labour, education and migration have to be taken into account. Thus, many countries, with assistance from the Economic Commission for Africa (ECA), are conducting NICI processes, which also work towards the development of umbrella-type Telecommunication/ICT policies, which cover a broad range of areas such as creating broader use and exploitation of Telecommunication/ICT and the inclusion of sectoral applications such as education, health, agriculture, tourism, IT for Government, e-Commerce, the creation of local industry, and finally human resource development.

The need to avoid technology oriented policies must be recognized to the extent possible, since the rapid technological changes are likely to render technology-based policy redundant in the short term. Issues of technology convergence are not yet being addressed in most Telecommunication/ICT related policies, and policies still tend to be split into the traditional broadcasting and telecommunications streams. As boundaries between them become blurred, more attention will need to be paid to this area. The challenge will be to transform regulatory bodies in such a way that the difficulties of managing content and infrastructure result in a converged management approach.

#### **i. Weak Institutional Capacity at Regional and Continental Levels**

The diverse levels of Telecommunication/ICT development within African regions create challenges for Africa to meet the needs of all its member states. The ability of countries to "absorb" and use the support and guidelines that may be provided by a regional institution will depend to a large extent on national capability to assimilate such support mechanisms.

There is a gap in capacity in the various institutions that are responsible for the development of Telecommunication/ICT across the regions. This lack of resource capacity either in form of inadequate human capital or deficient institutional development have adversely affected attainment levels of reform targets and goals. Predicated upon the scarcity of financial ability, economic expertise, technical dexterity, legal skills & lack of training, is the capacity constraints manifests in most case by poor policy formulation exercises, incoherent legal frameworks and uncoordinated and ineffective regulatory frameworks. These avoidable weakness invariably result in incomplete sector reforms that end up not realizing the benefits and advantages of the much-touted liberalization revolution.

The lack of research capacity in human and financial resources as well as available research material is regarded as a major restraint in policy development. This is also evident through the number of non-African consultants involved in formulating policies. Very few institutional-strengthening activities are currently being undertaken in the regions in Telecommunication/ICT policy research.

There is need to strengthen linkages between policy formulation and policy implementation phases. Many good policies have been produced in some African regions during the last decade but have not been implemented. Unrealistic objectives and timeframes, and a lack of attention to the capacity of institutions to deliver, have resulted in a poor or average level record for delivery. Implementation strategies are not always put in place, which makes it difficult to develop longer-term action plans and targets for delivery. Likewise, at the regional level, the need to streamline activities between regional bodies has been recognized.

#### **j. Inappropriate Human Resource Development in Telecommunication/ICT**

In many countries, the lack of Telecommunication/ICT skills has been identified as one of the most critical constraints. Tertiary institutions are not providing sufficient high level graduates to meet demand, and those that do graduate often leave for better opportunities in developed countries. The brain drain has been identified as a major problem within Africa, within some countries in Africa and outside Africa acting as a magnet for African Telecommunication/ICT professionals. Telecommunication/ICT policies should therefore address incentives that encourage skilled resources to remain in their country.

Growing the Telecommunication/ICT skills base has to be tackled from two perspectives: developing a wider base of Telecommunication/ICT -literate skills in the population and thereby ensuring that learners and citizens are equipped to use Telecommunication/ICT to participate in the Information Society; and using Telecommunication/ICT-enhanced learning methodologies to reach a wider base of learners than could be reached through the one-teacher one-classroom conventional approach. The power of distance education using Telecommunication/ICT and the opportunities that convergence presents should not be underestimated.

The lack of human resources in Telecommunication/ICT in government is of particular concern, and can be partially attributed to the inability to compete with the private sector in terms of remuneration. The draft policy therefore includes several actions to stimulate Telecommunication/ICT awareness in government and citizens, and to grow the number of available graduates with Telecommunication/ICT skills.

The possibility of sharing resources and developing training programmes across the region should be addressed at the policy level.

## **k. Weak Research Capacity and Unavailability of Reliable Statistics**

In addition to the lack of policy and regulatory capacity to oversee the sector, the resource base for research in Telecommunication/ICT policy is extremely low and few researchers live in some African regions. Also, few academic institutions are devoting much attention to this area. Part of the explanation for the lack of good research institutions stems from the lack of the availability of good data, to establish benchmarks, thus making effective monitoring extremely difficult.

Alternative mechanisms for the release of data to the public could be considered in terms of disclosure of information by the national fixed-line and mobile operators. For example, the regulator could make far better use of its powers in order to establish baseline data on the sector by requiring more rigorous annual reporting by licensees. The lack of coordinated data on fulfillment of community service obligations, for example, has resulted in uncoordinated rollout efforts by the operators, donors, government departments and NGOs.

In conclusion, to reinforce the Telecommunications/ICT sector in general and enhance economic growth to the widest possible extent, it is important to be strengthening in the area of research and development.

## **I. Weak Regional Cooperation/Coordination**

Face to the need to the need to increase regional achievements, it is no longer sufficient for countries to address Telecommunication/ICT policy only at the national level. Large capital investments are required to address Africa's Telecommunication/ICT infrastructure gap, and many countries are unable to meet the challenge on their own. It is important to encourage and coordinate regional initiatives with strong participation of Member States to avoid overlaps and to ensure effectiveness.

### **2.3.2. Addressing the Challenges**

The absence of a regional market generally impacts negatively on Telecommunication/ICT development in the regions in view of the restricted size of the national markets. The development disparities in the Telecommunication/ICT sector and the insufficient interconnection infrastructure in the regions and countries constitute obstacles to regional and continental integration.

The need for wide deployment of Telecommunication/ICT in Africa generates challenges which are not only economic and social, but also, infrastructural capacity building, contents and financial in nature. Several prerequisites deemed vital for a coherent and ambitious African policy aimed at transforming the existing society into a real information society have been identified following analysis of the current situation as reflected hereunder:

#### **2.3.2.1. Establishing Enabling Environment**

##### **a. Level playing field for business**

The explosion of Telecommunication/ICT sector investment in most developing countries correlates closely with an improved environment for private investment to

take place. Business applications require reliable and high capacity communication systems that can cope with the enormous data flows and processing capacity. Such infrastructure is required in order to encourage establishment and distribution of various economic activities such as Business Processing Outsourcing (BPO) in the areas where majority of the people live as well as in rural areas.

#### **b. Telecommunication/ICT policy and regulatory frameworks**

The sector restructuring policies, which were progressively instituted by Government in the past decades, yielded generally satisfactory results, such as:

- The transformation of formerly closed, monopoly Telecommunication/ICT markets into open, equitable market environment allowing for competitive entry are generally welcomed by investors, consumers and the general public;
- The introduction and strengthening of effective sector regulation has helped to reinforce investor confidence and market performance, while enhancing consumer benefits.

However, these policies have demonstrated limitations in relation to the need to urgently mobilize further investment to implement regional and continental development and integration infrastructure.

The policy and regulatory challenge consists in creating an enabling regional environment and establishing regulations allowing for the sector's development to sustain rapid regional integration and leading to the advent of the African Information Society. What is needed, essentially, is a good understanding of the priorities as well as the technical challenges underlying the sector's development at national level, removal of barriers and stimulation of adequate investment for the development of regional Telecommunication/ICT infrastructure and services.

Another important challenge is to put in place regulatory organs empowered to fully exercise their functions together with appropriate human competences capable of implementing the promulgated regulations.

#### **c. Innovative universal access policy and regulatory frameworks**

Addressing policy barriers, removing restrictions on competitive entry by Telecommunication/ICT companies and local community network operators, and permitting the use of cost effective technologies (e.g. VoIP, and on unlicensed spectrum), and other innovative practices have been found to be helpful in moving the network frontier to address the needs of currently under-served populations. Continued cooperation between various development partners and stakeholders can also help in addressing the problems of providing rural access using new technological applications including wireless broadband devices, offering incentives to Internet cafes and community communications centres.

Whereas some Governments in the continent have made significant efforts in creating an enabling regulatory environment that has resulted in attracting numerous players in the communication sector leading to rapid deployment of Telecommunication infrastructure, the same has only been evidenced priority in the



major towns because the capitalization costs for extending services to the rural areas remain comparatively high while the potential for return on investment is relatively low hence discouraging private investments.

At the same time virtually all of the latest Telecommunication/ICT Policies within the region outline the main objectives of the sector as being the realization of availability of efficient, reliable and affordable Telecommunications services throughout their countries. It is therefore incumbent upon governments to facilitate development of Telecommunication/ICT infrastructure particularly to the rural and underserved areas in order to provide greater access to low-cost, high bandwidth Internet connections to majority of their population.

**d. Integrated e-strategies**

E-strategies, typically designed on a multi-stakeholder basis, have been important in establishing national ownership and in outlining a set of key priority areas for intervention. This also allows the deployment of Telecommunication/ICT within mainstream development strategies such as health, education, governance, poverty reduction and commerce.

**e. Relevant and valuable Telecommunication/ICT applications, services and content**

Telecommunication/ICT facilities and networks are valuable for the information and knowledge that they deliver to end-users. While there are many signs that the marketplace will eventually provide a variety of content and applications that can appeal to diverse populations, this segment has developed far more slowly than the supply of infrastructure and equipment. It would benefit from increased attention and creative initiatives across the developing world including expanding the public domain to ensure that knowledge can be disseminated where it is needed most and through providing support to community and local private sector for the development of locally adapted content.

For example, with respect to service delivery to the public by public administrations and bodies, telecommunications/ICT usage is intended to improve service quality and boost democracy and transparency. Many Governments have, today, embarked on modernization of the State. They all manifest strong political will to reform the public sector to make it more efficient. This is justified by the need to address the major challenges facing society such as the youth, unemployment and inadequate social infrastructure (health and education) while exercising control over public service expenditure and generally up-scaling the level of quality.

At this point it is useful to consider several policy challenges. Firstly, investment in Telecommunication/ICT should be stepped up: such investment should be accompanied with restructurings which are usually difficult to implement. There are also problems such as those relating to lack of interoperability of many networks, diversity of legislations and administrative practices in the countries, the problems of personal data management and the sometimes insufficient degree of reliability and security of existing networks.

The progress achieved in the area of e-government is of special significance to SMEs in view of the cumbersome administrative formalities carried out manually and physically which place them at a disadvantage. Enterprises, especially small scale,

should be able to carry out the greatest number of activities on-line. In this connection, it is possible to submit documents with authorized electronic signature.

Lastly, there is the need for the regions and the Africa Union to build the cross-border dimension of some public services. The single counter, in particular, is an example of a public service which could be instituted at regional and, indeed, continental level through mobility of persons.

Further, another challenge is the development of content and applications relating to the mainstreaming of Telecommunication/ICT in the various development sectors that are in a position to benefit from the use of Telecommunication/ICT, particularly in health, education governance, poverty reduction and commerce.

#### **f. Integration into the Information Society and Citizenship Exercise**

Policies for integration into the Information Society should be geared towards providing to everyone, equal access to Telecommunication/ICT and equal availability at affordable price. The exercise of citizenship calls for the participation of all in the society. However, the increased usage of Telecommunication/ICT in daily use poses new challenges. As a matter of fact, the advent of complex new technologies carries with it the risk of marginalizing some social categories and some segments of the society, which cannot access or/and are not able to use them. This problem of integration should be addressed at local, national and regional levels.

Governments should ensure that every person has the basic skills necessary to use Telecommunication/ICT. Integration policies should guarantee for everyone in the society a digital culture. They should find easy to use technologies and they should provide content and services with a view to avoiding new digital gaps.

#### **g. Scarce Resources Management: Frequencies and Numbering plans**

Spectrum frequencies is a scarce economic resource, reckless assignment of spectrum particularly for long term licenses is a waste of a valuable resource. A good management of the resource could help speed up the development of Telecommunication/ICT access. The advent of new wireless technologies (WIFI, WIMAX) calls for optimal management of frequency spectrum. The following two (2) approaches, among others, can be noted as an exemple.

- Sell the resource to the highest bidder, thus raising the funds part of which, at least, should logically be used to make “non profitable” regions more attractive;
- Allocate the frequency free of charge by way of “beauty contest”, but the operators will be required to ensure the best possible balance between profitable and non-profitable areas, as a quality of service is assessed on that basis (implying a rollout obligation).

Numbering is also a scarce resource. A carefully designed numbering plan should cater for new entrants as well as new technologies, some times unpredictable. As regards management of numbering plan, the objective is to ensure transparency and equal market access for operators and service providers. It is similar to spectrum assignment.

## **h. Security and Reliability**

The Internet should be reliable and secured in terms of its daily use by citizens and enterprises. Security, respect for privacy, protection of property and general good management of the sector is an imperative in inculcating in the population and enterprises confidence in the Information Society. This is particularly important given consumer fears about the integrity of their private life, dishonesty, illegal trade practices, messages with illegal and dangerous content and protection of minors.

The infrastructure required for modern day life, in the banking, finance, health, energy and transport sectors depend to a large extent on Telecommunication/ICT. Any malfunctioning could have serious consequences. At the same time, in view of the powerful means allowing access to a multitude of information on individuals and to works protected by copyright, the protection of privacy and data has become increasingly problematic. It is vital that security in its four dimensions (legal, administrative, technological and human dimensions) becomes a priority.

## **i. Number Portability**

Local Number Portability (LNP) and Mobile Number Portability (MNP) is for a customer wishing to port his/her number to contact the new provider (Recipient) who will then arrange necessary process with the old provider (Donor). Number Portability (NP) became popular with the advent of mobile telephones, since in most countries different mobile operators are provided with different area codes and, without portability, changing one's operator would require changing one's number. Introduction of the Number Portability (NP) should be a tool to promote competition between Operators in the country for the the benefit of the market and the end customer, as more competition reflects into better service levels, better marketing packages, etc..

Most of african countrie has not yet introduced the Number Portability concept. This conceptis is usually mandated for all operators by telecommunications regulatory authorities. It is then necessary to put in place guidelines to help these countries to put in place implementation strategies and plans

### **2.3.2.2 Technological convergence and Inter operability**

#### **a. Convergence**

Convergence has emerged as a result of digitization and paketization, which has allowed traditionally distinct services to be offered across a variety of platforms, enhancing such potential areas as;

- The use of broadcasting networks more extensively to deliver telephone and data services;
  - The use of Internet networks to deliver broadcasting and telephone services;
  - The use of mobile networks to offer Internet, broadcasting and data services; and
  - The use of the power grid for communications.

There is already convergence of technology, in infrastructure and in services. Emerging questions that need to be addressed include the convergence of public policy and regulation and these areas could take into account issues related to;

- Infrastructure regulation: allocation of scarce or limited resources, interconnection of networks and interoperability of receiving equipment;
- Content regulation: protection of certain cultural values, protection of democracy, protection of minors, promotion of local culture/content industry, protection of freedom of expression, protection of intellectual property etc.;
- Licensing: cross-media ownership and anti-trust regulation;
- Service regulation: ensuring equal and universal access to certain services regarded as basic, pricing, etc.
- Tracing and combating of cybercrime in all its forms (hacking, virus propagation, denial of service attacks, credit card fraud, etc.);
- e-Commerce: dispute resolution, jurisdiction rules, taxation, authentication, electronic signatures, etc.

Throughout the world technological convergence is prompting the consideration and implementation by regulators of the concept of unified licensing as a strategy in addressing the various technological and regulatory challenges. The challenges emanating from technological convergence have necessitated the review of regulatory frameworks particularly with regard to licensing, in order to make them more effective pursuant to the prevailing primary policy objectives and goals..

Convergence in technology and services has led to a situation where different services use a single access and transmission networks often based on IP technology. On the other hand there is systematic development in fixed/mobile convergence. These technological advancements have therefore led to the conclusion that the approach of licensing based on technological differences is no longer tenable.

It is under the integration of the traditionally distinct networks that many regulators are adopting a unified technology neutral licensing framework as an appropriate regulatory tool to translate the technological challenges into opportunities. Under this licensing framework, there is no distinction between, for example, mobile or fixed services, satellite or terrestrial services, data or voice services, etc. Instead licensees will be categorized based on which segment(s) of the model they operate in. It is considered that the implementation of this strategy will have positive impact and benefits to operators, consumers as well as the whole economy.

The development of convergence frameworks is in its early stage of development in most countries and regions. However, it may be easier to deploy converged networks and services in Greenfield areas, where no extensive infrastructure exist. Convergence is anticipated to result in lower cost of deployment and running cost, in addition to the possibility of offering variety of services, which will increase the Average Revenue Per User (ARPU).

## **b. Interoperability**

For operators, interoperability is the capacity to be connected to other networks. For content and service providers, interoperability is the ability to provide a service on any appropriate platform. For consumers, it means the possibility to acquire a device and use it to access services and download contents from different sources.

Generally, interoperability and the corresponding standards usually stem from economic and industrial considerations. International standards organizations, in their activities, issue recommendation and/or adopt standards on service provisioning, interoperability of networks and devices as well defining acceptable quality of service among other things. There is always fear in implementing preparatory non-standard systems, particularly in the developing countries which may give rise to dominance or monopolization. In the areas that are of particular importance to public policy, it is imperative to institute open standards. However, in special cases or special areas (e.g. rural areas), and when proprietary solution are more cost effective, relaxation of standards may be applicable. African countries should closely monitor developments in this area so as not to make Africa a test-bed or an investment pay-back pump for new non-standardized or experimental technologies.

### **2.3.2.3 Building broadband Infrastructures and reinforcement of the African Internet Network**

#### **a. Broadband Infrastructures**

Access to infrastructure and services leading to availability of several types of digital content is a prerequisite for building an African information society. Most African countries and the regions do not yet have the appropriate infrastructure and network for a meaningful information society and knowledge-based economy.

It should be noted that regional and international infrastructure Interconnection will only have value and meaning for an inclusive information society if there is appropriate national infrastructure. Establishment of continental, regional and national broadband infrastructure should be a priority, and it is vital, in this regard, to point out that many African countries are landlocked and therefore, are unable to have direct access to the submarine cables resources. For these countries, it is important that there is equitable and guaranteed access to such resources.

There are a number of factors necessary to transform Africa national and regional Telecommunication/ICT networks into broadband integrated infrastructures that are highly interconnected and capable of providing the types of enhanced services needed in the network economy. These include:

- Digitalization of existing infrastructures;
- Expansion of the bandwidth capacity to reduce capacity lease costs and provide for high capacity services;
- Development of cross-boarder interconnectivity at the regional and continental level;

- Establishment of national and regional Internet exchange points that are interconnected at the regional and continental levels.

#### **b. Reinforcement of the African Internet Network**

A lot has been said about the need to keep local or regional traffic local as a way of not only improving the tariff levels and quality of services but also in trying to avoid paying huge fees for transit out Africa of local traffic (traffic originating and terminating within Africa). This can only be avoided if countries in the region are well interconnected at regional and continental level.

The same problem applies to both telephony as well as data communications by way of the Internet hence, there is a need to reinforce the African Internet Network; by ensuring that there is adequate Telecommunication/ICT networks interconnectivity and Internet Exchange within all the regions with high capacity and reliable links. Governments, RECs and the private sector should join hands in ensuring speedy realization of this objective.

#### **2.3.2.4 Capacity building**

##### **a. Training Institutions**

One of the critical elements in achieving sustainable development of Telecommunication/ICT is the availability of skilled human resource. Therefore, there is need for the development of human resource through the establishment of training institutions. Besides the presence of academic institutions of higher learning such as universities and technical training colleges, there are few specialized Telecommunication/ICT training institutions (such as AFRALTI, ESMT, NTI) whose objective is to produce skilled workforce. However, these specialized institutions need to be continuously equipped and updated with training resources and facilities to be able to cope with the ever changing technological and market conditions in the sector.

The regions should support the evolution and interconnection (networking) of specialized regional Telecommunications institutions by incorporating in their Telecommunication/ICT policies development of human resource strategy. Further, a strategy needs to be developed on how to facilitate the needed financial support for equipping the said institutions to commensurate international standards and to make them relevant intervention to maximize the use of these institutions on both national and regional level.

##### **b. Increasing the pool of available Telecommunication/ICT skills**

A study of the effects produced by the use of Telecommunication/ICT shows that the best results are obtained by combining the creation of an environment conducive to Telecommunication/ICT development and investment in Telecommunication/ICT skills. This implies the introduction or reinforcement of Telecommunication/ICT teaching at all levels of training and skills upgrading. It is equally vital that all citizens have the possibility of acquiring the capacity to use Telecommunication/ICT. This issue constitutes the greatest policy challenge that needs to be addressed.

Many developed countries have immigration-friendly policies that allow the easy movement of skilled Telecommunication/ICT professionals. The result for Africa has been an accelerated “brain drain”. Countries must evolve policies that develop their domestic workforce and encourage retention or repatriation of their highly skilled workers.

### **c. Training a broader base of Telecommunication/ICT professionals**

A characteristic of the worldwide Telecommunication/ICT skills base is that it is very young and mobile. As a result, the average middle-aged person might well find Telecommunication/ICT perplexing and this might be the cause of technophobia. Policies should therefore include an emphasis on more retraining for older workers and in particular to provide new learning opportunities for such workers in the information economy.

Africa is faced with a big challenge in the area of employment. Essentially, Telecommunication/ICT should be applied at work places in a way that boost efficiency, improve work quality and provide more skilled employment. Sustained effort should be deployed to intensify the participation of youth and women in active life. Telecommunication/ICT can help achieve this objective by, for example, facilitating part-time or home-based work.

### **d. Encouraging girls, women and the disabled to use and produce Telecommunication/ICT**

Girls lag in educational attainment in most countries and, even in wealthy ones, their enrolment in the core courses of the technologies is a small share of boys' enrolment. Further the male still generally dominate the arena of Telecommunication/ICT.

To address existing gender inequities in Telecommunication/ICT, policies across a number of fronts should include gender aspects and the need for increased emphasis on the education and training of girls and women, e.g. labor policies, education policies at all levels (primary, secondary, tertiary), universal service/access policies, e-Commerce policies encouraging women entrepreneurs, etc.

### **e. Encouraging the use of Telecommunication/ICT to increase access to lifelong learning**

Distance education learning, supported by the increased use of Telecommunication/ICT, is becoming a valuable substitute for classroom instruction. This could be particularly so in developing countries, where the one-teacher one-classroom model is becoming less viable, and where many are unable to complete formal education. Through public/private partnerships as well as investments of human and financial resources, it may be possible to increase the number of students that are reached. Education policies will thus have to ensure that an enabling environment is created that will allow for the establishment, and sustainability of, such partnerships.

**f. Increasing research and development capacity**

- **In Telecommunication/ICT related policy**

There is a need to focus on research and information gathering on current issues and the latest technologies. The main objective is to anticipate, monitor and evaluate Telecommunication/ICT policy and regulatory developments. Unfortunately, the research capacity available on the African continent is very scarce.

It is of concern that much of the research in Telecommunication/ICT has been driven by initiatives originated from outside of Africa frequently with little or no local capacity building of local researchers. Also, many policy processes in African countries are supported, if not driven, by experts from developed countries.

This seems to be a major gap that will have to be addressed by African training institutions so that more is done to further indigenous knowledge and accelerate the research process. Science and technology education, and the financing of this education at tertiary level, need to be integrated into all facets of policy and implementation.

- **At industrial level**

Telecommunication/ICT constitutes a key economic activity with high value added and encompass the computer technology, electronic communication and audio-visual markets. Most African States are still excluded from this market because they do not have the industry for the manufacture of Telecommunication/ICT product.

Telecommunication/ICT sector is vital and its development should be encouraged and supported. The spectacular growth achieved on the Asian and Latin American markets has had the effect of attracting telecommunication/ICT production, research and standardization activities to these regions.

There is the urgent need to make Africa attractive enough to usher in investments and create highly skilled jobs. In this regard, one of the key objectives of Telecommunication/ICT related industrial action should be to build an environment conducive to competition that should be as transparent and simple as possible. There is also the need to analyze the Telecommunication/ICT sector policies instituted by States so as to foster high level debate with Member States and enterprises with a view to devising a Telecommunication/ICT industrial policy for Africa.

Telecommunication/ICT research and development (R&D) plays a primordial role, and R&D initiatives are a vital element that determine the extent to which Telecommunication/ICT contribute to increased productivity. Future African Union policy should support research efforts.

**g. Increasing financing levels for Telecommunication/ICT related capacity building**

Telecommunication/ICT related capacity building needs in the public sector represent a high priority in all developing countries, and current financing levels have not been adequate to meet these needs. Governments themselves have little budget flexibility



to pay the added costs for training and high-skills personnel arising from new Telecommunication/ICT policies and initiatives.

Although donors, foundations, and the development banks support a wide variety of training and knowledge transfer programs as part of their Telecommunication/ICT related assistance, to date these have generally been insufficient to sustain the necessary levels of permanent capacity enhancement. Substantial increases in financial resources and efficient utilization of these resources, would be necessary, in most administrations, to establish capacity building programs commensurate with the goals and needs of effective e-governance and Telecommunication/ICT sector policies.

### **2.3.2.5 Mobilization and efficient use of finance**

The development of Telecommunication/ICT infrastructure is a highly capital intensive venture. Investment in Telecommunication/ICT tends to be both socially and commercially viable ventures in a conducive environment for private investment. At the same time the private sector does not need much advice in efficient use of finance while financial institutions continue to be willing to provide capital for Telecommunication/ICT projects largely because there is no known Telecommunication/ICT project that has failed the viability test even in Africa. Consequently the task of mobilizing and ensuring efficient use of finance in the Telecommunication/ICT sector reduces to one of policy and regulatory intervention with a view to providing the right investment climate as shown below on policies and favorable regulatory framework for the development of Telecommunication/ICT networks and services.

In the context of developing Telecommunication/ICT initiatives, securing funding from available resources have proved to be a challenge for many stakeholders and developing country governments, first, because Telecommunication/ICT is a relatively new area. Secondly, stakeholders are often confronted by “process” challenges ranging from a lack of easily accessible information about available resources and mechanisms to tap, to high transaction and information gathering costs.

The following considerations address the way existing sources of financing can be more successfully exploited.

#### **i. Developing universal access/service fund mechanisms**

##### **• Access fund mechanisms**

Many countries have begun to establish Universal Access Funding mechanisms as a core component of their Telecommunication/ICT development policies, to bring together financial resources in support of extending access beyond the profitable market frontier. Recently established Universal Access Funds and their equivalent, with proper political and organizational mandates, can play an important coordinating role for the channeling of both industry and outside funds toward a variety of complementary Telecommunication/ICT development projects, and can also be scaled up through innovative financing instruments.

Experience to date is mixed as this trend is very new in much of the developing world, and most countries are just beginning to address policy, regulatory,

governance, institutional, and capacity issues required for successful management of these Funds. There are also possibilities for scaling up these funds through innovative financial mechanisms and schemes. Periodic assessment and evaluation of these mechanisms, together with other Universal Access development programs, can help define their future role in the sector in many countries.

- **Innovative Financing Mechanisms: Digital Solidarity Funds (DSF)**

The DSF is an African initiative launched by the President of Senegal, H.E Abdoulaye Wade during the first phase of the World Summit on the Information Society (Geneva 2003) and Validated during the second phase (Tunis, 2005). It was officially inaugurated on 14<sup>th</sup> of March 2005 in Geneva in the presence of several Heads of States, Ministers, Mayors and other personalities from all over the world. The DSF has, since it's creation, obtained many political supports during international meetings and summits of international institutions such as UN, AU, EU and WISIS.

Its long term financing is based on a voluntary commitment on the part of public authorities and business that decide to implement the "1% digital solidarity principle", a 1% contribution on public ICT dealings paid by the vendor from his profit margin on the entire transaction.

The DSF finances community-based projects that require the use of Information Technology, that are in line with national policies, that address insolvent demand, and that aim at creating new activities, new jobs and, in the long term, new market.

- **Roll-out License Obligations.**

License roll-out obligations have been used in many countries in the African region since the liberalization of the sector with a view to promoting universal access. Under this framework, licensed operators are given specific network and service roll-out targets that attract penalties in case of failure to meet targets. Unfortunately application of penalties to some of the non-compliant operators particularly the incumbent fixed network operators has often been frustrated by political interference and/or regulatory capture. A well written license in addition to an enabling legislation will support the regulator in enforcing appropriate sanctions.

- ii. **Developing cooperation, multi-stakeholder partnerships and seed financing**

Regional cooperation, multi-stakeholder partnerships, and seed financing appear to be critical elements for addressing critical infrastructure gaps and can in turn help promote further development of national backbones and last mile solutions in countries where gaps exist. In countries with relatively low population density and low per capita incomes (e.g. some of Africa's under-served sub-regions and Small Island States), financing constraints have become severe with neither the private nor the public sector being in a position to act alone. In such situations, regional infrastructures can also help serve national infrastructure in less developed regions, rural and under-served areas. In some cases additional partners can be brought into the process as well.

Regional organizations and institutions can help facilitate cooperation and coordination. International financial institutions and donors can then play a vital role in seeding and facilitating the financing for such regional infrastructure projects. There is likely to be increased market interest once the coordinated policy framework is put in place.

### **iii. Improving coordination of Telecommunication/ICT initiatives and projects**

There are numerous encouraging examples of how strategic integration of Telecommunication/ICT elements in development agendas can enhance education, health care, governance, business and job development, women's opportunities, and crisis intervention. This trend of broad-based, local level experimentation should be encouraged, even though some initiatives will inevitably fail to meet the ultimate goals of being sustainable, scalable, and replicable.

Greater cross-sectoral and cross-institutional coordination of financing programs and Telecommunication/ICT development initiatives would improve effectiveness and make better use of resources. It is generally agreed that the onus for coordinating inputs rests primarily with national Governments (coordinating at the national, regional, and international levels), which should identify priorities and ensure multi-sectoral participation in Telecommunication/ICT programs through strategic planning. Donors and other financial institutions should, for their part, be prepared to work within these national frameworks on a complementary basis, while making renewed efforts to coordinate planning, implementation, and evaluation on an international and regional basis as well.

### **iv. Developing domestic finance**

Many of these new areas of attention in Telecommunication/ICT depend greatly upon the active and creative participation of local entrepreneurs and SMEs, civil society, community groups, and others who are most intimately aware of the needs and opportunities of developing countries. This implies that a renewed emphasis on domestic modes of finance must play a central role in filling many of the key gaps, particularly in such realms as content, applications, capacity building, and knowledge sharing, by stimulating and leveraging market demand together with public development initiatives.

Governments, bilateral donors, multilateral banks, as well as private sector contributors, can all help accelerate the growth of domestic financial mechanisms by providing more direct and creative support to local microfinance instruments, Telecommunication/ICT small business incubators, public credit instruments, franchises, reverse auction mechanisms, community networking initiatives, and other innovations. Such approaches require a combination of outside seed funding assistance, technical expertise and best practice advice, risk mitigation, and commitments to support local entrepreneurs and investors, particularly in the start-up stages of new projects.

The finance and development communities must recognize that failures are inevitable in these newly emerging markets, but that the lessons of these experiments, together with selected, well-documented successes, can yield long-term benefits and self-reinforcing growth throughout the developing world.

### 2.3.3 Priority areas

The table 2.6 hereunder summarizes the main challenges by priority areas that Africa must address for Telecommunication to fully contribute to the integration of the continent and also support actions aimed at the development of all active sectors.

**Table: 2.6: Priority areas**

Priorities Areas	Challenges
Establishing Enabling Environments	<ol style="list-style-type: none"> <li>1. Level playing field for business/Regional telecommunication/ICT market</li> <li>2. Enabling Telecommunication/ICT policy and regulatory frameworks</li> <li>3. Innovative universal access policy</li> <li>4. Integrative e-strategies</li> <li>5. Relevant and valuable Telecommunication/ICT applications, services and content</li> <li>6. Integration in the information society and exercise of citizenship rights</li> <li>7. Management of scarce resources: frequencies, numbers right-of-way</li> <li>8. Security and reliability</li> <li>9. Convergence licensing</li> </ol>
Technological Convergence and Inter Operability	<ol style="list-style-type: none"> <li>1. Convergence</li> <li>2. Standardization</li> <li>3. Interoperability</li> </ol>
Building Broadband Infrastructures and Reinforcement of the African Internet Network	<ol style="list-style-type: none"> <li>1. Broadband Infrastructures</li> <li>2. Reinforcement of the African Internet Network</li> <li>3. Technology neutrality and sustainability</li> </ol>
Capacity Building	<ol style="list-style-type: none"> <li>1. Training Institutions</li> <li>2. Increasing the pool of available Telecommunication/ICT skills</li> <li>3. Training a broader base of Telecommunication/ICT professionals</li> <li>4. Encourage the deployment and utilization of Telecommunication/ICT across all socio-economic sectors in Africa: especially: encouraging girls and women to use Telecommunication/ICT, encouraging the use of Telecommunication/ICT to increase access to lifelong learning</li> <li>5. Increasing research and development capacity</li> <li>6. Increasing financing levels for Telecommunication/ICT related capacity building</li> </ol>
Mobilization and Efficient use of Financial Resources	<ol style="list-style-type: none"> <li>1. Developing universal access/service fund mechanisms</li> <li>2. Developing cooperation, multi-stakeholder partnerships and seed financing</li> <li>3. Improving coordination of Telecommunication/ICT initiatives and projects</li> <li>4. Developing domestic finance and promoting foreign direct investment</li> </ol>
Industrialization and Research and Development	<ol style="list-style-type: none"> <li>1. Encourage developing software and hardware in Africa</li> <li>2. Encourage R&amp;D and industrialization of African ICT systems</li> </ol>

## 2.4. Conclusion

The status of the Telecommunication/ICT sector in Africa is characterized by a catalogue of weaknesses even with the highly significant gains in some regions and some segments of the Telecommunications/ICT markets. An analysis of the key challenges carried out in **chapter 2.3** above shows that, despite the efforts invested by States and their partners in the restructuring, development and modernization of networks and services, Telecommunications/ICT sector in most African countries and in the Continent at large remains a source of serious concern.

Indeed, the sector is characterized by the following key indicators and observations:

- Inadequate broadband network development and, thus, weak inter-State broadband connectivity;
- Inequality between States in terms of several parameters of the sector development (networks, services, Internet, etc);
- Huge gaps in Telecommunication/ICT access between the urban and rural areas;
- Extremely low Internet access compared to other continents;
- Absence of common sector policy at continental level and in some regions or RECs, thereby hampering the Africa's capacity to attract heavy investments in regional and Panafrican networks and services development;
- Disparity of trade policies and routing plans, thereby fostering the transit of Africa's local traffic outside the continent.

In relation to the rest of the world, Africa lags behind in several aspects of Telecommunication/ICT development. As a matter of fact, its tele-density, internal and external connectivity, broadband technology development, access to Telecommunication/ICT, etc, are among the lowest in the world. In light of the above observations it can be said that there are at least three (3) levels of digital divide in the area of infrastructures development, access and capacity building:

- Digital divide between the African Continent and the rest of the world ;
- Digital divide between African regions and between African countries in the same region; and
- Digital divide between urban and rural or isolated areas within the countries.

**His Excellency Julius NYERERE** once stated: “when the super powers were attempting to get to the moon, we were trying to reach the village. When the super powers got to the moon, came back and communicated with the stars, we were still trying to reach the village, and the village seemed increasingly inaccessible.” This deep thought of this illustrious Statesman is still true in our continent in this new Millennium in terms of Africa's capacity to catch up with the rest of the world in area of Telecommunication/ICT.

One of the scarce satisfactions to be noted in the tables of Telecommunication/ICT statistics of Africa, is the mobile boom which, although not fully satisfactory all the need in terms of Telecommunication/ICT applications, especially with regard to appropriate broadband for the Internet, contributes to the popularization of some services, notably telephony.

Going by the analysis of the Telecommunication/ICT sector in Africa, it can be concluded that the digital divide is challenging and calls for appropriate interventions. In this connection, the following message by **His Excellency Kofi ANNAN, former Secretary General of the United Nations on 17 May 2005**, on the occasion of the 140<sup>th</sup> World Telecommunication Day underlines the full dimension of the problem: “we live in an age in which communication between people is essential to achieving our shared goals of development and peaceful coexistence...it is up to us to use and harness the potential of these technologies in our work to extend the benefits of education, health care, trade and environment protection to all,”.

### **III. Efforts Deployed from all side to Address the Challenges**

#### **3.1 Individual and Collective Dynamic to Develop the Sector**

To address the challenges of telecommunications /ICT sector development, Africa's major stakeholders, especially countries, with the support of regional and international organizations and institutions, embarked on implementation of policies and projects aimed primarily at building the sector's capacities and infrastructures. In this regard, the following collective and individual efforts are worth mentioning:

##### **3.1.1. At countries level**

Activities were carried out and others are underway aimed at boosting the sector. They focus, inter alia, on the following:

- Under the responsibility of Governments
  - √ The establishment of regulatory organs;
  - √ The formulation by governments of National Information and Communication Infrastructure Plans (NICI-Plan) and e-strategies aimed at applying the ICT potential for the achievement of development goals;
  - √ The development and implementation of ICT application projects with national development priorities, for instance in the areas of education, health, trade and governance;
  - √ The gradual opening up of ICT markets to competition.

These activities are frequently undertaken in many countries with extremely high-level of political commitment.

- By Governments and particularly Operators and Services Providers
  - √ Development of national and international networks and implementing new technologies
  - √ Development of services

##### **3.1.2. At Regional and continental level**

At regional level, the Regional Economic Communities (RECs) and Inter-Governmental Organizations (IGOs) are deploying efforts towards:

- Harmonization of Telecommunication/ICT sector policies and creation of Regional Regulatory Associations, namely, ARTAC for CEMAC; CRASA (ex-TRASA) for SADC; WATRA for ECOWAS; ARICEA for COMESA; AREGNET for the Arab Region; EARAPTO for EAC.
- Formulation of integrated Telecommunication/ICT regional programs and projects (e-CEMAC, ECOWAS broadband projects, SRII, COMTEL and EASSY for SADC and COMESA countries, CAB and FESTOON for Central Africa Countries, etc).

At continental level the following initiatives and projects can be noted:

- Creation of African telecommunications Regulator's Network (ATRN);
- Establishment of the African Association of Internet Service Providers (AfriSPA) and AfriNIC for the management of Domain Names;
- The Foundation for Open Source Software in Africa (FOSSA);
- Creation of the Regional African Satellite Communication Organization (RASCOM), with a view to implement a Pan African Satellite system.

### **3.1.3. Contributions of the African Telecommunications Union**

Through its mission to promote the rapid development of Info-Communications in Africa to ensure universal access and services as well as full connectivity between countries, the African Telecommunications Union, pursuant to its Strategic Plan, seeks to develop the Telecommunication/ICT sector in Africa. One of its objectives is to promote cooperation programs to attract capital for reinforcement of information infrastructure with a view to improving cross border-connectivity. Service development projects such as e-Post and AfriSIM are examples of the initiatives and activities of ATU's input to the development of pan-African Telecommunication/ICT services and networks.

### **3.1.4. The Traditional Catalytic Role of the International Telecommunication Union**

Through the decisions of its major policy bodies such as the Conference of Plenipotentiaries (PP) and the World Conference on Telecommunications Development(WDTC), the International Telecommunication Union has, for long, played a significant role in the development of the Telecommunication/ICT sectors in Africa. Among its numerous initiatives, which are important, or of direct interest to Africa, the following may be mentioned:

- A report of a study on infrastructure development, entitled "Partnership Framework for Telecommunication/ICT Infrastructure Development in Africa" carried out by ITU, was adopted by African Ministers responsible for Telecommunication/ICT during a Symposium held in Abuja, Nigeria from 3 to 4 July 2005 ;
- African Regional Initiatives adopted by the World Conference on Telecommunication Development held in Doha in March 2006. These initiatives concern five (5) major areas of the Telecommunication /ICT sector and will be implemented by the Telecommunications Development Bureau (BDT);
- Organization of the Summit "Connect Africa", Kigali, October 2007 that adopted five main objectives concerning the development of infrastructure of telecommunications and TIC.
- As regards regulations, one can mention the organization of regulators consultation framework – Global Symposium for Regulators (GSR), Forum on Telecommunications Regulation in Africa (FTRA) and preparation of the "Telecommunication/ICT Regulation Toolkit".



### **3.1.5. Contributions of the United Nations Economic Commission for Africa**

The Economic Commission for Africa (ECA), supported by the Canada Fund for Africa and its ePolicy Resource Network (CePRC) as well as the Government of Finland, has been providing, through the African Information Society Initiative (AISI) framework, upstream policy advice to assist countries and Regional Economic Communities (RECs) in the design of strategic approaches to ICT as an enabler for development with links to Poverty Reduction Strategies (PRS) and related development goals including the Millennium Development Goals (MDGs). To this end, ECA has been assisting African countries in developing national and sectoral ICT strategies for accelerating their socio-economic development, through the National Information and Communication Infrastructure Plan (NICI-Plan). Support is also being provided to countries and RECs to facilitate the harmonization of national strategies and regulatory frameworks at the regional levels. These efforts were accompanied by a series of workshops on Access and Regulation in Central, West, East and Southern Africa aimed at building the capacity of policymakers, regulators, legislators, private sector, civil society, academia and other relevant stakeholders in the continent in the elaboration of harmonized strategies and guidelines on legal and regulatory frameworks that focus on democratizing access to ICTs. In this respect, the following key activities are being undertaken in West and Central African Regions. ECA also played a key role in the formulation of African Regional Action Plan for the Knowledge Economy (ARAPKE) arising from the process of the World Summit on the Information Society.

### **3.1.6. Contribution of the World Bank**

As part of the World Bank's very vast and diversified contribution to the development of the sector, it can be mentioned that its participation in the programme "Connect the World" and in the Information for Development (InfoDev) Programme have been its contributions in this sector. The main objectives of these programmes are to assist developing countries to take full advantage of the possibilities offered by modern information systems. Specifically, the programme aims at:

- Sharing of experience and dissemination of pertinent outcomes to governments and public or private decision makers on the economic development potential of information and communication systems ;
- Management of policies for advisory and technical assistance for governments engaged in privatization policies, introduction of competition, increased competitiveness, improvement of the regulatory environment and encouragement of investments in the information and telecommunications sector; and
- Conduct of feasibility and investment studies

The World Bank's InfoDev Programmes is intended to support private operators' development, Internet access and/or service providers and get countries to introduce competition in the telecommunications sector especially through privatization, creation of regulatory structures, etc. The programme also envisages the mobilization of substantial financial resources in support of Internet development.

### **3.1.7. Other contributions**

The contribution of other international organizations such as UNDP, Universal Postal Union and UNESCO in Telecommunication/ICT development in Africa has been remarkable especially during the WSIS process.

### **3.1.8. Recent Initiatives and commitments of Africa as well as major conclusions of International conferences committing Africa**

To illustrate the issues involved herein it is intended to raise in this section some very recent activities involving African States' executives responsible for Telecommunication/ICT, activities that gave rise to commitments and action plans to which these high level executives acceded to. In some cases, such commitments or action plans were adopted by the African Union.

#### **i. Symposium of Ministers Responsible for Telecommunication/ICT: Abuja, July 2005**

The Ministerial Symposium on Telecommunication/ICT in Africa held in Abuja, Nigeria, from 3 to 4 July 2005, considered the report on ITU preliminary assistance to NEPAD.

The Symposium considered, among other things, the impact of the digital divide in most African countries especially in the rural areas, the very high cost of basic infrastructure resulting from import taxes, and the technology convergence, which necessitates all inclusive regulatory approach;

The Symposium also noted with interest, the relevance of the report of the ITU Study which, among other thing, highlighted continental Telecommunication/ICT infrastructure, policy and regulatory environment, capacity building, partnership and cooperation at continental level, and took decisions on several aspects of Telecommunication/ICT development in Africa.

#### **ii. The Conclusions of the World Summit on the Information Society and African Regional Action Plan on the Knowledge Economy (ARAPKE)**

The first phase of the World Summit on Information Society (WSIS), held in Geneva in November 2003, adopted a Declaration of Principles and a Plan of Action. The Declaration, among other things, stated as a fundamental principle, that information and communication infrastructure constitutes the essential basis for inclusive information society. The adopted Plan of Action includes an indicative reference targets to be attained by 2015 in relation to Telecommunication/ICT connectivity and access. Of the ten (10) key targets, eight relate to the provision of information and communication infrastructure.

The second phase of the Summit held in Tunis in November 2005 adopted an Agenda and Commitments reiterating the support of participants to the Declaration of Principles and Plan of Action adopted in Geneva. The Agenda adopted in Tunis concerns Internet governance and related matters, funding mechanisms aimed at

reducing the digital divide as well as monitoring implementation of the Geneva and Tunis decisions. The outcomes of these two phases concern Africa.

During the WSIS process, the “Accra Commitments” were adopted by African stakeholders at the African regional preparatory conference to the second phase of WSIS. The operational aspects of the Accra commitments comprise:

- Formulation of e-Strategies;
- Definition of indicators to evaluate the implementation of the Information Society;
- Creation of an environment conducive to partnership;
- Adaptation of Internet governance to the needs of the information society;
- Resource mobilization;
- International cooperation

On the basis of the above commitments and relying on the statement that “ Africa is invited to get further integrated into the global economy which is a knowledge-based economy”, an African Regional Action Plan for the Knowledge Economy (ARAPKE) was drawn up.

Pertinent measures, partners involved and achievement indicators were adopted. The ARAPKE was adopted by the Assembly of the African Union held in Khartoum in January 2006 (African Union Executive Council Decision EX.CL/Dec.258 (VIII)).

### **iii. Major Conclusions of the Forum on Telecommunications Regulation in Africa (FTRA)**

The Forum on Telecommunications Regulation in Africa (FTRA) is an annual event organized by the International Telecommunications Union, bringing together practically all African institutions and executives responsible for Telecommunications Policy and Regulations. The major conclusions of the recent meetings (Accra 2003, Kampala 2004, Maputo 2005 and Yaoundé 2006, Nairobi 2007) relate to several regulation and policy issues.

#### **3.1.9. Donors’ Initiatives and major Cooperation Agreements for Infrastructure Development in Africa**

The major on-going initiatives are as follows:

- **Infrastructure Consortium for Africa (ICA)**

The Infrastructure Consortium for Africa (ICA) comes from the British Prime Minister Tony Blair’s Plan. The objective of the Consortium is to build strategic partnership among donors and stakeholders to facilitate infrastructure development in Africa in line with the priorities defined by AU/NEPAD and Governments, with a view to fostering economic growth and reducing poverty. The focus will be on cross-border projects at continental and regional levels as well as on projects to be implemented at the national level. The sectors covered are, namely, transport with all its components, water and sanitation, energy and Telecommunication/ICT.

- **Europe-Africa Infrastructure Partnership**

The European Union-Africa Infrastructure Partnership, initiated by the European Union was signed on 24 October 2007. It is a shared response proposed to the major infrastructure challenges in Africa, in terms of a contribution to development, and to the establishment of physical links not only to strengthen connectivity between States and regions, but also between Africa and other continents, to facilitate intra-African trade and generally, towards the attainment of the Millennium Development Goals.

The area of action of this partnership will take into account the integrated infrastructure (corridors) required for the interconnection of Africa as well as the missing links and a Master Plan for each sub-sector. Investments should cover the wider trans-border and regional projects: transport networks (roads, railways, river transport, ports and airports), energy and water infrastructure, and telecommunications networks.

- **Other Partnerships**

Other partnerships concluded or under negotiation are: African Union-Japan Partnership (TICAD), African Union-United Nations Partnership, African Union-South American States Partnership, African Union-China Partnership, African Union-Spain Memorandum of Cooperation, African Union-India Partnership, etc. The objective of these initiatives is to endow Africa with energy, water, transport and communication infrastructure, the true pillars of Africa's development.

### **3.2. Contribution of the African Union**

#### **3.2.1. Vision, Mission and Strategic Objectives of the African Union**

The establishment of the African Union was accompanied by the elaboration by the African Union Commission of a Strategic Plan 2004 – 2007 to guide its actions towards the ultimate **goal pursued by the African Union, which is the regional integration. The** vision of the African Union is to « Build an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena ».

The vision of a united and integrated Africa will inevitably take time to realize. It is therefore imperative to lay the foundations for future integration by eliminating the obstacles to the implementation of integration projects. That is why one of the priority strategic objectives pursued by the African Union is to « **Develop integration infrastructure** ».

The following specific objectives were retained under the strategic objective “Develop Integration Infrastructure” in its strategic Plan 2004-2007.

- Establish integrated transport, energy and telecommunications infrastructure systems that are reliable, efficient and affordable;
- Carry out all the necessary actions for the harmonization of policies, strategies and sectoral legal and regulatory frameworks (transport and tourism, energy, telecommunications and postal services).

For the particular case of the Telecommunications sector, the African Union aims to contribute to bridging the digital divide, by working for the development and interconnection of Telecommunications and ICT Infrastructure, building capacities and international cooperation, as well as promoting the use of ICTs.

Then, **the Mission** in the Telecommunication/ICT sector is “develop harmonized policies and regulatory frameworks that will enhance accessibility, availability and affordability to Telecommunication/ICT services and achieve global competitiveness of the African Telecommunication/ICT industry”.

### **3.2.2. On going activities**

The following actions are the major on going contributions of the African Union to the development of Telecommunications and ICT sector.

- **Short-Term Action Plan (STAP) and NEPAD)**

The AU/NEPAD programme is Africa Union’s response to infrastructure development. The Short-Term Action Plan of the AU/NEPAD programme focuses mainly on priority physical investments. Consequently, regional telecommunications projects are being implemented or planned. These include broadband Telecommunications/ICT infrastructure projects for Southern and Eastern Africa, North Africa, West and Central Africa as well as the e-School project. The Southern and Eastern Africa broadband infrastructure programme comprises the EASSY and COMTEL components. These projects are the subject of a Protocol on high level policy and regulatory framework already signed by some countries stakeholders.

- **Medium to Long Term Strategies Framework Study (MLTSF**

The MLTSF objectives are to develop Africa’s infrastructure development strategy including medium term programmes with accompanying measures, prepare and address cross cutting themes, set up an Africa infrastructure data base and plan for its upkeep.

- **Elaboration of Master Plan;**

- **Implementation of concrete projects:** Creation of Pan African e-Network, Unified Numbering Project, Creation of Pan African TV and Radio Channel.

**PART: B.**

**REFERENCE FRAMEWOK FOR THE HARMONISATION OF  
TELECOMMUNICATION/ICT POLICIES AND REGULATIONS  
IN AFRICA**

## **I. The Need to Establish an Enabling Policy Environment**

### **1.1. Infrastructure, critical foundation for development and the physical integration of the continent**

Infrastructure development is one of the critical conditions for the acceleration of regional integration and economic growth, for the reduction of poverty and for the realization of the Millennium Development Goals (MDGs). Consequently, conscious of the potential of infrastructure to stimulate economic development, namely trade flow as well as social and cultural interactions, Africa has resolved, as a priority, to provide the continent with reliable, efficient and affordable integrated infrastructure systems for transport, communications and energy.

Telecommunications and Information and Communication Technologies are considered as a pillar of integration and offering economic development opportunities for the creation and exchange of knowledge. To that end, they are important elements of the integrated infrastructure systems to be built. Several development stakeholders of the continent have retained the Telecommunications /ICT sector as one of their priority areas. Thus:

- African countries, aware of the potentials of Telecommunication/ICT aim at developing relevant mechanisms to ensure the inclusive development and speedy usage of Telecommunication/ICT and their integration in all activities and development plans;
- Regional and international organizations as well as diverse partners of Africa include the Telecommunication/ICT aspect in their action plans.

### **1.2. Recommendations of fora and international meetings**

The development of regional infrastructures and their rational operation can only be developed in an appropriate enabling regional environment, namely, a regulatory framework that allows all stakeholders to have a common understanding of the objectives and expected results, and defining rules that are critical factors to attract investment. This conditionality has been recognized on several occasions during foras and other regional in international telecommunication /ICT tribunes. In addition, studies carried out by ITU on the Partnership Framework for the Development of Telecommunication/ICT Infrastructure in Africa and the action plan developed by ECA - AU African Regional Action Plan for the Knowledge Economy (ARAPKE) drafted in collaboration and strong support of ECA during the World Summit process, underscore the need to establish harmonized policies and regulatory frameworks.

### **1.3 Multi-stakeholders and multifarious initiatives context**

We have no intention to imply that nothing is being done to establish an environment conducive to the development of Telecommunication/ICT in Africa. The main issue is to determine whether anything that should be done is done in conformity with the objectives to be attained and or whether the expected goal of efficient integration of the continent is taken into consideration.

The Regional Economic Communities (REC) and the Intergovernmental Organizations (IGO) have thus, adopted or are in the process of implementing harmonized policies and regulatory frameworks. In addition, to strengthen this momentum, among other things, ensure the convergence of regulatory practices in the sector, regulatory associations have been established at the level of the REC and the IGO. Despite this increased awareness and actions undertaken by some regional bodies as stated above, there are still challenges to be addressed. These challenges include the following;

- The current situation is still characterized by a fragmentation of activities for the development of Telecommunication/ICT without taking enough into account the continental framework as stated in the Constitutive Act of the African Union and the Abuja Treaty establishing the African Economic Community ;
- To strengthen the integration of the African regions, there is need to harmonize policies, regulations and standards, and to promote the establishment of a common continental market by fostering the implementation of integrated infrastructure programmes. The objective is to establish and improve as a priority, networks and services with a view to strengthening intra-Africa trade and the socio-economic integration of the continent, while maintaining a relational balance with other continents in the context of globalization.
- The RECs are at different levels with regard to contents, implementation, and application of common policies and harmonized regulatory frameworks.
- Ongoing or planned regional projects involve countries or regions with different policy and regulatory frameworks. Thus, difficulties can be encountered during the implementation or the operation of infrastructures and delay the expected regional connectivity, or just jeopardize the sustainability of the project by diverting the expected regional traffic.
- Conversely, other projects do not pay due consideration to regional integration or multi-stakeholders dimensions and fail to involve operators and/or states to optimize the utilization of scarce resources of the continent.
- The new initiatives (ICA, Europe-Africa Partnership on Infrastructure, Connect Africa Summit, Kigali, October 2007) involve several regions and/or demand interregional consultations before implementation.

#### **1.4 Challenges to be addressed**

Section 2.3, in Part A of this document, summarizes the main challenges by priority area, that Africa must address for telecommunications to fully contribute to the integration of the continent, and also support actions aimed at the development of all active sectors. The consideration of the challenges faced in the Telecommunication/ICT sector in Africa has highlighted the need for a concerted vision of the major stakeholders with respect to:

- Harmonization of national regulations with a view to creating a Telecommunication/ICT regional market;



- Building the Information Society;
- Definition of common guidelines for the major stakeholders with a view to taking maximum advantage of the Information Society
- Seeking the coherence and economic efficacy of measures, focusing attention on priority initiatives and adopting effective and efficient implementation strategies;
- Establishing effective coordination among the RECs, and between the RECs and continental stakeholders for the supervision of the implementation of community actions and projects at the regional or continental levels.

## **1.5. Conclusion**

It is in view of the aforesaid considerations and according to Article 3 of the Constitutive Act, that the African Union Commission, in line with its role and in relation to the ultimate objective of rapid integration and sustainable development of the Continent, initiated the present study on harmonization of policies, regulatory framework and strategies conducive to harmonious and expeditious development of regional and continental Telecommunication/ICT networks and services. The objective of the methodological approach adopted, as summarized in **Annex 1**, is to ensure wide participation of all major stakeholders (States, RECs, African and International Specialized Organizations operating in Africa), resource persons and consultants, as well as representatives of regulators, the civil society and operators.

## **II. Guiding Principles**

The referential policy and regulatory framework will comply with the following principles:

- Solidarity between African Member States and peoples;
- Cooperation between the AUC, RECs; and other African organizations;
- Partnerships between and amongst African peoples;
- Link to Poverty Reduction Strategy Programmes (PRSP), Millennium Development Goals (MDGs) and other continental development goals, such as African Regional Action Plan on the Knowledge Economy (ARAPKE);.
- Principles of the World Summit on Information Society (WSIS);
- Finance viability, technical feasibility and political acceptability;
- Goals of Connect Africa Summit (Kigali, October 2007).

### **2.1. Solidarity**

The solidarity principle rises from the Constitutive Act of the African Union and aim at realizing a greater unity and solidarity between the African countries and peoples ". This solidarity implies, in addition to African cardinal values, resource sharing heritage of our history which will allow Africans to enter together in modernity.

### **2.2. Cooperation**

Cooperation between the African Union Commission and the other continental organizations namely the Regional Economic Communities (RECs) involved in the

development and the integration of the continent is an important element of the Constitutive Act.

At regional level, the principle of cooperation, as contained in the community objectives enshrined in the Treaty, will allow for expansion and sharing RECs initiatives.

### **2.3. Partnership between stakeholders of African Telecommunication/ICT sector**

A reference policy and regulatory framework must take into account interests of all stakeholders and the key actors of African Telecommunication/ICT Sector, namely, Governments, regulators, development partners, operators, service providers, the private sector, and most importantly, the consumers.

### **2.4 Link to PRSP, MDGs, SMSI and other continental development goals and objectives (ARAPKE, Connect Africa Summit)**

The reference framework for the harmonization of policies of Telecommunications and ICT is developed in a context marked by the adoption of commitments in favor of the development subscribed on a world level and regional, such as OMD, PARAES, SMSI objectives and goals of the Connect Africa Summit. Then, the content of the reference framework for the harmonization of policies should facilitate the achievement of the objectives and goals of these various commitments.

### **2.5. Financial viability, technical feasibility and political acceptability**

The reference policy and regulatory practices framework must be for Member States and Regional Economic Communities and politically acceptable in order to guarantee its successful implementation. In terms of financial implication and technical feasibility it should not be a source of supplementary problems. On the contrary it must be a value added contribution to efforts that are already being undertaken at the national, regional and international levels in terms of measures taken to support the development of the Telecommunication/ICT infrastructures.

### **III. Reference Framework for the Harmonization of Telecommunication/ICT Policies and Regulation in Africa**

To elaborate on the challenges of the sector of Telecommunications and ICT according to the vision and mission of the African Union recall in Section 3.2.1 of Part A, it is proposed a reference framework for the harmonization of Telecommunication and ICT policy and regulation, taking into account the Guiding principles described hereinabove. The details of this reference framework are set out below.

#### **3.1. Broad Objectives of the Harmonized Policy**

The following broad objectives have been identified and are considered the main challenges facing Africa. These broad objectives are enumerated here under;

- i. Establish **harmonized policy, legal and regulatory frameworks** at the regional and continental levels to create an enabling environment that will attract investment and foster the sustainable development of competitive African Telecommunication/ICT regional markets, infrastructures, and to increase access;
- ii. Develop **integrated infrastructures and access networks** as the cornerstone of the e-access, with efficient cross-border interconnectivity to provide increased access to Telecommunication/ICT services for the greatest number of populations in Africa, including the improvement of connectivity of the African continent with the other continents.
- iii. Support the development of industrialization and research on sciences and technology related to Telecommunication/ICT.
- iv. Develop African **human resource and increase awareness** to ensure active participation of Africa in the global information and knowledge-based economy;
- v. Develop relevant and valuable **applications** to encourage the deployment and utilization of Telecommunication/ICT across all socio-economic sectors in Africa in order to improve efficiency and productivity;
- vi. Promote and develop African **content** to increase global presence of African values, cultures, languages and indigenous knowledge;
- vii. Mobilize financial resources by strengthening **regional cooperation** and **multi stakeholder partnerships** and promotion of **public and private partnerships**.

#### **3.2. Strategy to Achieve Objectives:**

##### **A. Establishment of harmonized policy and regulatory framework**

1. Engage the highest level authorities to enhance the political will to foster the development and harmonization of the Telecommunication/ICT sector.

2. Develop harmonized regional and continental e-strategies.
3. Develop regulatory guidelines at regional and continental levels.
4. Establish mechanisms to encourage and strengthen stakeholder participation in the harmonization process

#### **B. Development of Integrated Infrastructures and Access Networks**

1. Promote regional and intra-continental connectivity.
2. Promote open access to infrastructure
3. Promote infrastructure sharing.
4. Promote digital broadcast infrastructures/networks.
5. Promote infrastructure/networks convergence, in particular migration to IP/NGN networks;
6. Promote appropriate and innovative technologies that can improve universal access/service and affordability.
7. Implement technologies/networks that complies to internationally accepted and widely spread standards, taking into account regional interconnectivity and interoperability.
8. Promote African participation in the development of standards at the regional and international levels.

#### **C. Support to Industrialization, Research and Development**

1. Encourage developed software and hardware in Africa;.
2. Encourage research & development and industrialization of African to develop Telecommunication/ICT systems.
3. Establish regional common research centres.

#### **D. Development of Human Resources and Increase of Awareness**

1. Promote attitudinal change and confidence for the adoption of Telecommunication/ICT in the economy as a mode of life.
2. Increase Telecommunication/ICT awareness among political leaders and policy makers at the highest level.
3. Increase the pool of African professionals in all areas of Telecommunication/ICT competencies; encourage their mobility and their retention within Africa.
4. Develop mass e-literacy and promote wide usage of Telecommunication/ICT.
5. Establish and develop centres of excellence and Telecommunication/ICT research institutions, and promote effective cooperation among them,
6. Establish and develop institutions for capacity building for Telecommunication/ICT at various levels, particularly for regulators and policy makers.

#### **E. Development of Telecommunication/ICT applications**

1. Encourage the deployment and utilization of Telecommunication/ICT across all socio-economic sectors in Africa; especially in the following priority areas, namely, e-Government, e-Education, e-Commerce, e-Health, e-Culture.
2. Build confidence in the development and use of Telecommunication/ICT applications, taking into consideration better management of the cyberspace, from the producer as well as from the consumer point of view.

3. Promote the development and use of open source software, and build applications on such platforms.

#### **F. Development of African Content**

1. Preserve the African heritage in digital format, and its relevant Intellectual property rights.
2. Encourage the creation of African content in diverse languages.
3. Promote global presence of the African heritage, cultures, and indigenous knowledge;

#### **G. Mobilization of Financial Resources**

1. Raise political awareness to consider Telecommunication/ICT as a priority sector in social economic development.
2. Allocate public resources for Telecommunication/ICT development.
3. Promote public private partnerships and other multi-stakeholders partnerships.
4. Create incentives for foreign investments and coordinate its usage,
5. Promote the development of domestic finance by providing support to local entrepreneurs and investors.
6. Develop innovative approaches for the creation and management of universal access/service funds.
7. Increase awareness, mobilization, coordination and efficiency on regional, continental and international initiatives and projects of Telecommunication/ICT development

### **3.3. Programme of Action**

#### **A. Establishment of Harmonized Policy and Regulatory Framework**

##### **1. Engage Political Authorities**

- i. Establish Telecommunication/ICT commission/body at the very highest level of political leadership at national and continental level.
- ii. Assign a focal-point - endowed with adequate authority and resources - to enhance regional and intra-continental cooperation.

##### **2. Telecommunication/ICT Policies**

- i. Develop and implement e-strategies with the participation of all stakeholders
- ii. Develop and implement cyberspace policy and legislation.

##### **3. Develop Regulatory Guidelines at Regional and Continental Level.**

- i. Develop and Adopt regional guidelines on Telecommunication/ICT regulation, namely: interconnection, spectrum, licensing, tariffs, universal/access service, dispute resolution, standards and Type approval, consumers and environmental.
- ii. Develop and adopt guidelines on cyber security, domain name management, electronic signature....etc.
- iii. Promote the adoption of fair and sustainable competition policies and guidelines at country/regional and continental level
- iv. Promote regional/continental licensing mechanisms to establish regional/continental operated networks and service providers.

##### **4. Establish mechanisms to encourage and strengthen stakeholder participation in the harmonization process**

- i. Establish regular fora for Telecommunication/ICT stakeholders at national, regional and continental levels on specific issues of interest.
- ii. Strengthen the coordination of spectrum management, frequency planning, numbering and other scarce resources.
- iii. Strengthen regional coordination for the development of common African positions in international fora;
- iv. Strengthen collaboration with African Institutions (ATU, Afrinic, ) and regulators responsible for Telecommunication/ICT and broadcasting policies.

#### **B. Deployment of Integrated Infrastructure and Access Networks**

## **1. Promote regional and intra-continental interconnectivity.**

- i. Develop and implement, regional and continental infrastructure master plans taking into account convergence of technologies;
- ii. Establish and support broadband infrastructure projects that promote regional integration.
- iii. Establish and enhance regional and continental Internet exchange points( IXPs) and their interconnection;
- iv. Modernize existing infrastructure, and Integrate and complement new infrastructure projects with existing infrastructures
- v. Establish or strengthen regional indicators on infrastructure and access to monitor Telecommunication/ICT progress,

## **2. Promote open access to infrastructure**

- i. Establish Model High Level Policy and Regulatory Framework for regional/continental Telecommunication/ICT Broadband Infrastructure network based on open access non-discriminatory Principles;
- ii. Promote and foster the portability at national/regional/continental level

## **3. Promote infrastructure sharing.**

- i. Ensure close collaboration and coordination with basic utilities infrastructure networks such as electricity, water pipe lines and transport networks in the rollout of Telecommunication/ICT infrastructures including broadcasting;
- ii. Encourage infrastructure and site sharing among Telecommunication/ICT Operators.

## **4. Promote digital-broadcasting infrastructures/networks.**

- i. Modernize the existing broadcasting infrastructures/networks, through acceleration of migration from analogue to digital broadcasting systems.
- ii. Digitize broadcasting and media production facilities.

## **5. Promote infrastructure/networks convergence, in particular migration to IP/NGN networks.**

- i. Promote implementation of converged infrastructures based on IP/NGN technologies.

## **6. Promote appropriate and innovative technologies that can improve universal access/service and affordability.**

- i. Adopt technologically neutral approaches as an incentive to support universal access/service and its affordability.

## **7. Promote technologies/networks that comply to internationally accepted and widely spread standards, taking into account regional interconnectivity and interoperability.**

- i. Establish African Technology Watch Forum to track the development of technologies to provide advice on policies that can enhance

Telecommunication/ICT connectivity in Africa, and monitor conformance to standards to ensure universality and interoperability of networks.

**8. Promote African participation in the development of standards at the regional and international levels.**

- i. Encourage the effective coordination and participation of African experts in International Standardization Bodies, particularly memberships in working groups
- ii. Establish regional and continental working groups on standardization.

**C. Encourage Industrialization, Research & Development (R&D)**

**1. Promote local development of software and hardware.**

- i. Create incentives for local software development and assembly of Telecommunication/ICT equipment

**2. Promote research & development and technology transfer.**

- i. Create repair and maintenance centers for Telecommunication and ICT

**D. Development of Human Resources and increase of awareness**

**1. Promote attitudinal change and confidence for the adoption of Telecommunication/ICT in the economy as a mode of life:**

- i. Implement public campaigns to promote cultural change for the adoption of Telecommunication/ICT in the economy as a mode of life;
- ii. Increase commitment to the development of an enabling policy environment, legal and regulatory frameworks for the knowledge-based economy;
- iii. Increase commitment for the financing levels of Telecommunication/ICT capacity-building programs, materials, tools, educational funding, and specialized training initiatives, especially for regulators and other public sector employees and organizations;

**2. Increase Telecommunication/ICT awareness among political leadership and policy makers at the highest level:**

- i. Implement high level awareness and/or training programs for political leaders at the highest level to enable them provide effective leadership in Telecommunication/ICT development;
- ii. Implement high level training program for Telecommunication/ICT policymakers and regulators;



**3. Increase the pool of African Telecommunication/ICT professionals in all areas and competencies, encourage their mobility and their retention within Africa:**

- i. Develop an African human resource development policy for the telecommunication/ICT sector;
- ii. Identify training needs and activate coordination between the Ministries concerned with capacity building to harmonize educational needs on Telecommunication/ICT;

**4. Develop mass e-literacy and promote wide Telecommunication/ICT usage:**

- i. Create regional database of training and Telecommunication/ICT educational and research institutions, as well as experts; and disseminate and promote this information for better utilization of available resources.
- ii. Develop Telecommunication/ICT skills for civil servants through intensive end user training schemes;
- iii. Introduce Telecommunication/ICT curricula in schools and universities with special attention to the education of youth, girls and women;
- iv. Promote Telecommunication/ICT initiatives with gender perspective; and promote Telecommunication/ICT usage for disadvantaged groups, especially among the girl child and women.
- v. Encourage the usage of Telecommunication/ICT by establishing community access centers through public existing facilities such as post offices, schools, libraries, etc. and to increase access to education and learning.
- vi. Develop databases at the national, regional and continental levels to monitor the implementation of Telecommunication/ICT policies, legislation and regulation

**5. Establish and develop Telecommunication/ICT centres of excellence, research institutions, and promote effective cooperation among them,**

- i. Strengthen existing centers of excellence and other high level telecommunication/ICT -related training institutions to provide for the deficit of professionals, and to produce professionals in the development, application and diffusion of Telecommunication/ICT systems;

**6. Establish and develop Telecommunication/ICT institutions for capacity building at various levels, particularly for regulators and policy makers.**

- i. Review efficiency of available facilities and create training networks to increase the training capacities;

- ii. Support key research institutions, universities and other educational institutions through cheaper and faster internet access and partnerships with more advanced counterparts;
- iii. Increase research capacity in Telecommunication/ICT policies, legislation and regulation, including research on Internet governance policies;
- iv. Establish research institution at the national, regional and continental levels to provide expertise in the development of Telecommunication/ICT policies, legislation and regulation;
- v. Identify and establish a network of African capacity building institutions that offer Telecommunication/ICT - related curricula to maximize the utilization of available resources.

## **E. Development of Telecommunication/ICT Applications**

### **1. Encourage the deployment and utilization of Telecommunications/ICT across all socio-economic sectors in Africa.**

- i. Improve access of rural communities to Telecommunication/ICT services and e-applications to assist in development;
- ii. Develop e-government applications to allow easy access to all government services;
- iii. Develop e-Health and Telemedicine initiatives and applications to improve access to health services, in particular in rural and isolated areas;
- iv. Develop e-environment awareness programs to protect the continent environment from misuse (e.g. harmful chemicals and nuclear waste disposals), and to preserve natural resources.
- v. Provide access to public information and to the cultural, historic, scientific and educational heritage of Africa, including its preservation on digital media.

### **2. Build confidence in the development and use of Telecommunication/ICT applications, taking into account better management of the cyberspace, from the producer as well as from the consumer point of view.**

- i. Adopt policy on electronic transactions by adopting policies including issues related to privacy, data protection, authentication, intellectual property rights, copyright, computer crime and security.
- ii. Establish consumer associations to defend consumers' rights.

### **3. Promote the development and use of open source softwares, and build applications on such platforms.**

- i. Develop user-friendly and affordable software platforms, browsers and interactive applications, and diverse, locally produced multimedia content.
- ii. Promote the development and use of open-source software and free software.

## **F. Development of African Content**

### **1. Preserve the African heritage in a digital format, and its relevant Intellectual property rights.**

- i. Develop content and access for e-learning to reduce illiteracy and create equal opportunity for education, taking into account cultural heritage of Africa;

### **2. Encourage creation of African content in diverse languages.**

- i. Develop content relevant to the needs of the developing world, including material in indigenous languages, information accessible to non-literate audiences

### **3. Promote global presence of the African heritage cultures, and indigenous knowledge;**

- i. Promote and develop specific African content to preserve and increase global presence of the African values, cultures, languages and indigenous knowledge;
- ii. Improve awareness of producers by regional distribution channels.

## **G. Mobilization of Financial Resources**

### **1. Raise political awareness to consider Telecommunication/ICT as a priority sector in social economic development.**

- i. Correlate the direct and indirect benefit factors of the telecommunication/ICT sector to the national GDP (Gross Domestic Production) to encourage Governments to promote the Telecommunication/ICT sector.

### **2. Allocate public resources for Telecommunication/ICT development.**

- i. Advice Governments to contribute in investments directed to Telecommunication/ICT enhancement in backbones, rural and isolated Areas.

### **3. Promote public private partnerships and other multi-stakeholders partnerships.**

- i. Work with development finance institutions, donor and Governments, in the continent and internationally, to mobilize sustainable financing,

especially through multilateral processes, with a view to securing grants and concession funds to mitigate medium-term risks;

- ii. Promote the participation in the Digital Solidarity Fund (DSF);
- iii. Promotion of PPP (Public Private Partnership) on national and regional basis.

**4. Create incentives for foreign investments and coordinate its usage,**

- i. Develop financial and infrastructure risk management plans.
- ii. Address key issues such as: incentives for investors (e.g: low interest rates, risk guaranties, risk reduction and mitigation, financing risky and less profitable projects), financing strategic infrastructures like regional IXPs, submarine cable projects, ... etc;
- iii. Awareness and mobilization of African Diaspora to finance regional Telecommunication/ICT projects.

**5. Promote the development of domestic finance by providing support to local entrepreneurs and investors.**

- i. Promote micro-financing mechanisms to incorporate small domestic investor in the Telecommunication/ICT development process.
- ii. Establish Telecommunication/ICT business incubators.

**6. Develop innovative approaches for the creation and management of universal access/service funds.**

- i. Conduct studies and implement pilot projects

**7. Increase awareness, mobilization, coordination and efficiency on regional, continental and international initiatives and projects for Telecommunication/ICT development**

- i. Set sound and efficient procedures to mobilize and coordinate the use of domestic and foreign direct resources for regional Telecommunication/ICT infrastructures projects;

### **3.4. Priority Programmes**

Among the various activities of the programme of action, it proposed that the following activities constitute a priority programme to be carrying out at national, regional and continental level.

#### **A. At continental level (AU)**

1. Development and adoption of policy and regulatory Guidelines.
2. Supporting deployment of regional and continental broadband infrastructures/networks and promoting their interconnection;
3. Promoting development and interconnection of governmental Telecommunication/ICT networks;
4. Initiating and supporting fora for sharing of knowledge, resources and experience among Telecommunication/ICT development stakeholders;
5. Providing expertise to RECs/Governments aimed at translating continental Policy and Regulatory Guidelines into regional/national frameworks.
6. Measuring and monitoring the development of growth of Telecommunication/ICT industry.

#### **B. At regional level (RECs)**

1. Development and adoption of policy and regulatory regional Guidelines;
2. Promoting interconnection of national networks;
3. Initiating and supporting fora for sharing of knowledge, resources and experience among Telecommunication/ICT -development stakeholders;
4. Providing expertise to Governments aimed at translating Regional Policy and Regulatory Guidelines into national frameworks.
5. Measuring and monitoring the development of growth of Telecommunication/ICT industry.

#### **C. At national level**

1. Formulation, adoption and implementation of national Telecommunication/ICT policies taking into account inputs from stakeholders (including consumers);
2. Creating an enabling environment taking into account the convergence of technologies, networks and services;
3. Deployment of Telecommunication/ICT broadband (backbone and access) infrastructures;
4. Formulation, adoption and implementation of national e-strategies.
5. Continuation of the deployment of public Telecommunication/ICT access points in rural and remote areas;
6. Building Telecommunication/ICT skills and high-level institutions;
7. Measuring and monitoring the development of growth of Telecommunication/ICT industry.

### 3.5. Priority Studies

To support and speed up the implementation off the programme of action in particular the priority programme , the studies hereafter are proposed.

<b>Table 3.1 Studies identified</b>		
<b>Field of Study</b>	<b>Study</b>	<b>Deliverables</b>
1. Policy Guidelines	Develop model of policy guidelines for the continent on: <ul style="list-style-type: none"> <li>▪ Liberalization &amp; Privatization.</li> <li>▪ Creation of effective Regulatory Body.</li> <li>▪ Competition</li> <li>▪ Convergence.</li> <li>▪ Universal access/service.</li> <li>▪ Digital Migration.</li> <li>▪ Process of Consensus building in international foras.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Comparative analysis of Country and Regional Policies.</li> <li>▪ Model Policy.</li> <li>▪ Harmonization methodology.</li> <li>▪ Consensus building mechanism.</li> <li>▪ Digital migration strategy.</li> </ul>
2. Model Legislation and Regulatory framework	<ul style="list-style-type: none"> <li>▪ Develop model Telecom/ICT Bill of Low</li> <li>▪ Develop model Telecom/ICT Regulations.</li> <li>▪ Assess the need for a Continent-wide Regulatory Body.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Comparative analysis of Countries and Regional Telecom Act.</li> <li>▪ Model Telecommunication/ICT Bill.</li> <li>▪ Model Regulatory Institutional structure.</li> <li>▪ Model Telecom/ICT Regulations.</li> <li>▪ Model License</li> <li>▪ Recommendation on the creation of a continental Telecommunication/ICT Regulatory Body/Regulators Association.</li> </ul>
3. Infrastructure Master Plan	<ul style="list-style-type: none"> <li>▪ Development of Telecommunication/ICT Infrastructure Master Plan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Analysis of current National and Regional Telecommunication/ICT infrastructure and missing links.</li> <li>▪ National Regional and Continental Master plans.</li> </ul>
4. Capacity Building	<ul style="list-style-type: none"> <li>▪ Assess the existing institutional capacity</li> <li>▪ Assess professional human resource capacities and skill</li> <li>▪ Develop continental policy and implement strategy on capacity building.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Database of existing Capacity Building Institutions and assessment of their capabilities.</li> <li>▪ GAP analysis comparing the actual use of resources with the potential resources, including the expertise of the African Diaspora.</li> <li>▪ African Human Resource Capacity Building Policy and Implementation Plan.</li> </ul>
5. Mobilization of Financial resources	<ul style="list-style-type: none"> <li>▪ Identify potential sources of funds</li> <li>▪ Establish Coordination mechanism for Pulling of resources and common projects including PPP.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mechanism for pulling of resources for common projects.</li> <li>▪ Incentives for raising domestic and foreign investment.</li> </ul>

### **3.6. Implementation of the Reference Framework for the Harmonization of Telecom/ICT Policy and Regulation in Africa**

The proposed reference policy and regulation framework will provide a catalytic platform that is aimed at creating a harmonized regional and continental policy and regulatory environment. The implementation requires appropriate institutional framework and mobilization of sufficient resources as detailed below.

#### **6.3.1. Institutional Framework for Implementation**

The institutional framework for implementation of the conclusions of this study is detailed as follows:

##### **a. The Main Stakeholders and their Missions:**

###### **1. *The Regional Economic Communities: implementation agencies***

The RECs will be the driving force for the implementation of the framework in their respective regions. The RECs will benefit from the Advice and inputs from the Telecommunication/ICT Policy and Regulations Expert Group.

The tasks that have been identified for the RECs for the purpose of the implementation process will include:

- Develop and implement capacity building programs;
- Translate continental reference framework to regional guidelines.
- Provide Assistance to Member States to translate regional guidelines at the national level;
- Participate in carrying out the priority studies;
- Support and cooperate with regional associations of regulators and operators and;
- Gather and analyze information on the implementation process.

It is expected that ECA, ITU, ATU and ADB including Development Partners will support the RECs in implementing the reference policy and regulatory framework.

###### **2. *African Union Commission (AUC)***

The AUC will:

- Supervise and coordinate the implementation of the policy and regulatory framework.
- Mobilize financial resources to support implementation activities of the reference framework.
- Organize continental meetings on Telecommunication/ICT Policy and Regulations.
- Provide a model of guidelines as indicated in chapter 3.4 above
- Establish an African expert Telecommunication/ICT Group.

### **3. African Telecommunication/ICT Policy and Regulation Expert Group**

The African Expert Group shall consist of between seven (7) to ten (10) individual African experts selected on the basis of their expertise, gender and regional representation. This African expert Group will report to the AU commissioners responsible for Telecommunication/ICT:

- To provide advise to the AU commissioners responsible for Telecommunication/ICT on the implementation of the reference framework.
- To undertake the various studies required for the implementation of the reference framework.
- To prepare all the documentation required for the implementation of the reference policy and regulatory framework.
- To provide technical support to the RECs on the implementation of the reference policy and regulatory framework.
- To submit regular reports of its activities to the AU Commissioners responsible for Telecommunication/ICT
- Undertake any other activities as maybe initiated and directed by the AU Commissioners responsible for Telecommunication/ICT.

### **4. Steering Committee**

A Steering Committee shall be established which shall consist of the representatives of the RECs, NEPAD, AfDB, ATU, RASCOM, African regional/international Organizations UNECA, ITU, ) and other observers as may be decided by the AUC; and shall be chaired by the AU Commissioners responsible for Telecommunication/ICT. The Steering Committee will mainly take the responsibility of coordination among the RECs regarding the implementation of the reference Telecommunication/ICT policy and regulatory framework, while taking input from the other participants and observers.

The Steering Committee will carry out its mandate and submit its reports to the AUC for consideration and input for the report of the AU to the African Communication and Information Technologies (CIT) Ministerial Conference. The Terms of Reference for the Steering Committee shall include, *inter-alia*;

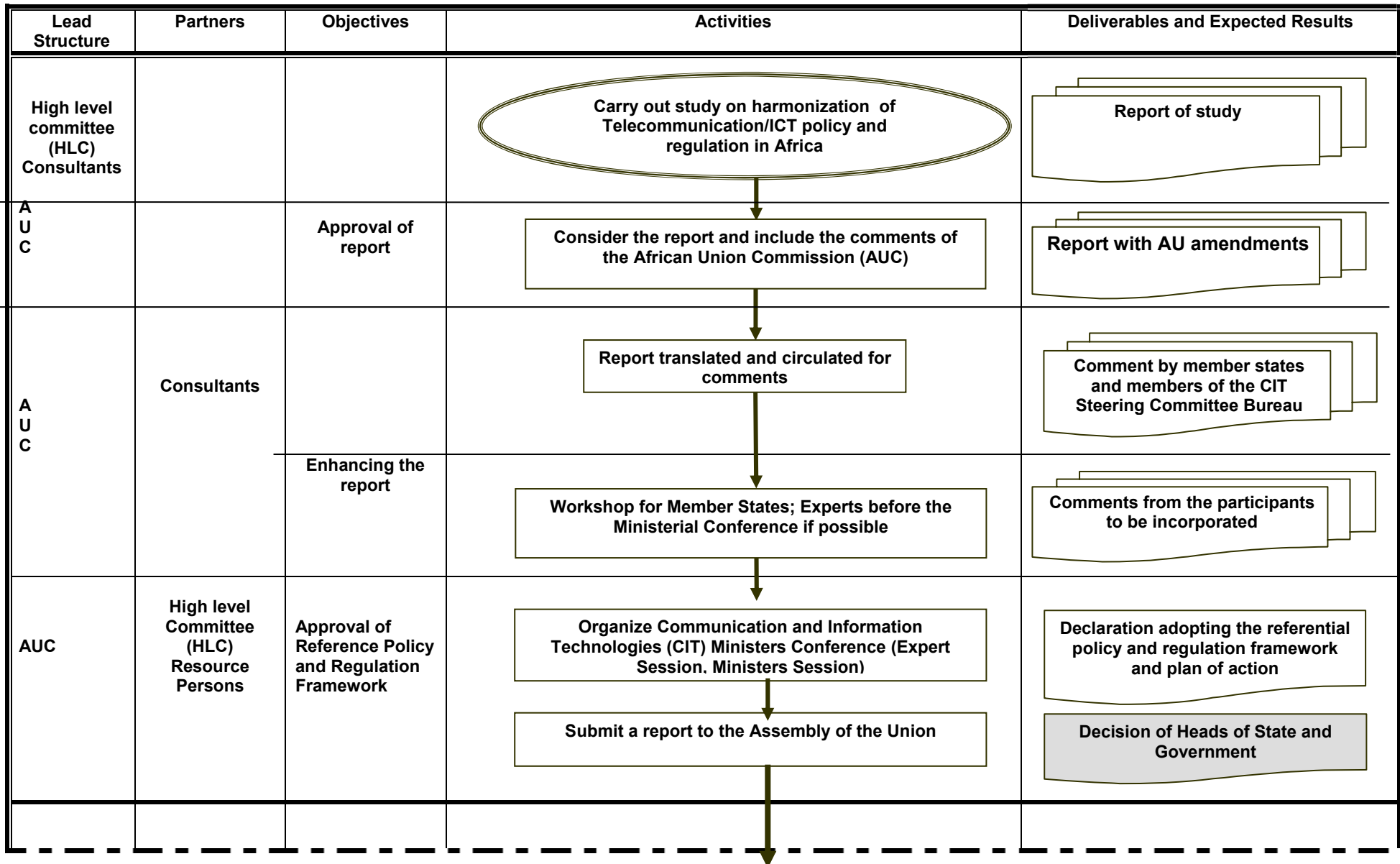
- To meet at least twice annually to assess progress of the implementation of the reference policy and regulatory framework.
- Examine the outcomes of the priority studies; provide inputs and proposals for the attention of the African Union, and the RECs, AU Commissioners responsible for Telecommunication/ICT to accelerate the implementation process.

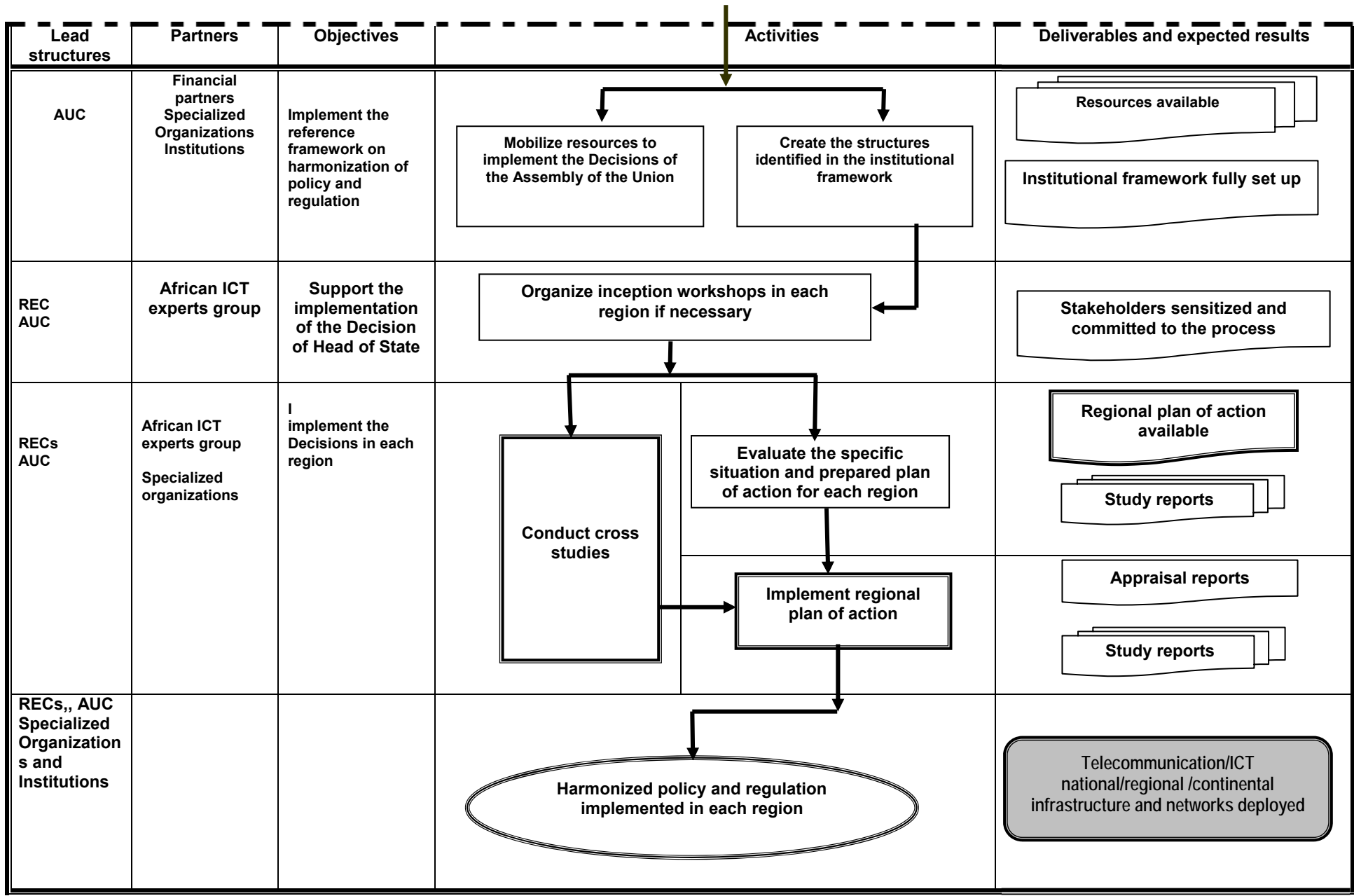
#### **b. Implementation diagramme**

The diagramme hereunder, shows the process starting from carrying out the study on the reference framework up to the adoption and implementation of the conclusions of the outcomes of study.



### Implementation diagramme





### 3.6.2 Implementation Planning

Activities	Year 2008								Year 2009												Year 2009				
	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	
1 CIT Ministers Conference	—																								
2 Finalize and translate reports of the study by incorporating comment of Experts Meeting	—	—																							
3 Organize regional workshops					—	—	—	—																	
4 Mobilize Financial Resources and set Institutional structures			—	—	—	—	—	—																	
5 Implement Programme of Action approved by CIT Ministers Conference				—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6 Carry out priority studies approved by CIT Ministers Conference				—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 3.6.3. Budget Estimates for Implementation of the Study Conclusions

Activities		Units	Quantity	Unit Price (in US\$ 000)	Total Cost (in US\$ 000)
<b>I. Conduct Priorities studies and support the RECs in preparing their Regional Plan of Action for harmonization of Policies and regulation</b>					
1.1	Ten (10) part-time consultants (for total duration of eight (8) months over two (2) years	Man x months	10 X8	6.5	520
1.2	Missions to the RECs;				
	Transport	Unit	4 x 2 x 10	1.5	120
	Mission allowance	Man x Day	50 x 10	0.18	90
1.3	Incidentals: Computer consumables, documents translation and reproduction				20
<b>Sub-Total: I</b>					<b>750</b>
<b>II. Coordination and Management Activities</b>					
2.1	Periodic meetings of the RECs	Units	3 Meeting x 2 years	30	180
2.2	Meetings of the 10 Consultants at AUC Head Quarters (Addis Ababa)	Units	3 Meeting x 2 years	20	120
<b>Sub-Total: II</b>					<b>300</b>
<b>III. Support to the RECs/Consultancy</b>					
3.1	Support to RECS to Evaluation of existing policies and formulation of new policies based on the Reference Framework recommended above	Lump sum	8 RECs	500	4,000
<b>Sub-Total: III</b>					<b>4,000</b>
<b>Total I+II+III</b>					<b>5,050</b>
<b>Contingencies and incidentals</b>					<b>250</b>
<b>Grand Total (in US \$ 000)</b>					<b>5,300</b>

## V. CONCLUSION

From analysis of the current situation, the study has highlighted that on several levels Africa's Telecommunications and ICT sector is facing with a lot of challenges. Then, to create an environment conducive to its development, it is proposed that technological convergence and interoperability, building broadband infrastructures and reinforcement of the African internet network, capacity building, mobilization and efficient use of financial resources, industrialization, research and development, be the priority areas to address.

To address the challenges of Telecommunications and ICT sector development, Africa's major stakeholders, especially member States with the support of regional and international organizations and Institutions, have embarked on implementation of policies and projects aimed primarily at building the sector capacities and infrastructures.

The African Union Commission has initiated this study on the Reference Framework for the Harmonization of Telecommunication/ICT Policies and Regulation in Africa as its contribution to the development of telecommunications /ICT sector in Africa, that is a factor to attain its ultimate goal of rapid integration and sustainable development of the continent.

The outcomes of this study, intended mostly for RECs and Member States, will guide and promote the creation of an environment conducive to the development of continental and regional Telecommunication/ICT networks and services.

The major parts of the proposed Reference framework include:

- Broad objectives,
- Strategies to achieve the objectives,
- Priority programmes,
- Priority studies and
- The implementation process.

The estimated total budget necessary for the implementation of the Reference Framework including development of guideline is 5.3 Millions US Dollars and the expected planned duration for the implementation is 2 years.

## Acronymes and Abbreviations

<b>AFRALTI</b>	African Advanced Level Telecommunications Institute
<b>AfDB</b>	African Development Bank
<b>AfriNic</b>	African Internet Number Registry IP Addresses
<b>AFUR</b>	African Forum for Utility Regulation
<b>ARAPKE</b>	African Regional Action Plan for the Knowledge Economy
<b>ARICEA</b>	Association of Regulators For Information and Communication in Eastern and Southern Africa
<b>ARTAC</b>	Association of Central Africa Telecommunications Regulators
<b>ATRN</b>	African Telecommunications Regulator's Network
<b>ATU</b>	African Telecommunication Union
<b>AUC</b>	African Union Commission
<b>BDT</b>	Telecommunications Development Bureau
<b>CEMAC</b>	Economic and Monetary Community of Central Africa
<b>CEN SAD</b>	Community of Sahel-Saharan States
<b>COMESA</b>	Common Market for Eastern and Southern Africa
<b>CRASA</b>	Communications Regulators Association of Southern Africa
<b>EAC</b>	East African Community
<b>EARPTO</b>	East African Regulatory Post and Telecommunication Organization
<b>ECA</b>	United Nation Economic Commission for Africa
<b>ECCAS</b>	Economic Community of Central African States
<b>ECOWAS</b>	Economic Community of West African States
<b>ESMT</b>	Ecole Supérieure Multinationale des Télécommunications
<b>FTRA</b>	Forum of Telecommunications Regulation in Africa
<b>GDP</b>	Gross Domestic Product
<b>GSM</b>	Global System for Mobile Communication
<b>IGAD</b>	Intergovernmental Authority for Development
<b>ITU</b>	International Telecommunication Union
<b>IXP</b>	Internet Exchange Point
<b>Mbps</b>	Megabits per second
<b>MDG</b>	Millennium Development Goals
<b>NEPAD</b>	New Partnership for Africa' s Development
<b>NICI-Plan</b>	National Information and Communication Infrastructure- Plan
<b>PAPU</b>	Pan African Postal Union
<b>RASCOM</b>	Regional African Satellite Communications Organization
<b>REC</b>	Regional Economic Community
<b>SADC</b>	Southern African Development Community
<b>SIM</b>	Subscriber Identity Module (Module d'Identification d'abonné Mobile)
<b>UEMOA</b>	West African Economic and Monetary Union
<b>UMA</b>	Arab Magreb Union
<b>VoIP</b>	Voice Over IP
<b>VSAT</b>	Very Small Terminal
<b>WATRA</b>	West Africa Telecommunications Regulators' Association
<b>WIFI</b>	Wireless Fidelity
<b>WIMAX</b>	Worldwide Interoperability for Microwave Access
<b>xDSL</b>	ADSL: Asymmetric Digital Subscriber Line; SDSL: Symmetric Digital Subscriber Line;

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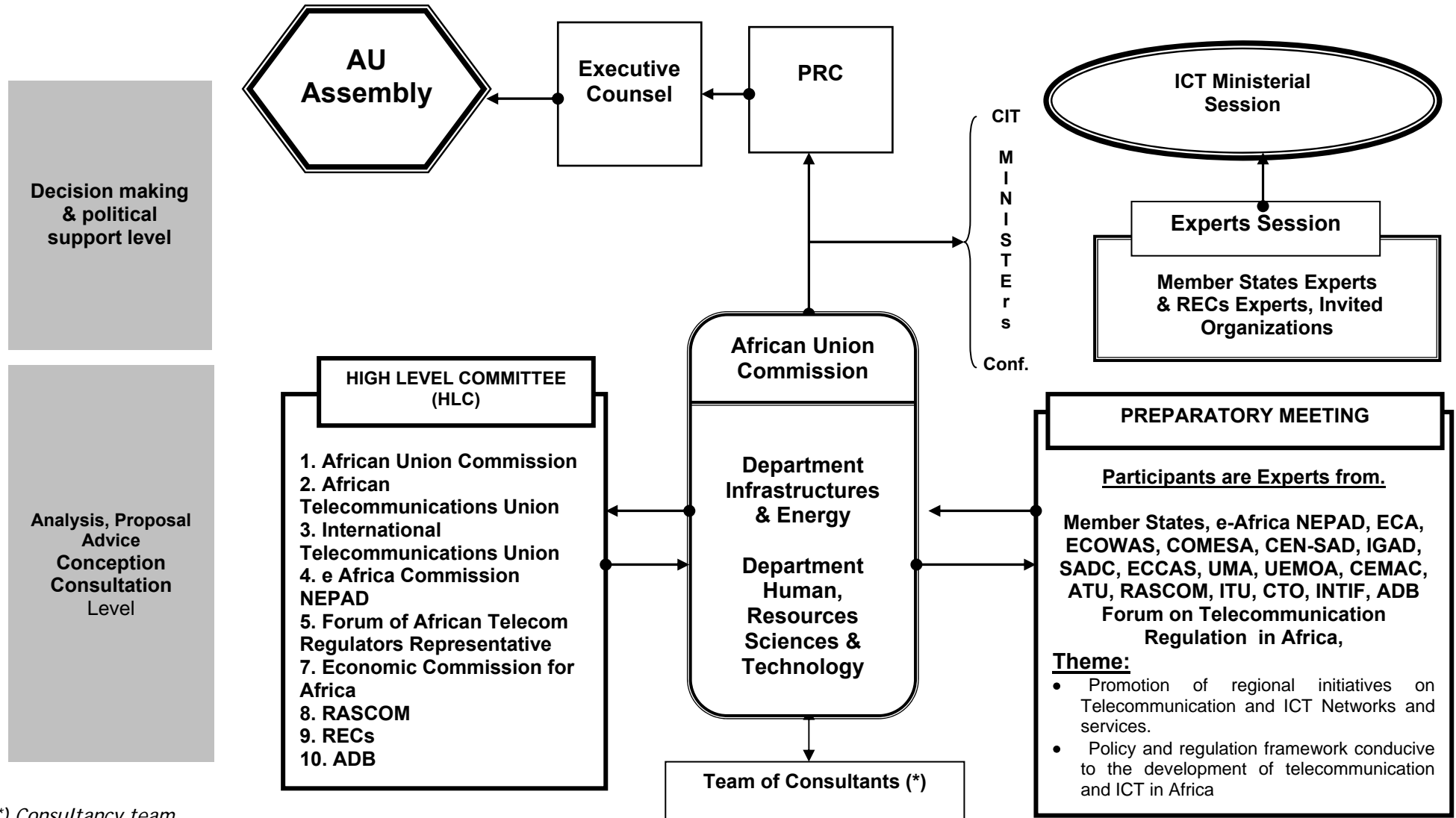
S/N	Title
1.	Declaration of African Ministers in charge of Telecommunications and ICT, Ministerial Colloquium, Abuja, Jully 2005.
2.	Declaration of Conference of African Ministers in charge of Communications and Information Technology, Cairo, April 2006
3.	African Regional Action Plan for the Knowledge Economy (2006)
4.	Study on the creation of the Association of African Telecommunication Regulators, ITU, 2005
5.	Declaration of Principles and Action Plan: First Phase of the World Summit on Information Society (WSIS) Geneva, 2003
6.	Declaration and Action Plan of WSIS (Geneva 2003) ; Agenda and Commitments of WISIS (Tunisia, November 2005)
7.	Protocol on the Policy and Regulatory Framework for NEPAD Broadband Infrastructure Network for Eastern and Southern Africa
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S/N	Title
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## **ANNEXES**

# ANNEX: 1 - Organization for the implementation of the Study and approval of conclusions



(\*) *Consultancy team*

Dr Bonkougou Zouli, Mrs Namahoua BambaTouré; Dr Sherif Guinena; Mr Emmanuel Kamdem; Mr Samuel Chepkonga; Mr Eddie Funde; Mr Shola Taylor.

The High Level Committee (HLC) and The Team of Consultants	HLC Meetings
<p>The High Level Committee (HLC), has been an essential component to carry out of the study. The HLC is composed of experts coming from:</p> <ul style="list-style-type: none"> <li>• The African Union Commission;</li> <li>• The Regional Economic Communities (RECs);</li> <li>• Regional and international Agencies specialized in Telecommunications and ICT: African Telecommunications Union (ATU), International Telecommunications Union (ITU), African Telecommunication Regulators Forum (FTRA), Economic Commission for Africa (ECA);</li> <li>• The e-Africa Commission NEPAD;</li> <li>• A team of consultants recruited by the African Union Commission.</li> </ul> <p>The team of consultants has worked under the supervision of the Department of Infrastructure and Energy.</p> <p>The High-Level Committee is mandated to:</p> <ul style="list-style-type: none"> <li>• Support the African Union and contribute in the study;</li> <li>• Consider, make recommendations, and adopt the report of the consultants;</li> <li>• Make presentation on specifics themes during the Preparatory Meetings;</li> </ul> <p>The consultants that were selected to carry out the study are Mrs Namahoua Bamba Touré, Dr Sherif Guinena, Mr Emmanuel Kamdem, Mr Samuel Chepkonga, Mr Eddie Funde and Mr Shola Taylor. The consultants worked under the guidance of, Dr Zouli Bonkougou, AUC Consultant for Telecommunication/ICT matters.</p>	<p><b>First Meeting: 19 – 20 July 2006, Addis Ababa</b></p> <p>The main objectives, of the meeting to:</p> <ul style="list-style-type: none"> <li>• Adoption of the Methodological approach</li> <li>• Presentation and discussion of themes related to Telecommunication and ICT Policies and regulation:</li> </ul> <p><b>Second Meeting: 14 – 16 September 2006, Nairobi</b></p> <p>The main objectives, of the meeting to:</p> <ul style="list-style-type: none"> <li>• Consider the progress report of the consultants and make recommendation to pursuit the study;</li> <li>• To have presentations and discussion on issues related to policy and regulation completing the first serial of themes presented during the first meeting;</li> </ul> <p><b>Third Meeting: 08 – 09 March 2007, Addis Ababa</b></p> <p>The draft report of the study elaborated by the consultants was presented. The meeting considered the draft report and has requested the consultants to finalize it by deepen and completed some keys elements.:</p> <p><b>Fourth Meeting: 03– 05 October 2007, Addis Ababa</b></p> <p>The final draft report of the consultants was adopted by the HLC and transmitted to the African Union Commission for consideration and presentation to the African Communication and Information Technologies Ministerial Conference</p>
<p align="center"><b>Meeting of the Ministerial Bureau of the Conference of African Ministers in charge of Communications and Information Technology , Cairo on April 27, 2007.</b></p> <p>In the process of adoption of the Reference Framework for the harmonization of Telecommunications and ICT policies and regulatory practices in Africa, it is expected that the conclusions of the study be presented to the next conference of the African Ministers irresponsible for CIT. With this intention, a synthesis of the content of the study was presented to the meeting of the Ministerial Bureau of the Conference of African CIT Ministers, Cairo, April 2007, The meeting noted:</p> <ul style="list-style-type: none"> <li>• Need for having a full report on the study and the importance of widen consultation with regard to the policy framework;</li> <li>• That the study should approach the process of harmonization and the mechanism of achievement of the conformity of the policies to this harmonization;</li> </ul> <p>The meeting made praise of the study and agreed that if the study is well lead to carry out a consensus, it will offer a good example to the international ICT community.</p>	

## Annex: 2. - Repartition of Countries Region and CER

No	African Union Member States	CENSAD (25)	COMESA (20)	EAC (5)	ECCAS (11)	ECOWAS (15)	IGAD (7)	SADC (15)	UMA (4)	Total
<b>Northern Africa (6)</b>										
1	Algeria								✓	1
2	Egypt	✓	✓							2
3	Libya	✓	✓						✓	3
4	Mauritania								✓	1
5	Tunisia	✓							✓	2
6	Sahara A D R									0
<b>Central Africa (9)</b>										
7	Burundi		✓	✓	✓					3
8	Cameroon				✓					1
9	Central African Republic	✓			✓					2
10	Chad	✓			✓					2
11	Congo				✓					1
12	D Republic of Congo		✓		✓			✓		3
13	Equatorial Guinea				✓					1
14	Gabon				✓					1
15	Sao Tome & Principe				✓					1
<b>Southern Africa (10)</b>										
16	Angola		✓		✓			✓		3
17	Botswana							✓		2
18	Lesotho							✓		1
19	Malawi		✓					✓		2
20	Mozambique							✓		1
21	Namibia							✓		1
22	South Africa							✓		1
23	Swaziland		✓					✓		2
24	Zambia		✓					✓		2
25	Zimbabwe		✓					✓		2

No	African Union Member States	CENSAD (25)	COMES A (20)	EAC (5)	ECCAS (11)	ECOWAS (15)	IGAD (7)	SADC (15)	UMA (4)	Total
<b>East Africa (13)</b>										
26	Comoros	✓	✓							2
27	Djibouti	✓	✓				✓			3
28	Eritrea	✓	✓				✓			3
29	Ethiopia		✓				✓			2
30	Kenya		✓	✓			✓			3
31	Madagascar		✓					✓		2
32	Mauritius		✓					✓		2
33	Rwanda		✓	✓	✓					3
34	Seychelles		✓					✓		2
35	Somalia	✓					✓			2
36	Sudan	✓	✓				✓			3
37	Tanzania			✓				✓		2
38	Uganda		✓	✓			✓			3
<b>West Africa (15)</b>										
39	Benin	✓				✓				2
40	Burkina Faso	✓				✓				2
41	Cape Verde					✓				1
42	Cote d'Ivoire	✓				✓				2
43	The Gambia	✓				✓				2
44	Ghana	✓				✓				2
45	Guinea	✓				✓				2
46	Guinea Bissau	✓				✓				2
47	Liberia	✓				✓				2
48	Mali	✓				✓				2
49	Niger	✓				✓				2
50	Nigeria	✓				✓				2
51	Senegal	✓				✓				2
52	Sierra Leone	✓				✓				2
53	Togo	✓				✓				2

### Annex: 3 Statistics of Telecoms/ICT of African Countries and Regions (Extract from UIT sources 2005, 2006)

Countries and Regions	Years	Population (millions)	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		Total in Mbps of International Bandwidth
			Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Subscribers(x000)	
Angola	2004	14.08	94.3	0.67	740	5.26	834.3	5.9	75	40.9	N/A
	2006	15.8	98.2	8.52	2264.2	14.33	2362.4	14.95	2460	nd	N/A
South Africa	2004	47.21	4850	10.27	20839	44.14	25689	54.4	3566	3566	60
	2006	47.59	4729	9.97	39662	83.33	44391	93.2	5100	4279	165.3
Botswana	2004	1.77	136.5	7.71	522.8	29.55	659.3	37.2	60	15	N/A
	2006	1.76	136.9	7.78	823.1	46.78	960	54.54	80	N/A	1.8
Lesotho	2004	1.8	37.2	2.07	196.2	10.9	233.4	12.5	43	2.4	N/A
	2006	1.79	53.1	2.97	357.9	44.4	411	22.96	51.5	2.6	N/A
Malawi	2004	12.34	93	0.75	222.1	1.8	315.1	2.5	46.1	16.2	0.1
	2006	13.17	102.7	0.8	429.3	3.33	532	4.03	59.7	15	0.4
Mozambique	2004	18.96	69.7	0.37	708	3.73	777.7	4.1	138	6.1	N/A
	2006	20.16	67	0.33	2339.3	11.6	2406.3	11.9	178	N/A	N/A
Namibia	2004	2.01	127.9	6.36	286.1	14.23	414	20.6	75	19	N/A
	2006	2.05	138.9	6.84	495	24.37	633.9	30.9	80.6	20.9	N/A
Swaziland	2004	1.08	44.5	4.1	145	13.39	189.5	17.5	36	5.6	N/A
	2006	1.03	44	4.27	250	24.29	294	28.5	42	7	N/A
Zambia	2004	11.48	91.7	0.8	464.4	4.05	556.1	4.8	231	16.5	0.2
	2006	11.86	93.4	0.79	1663.3	14.02	1756.7	14.8	500	9	2.3
Zimbabwe	2004	11.89	317	2.67	425.7	3.58	742.7	6.24	820	90	9
	2006	13.08	335.6	2.56	849.1	6.49	1184.7	9.05	1220	97	10.2
<b>Total Southern Africa</b>	2004	122.62	5861.8	4.99	24549.3	20.02	30411.1	24.79	5090.1	3777.7	
	2006	128.29	5798.8	4.59	49133.2	38.9	54932	43.49	9771.8	4430.5	

Countries and Regions	Years	Population (millions)	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		Total in Mbps of International Bandwidth
			Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Subscribers(x000)	
Benin	2004	7.26	72.8	1	459.3	6.33	532.1	7.3	90	6.7	0.3
	2006	8.7	77.3	0.89	1055.7	12.13	1133	13	150	7.5	1.5
Burkina Faso	2004	13.39	85.2	0.64	395.9	2.96	481.1	3.6	53.2	7.3	0.2
	2006	13.73	94.8	0.7	1016.6	7.46	1111.4	8.09	80	9.2	1.7
Cape verde	2004	0.47	71.7	15.63	53.3	11.63	125	26.5	25	5	N/A
	2006	0.52	71.6	13.8	108.9	20.99	180.5	34.7	33	7.5	1.8
Cote d'Ivoire	2004	16.9	257.9	1.53	1674.3	9.91	1932.2	11.4	160	13.7	0.8
	2006	18.45	260.9	1.41	4065.4	22.03	4326.3	23.4	300	18	1.2
Gambia	2004	1.46	43	2.94	175	11.97	218	14.9	49	4	N/A
	2006	1.56	46.3	2.98	404.3	25.99	450.6	28.8	82.3	2.1	0.1
Ghana	2004	21.38	313.3	1.47	1695	7.93	2008.3	9.4	368	20.1	0.9
	2006	22.56	356.4	1.58	5207.2	23.09	5563.6	24.6	609.8	21.8	12.7
Guinea	2004	7.8	26.2	0.34	154.9	1.99	181.1	2.3	46	11	N/A
	2006	8.6	26.3	0.33	189	2.19	215.3	2.5	50	11	N/A
Guinea Bissau	2004	1.31	9.7	0.74	39.5	3.02	49.2	3.7	26	0.2	N/A
	2006	1.63	6.8	0.42	150.5	9.22	157.3	9.6	37	0.2	N/A
Liberia	2004	3.49	6.9	0.21	94.4	2.71	101.3	2.9	43	2.4	N/A
	2006	3.36	6.9	0.21	160	4.87	166.9	4.9	51.5	2.6	N/A
Mali	2004	11.1	65.8	0.59	222.1	1.8	287.9	2.6	50	50	N/A
	2006	13.92	82.5	0.59	1512.9	10.87	1595.4	11.4	59.7	15	0.7
Niger	2004	12.42	24.1	0.19	172.4	1.39	196.5	1.6	25	3.1	0.1
	2006	14.43	24	0.17	323.9	2.32	347.9	2.4	80.6	20.9	0.2
Nigeria	2004	127.12	1027.5	0.81	9147.2	7.2	10174.7	8	1769.7	53.2	N/A
	2006	134.38	1688	1.26	32322.2	24.05	34010.2	25.3	8000	2000	0.5
Senegal	2004	10.34	244.9	2.37	1121.3	10.85	1366.2	13.2	482	19.4	7.7
	2006	11.94	282.6	2.37	2982.6	24.99	3265.2	27.3	650	30.4	28.9
Sierra Leone	2004	5.34	24	0.49	113.2	2.21	137.2	2.56	10	0.8	N/A
	2006	5.68	24	0.49	113.2	2.21	137.2	2.4	10	10	N/A
Togo	2004	5.02	65.9	1.31	332.6	6.63	398.5	7.9	221	12.5	4.41
	2006	6.31	82.1	1.3	5766.6	14.78	5848.7	9.26	320	12.5	N/A
Total West Africa	2004	244.8	2338.9	0.95	15850.4	6.47	18189.3	7.4	3417.9	209.4	
	2006	265.77	3130.5	1.17	55379	20.83	58509.5	22	10513.9	2168.7	

Countries and Regions	Years	Population (millions)	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		Total in Mbps of International Bandwidth
			Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Subscribers(x000)	
Comoros	2004	0.79	15.1	1.91	8.4	1.06	23.5	2.97	8	0.9	N/A
	2006	0.82	19.1	2.33	36.9	4.5	56	6.8	21	1.8	N/A
Djibouti	2004	0.68	11.1	1.63	34.5	5.07	45.6	6.7	9	3.9	N/A
	2006	0.81	10.8	1.56	44.1	6.37	54.9	6.7	11	3.5	N/A
Eritrea	2004	4.22	39.3	0.93	20	0.47	59.3	1.4	50	3.5	N/A
	2006	4.56	37.5	0.82	62	1.36	99.5	2.1	100	5.2	N/A
Ethiopia	2004	72.42	484.4	0.67	155.5	0.21	639.9	0.88	113	12.2	N/A
	2006	79.29	725	0.91	866.7	1.09	1591.7	2	164	25.7	0.3
Kenya	2004	32.81	299.3	0.91	2546.2	7.76	2845.5	8.6	1054.9	70	N/A
	2006	35.11	293.4	0.84	7340.3	20.91	7633.7	21.7	2770.3	186.8	N/A
Madagascar	2004	18.11	58.7	0.32	333.9	1.84	392.6	2.16	90	10.5	N/A
	2006	19.1	129.8	0.68	1045.9	5.47	1175.7	6.15	110	19.9	N/A
Mauritius	2004	1.23	353.8	28.69	547.7	44.42	901.5	73.2	240	80.1	2.6
	2006	1.26	357.3	28.45	772.4	61.5	1129.7	89.65	300	137.5	21.9
Rwanda	2004	8.48	23	0.27	137.3	1.62	160.3	1.89	38	2.9	1.1
	2006	9.23	16.5	0.18	314.2	3.4	330.7	3.58	50	4.3	1.7
Seychelles	2004	0.08	21.3	26.61	54.4	68.04	75.7	94.6	20	3.3	0.3
	2006	0.08	20.7	25.44	70.3	86.52	91	113.7	29	5	2.5
Somalia	2004	7.96	100	1.26	500	6.28	600	7.5	86	9	N/A
	2006	8.5	100	1.22	500	6.08	600	7	94	9	N/A
Sudan	2004	34.51	1028.9	2.98	1048.6	3.04	2077.5	6	1140	300	0.8
	2006	36.99	636.9	1.72	4683.1	12.66	5320	14.3	3500	850	2.1
Tanzania	2004	37.63	148.4	0.39	1942	5.16	2090.4	5.5	333	50	N/A
	2006	39.02	157.3	0.4	5766.6	14.78	5923.9	15.18	384.3	50	N/A
Uganda	2004	27.82	71.6	0.26	1165	4.19	1236.6	4.44	200	8	N/A
	2006	29.86	108.1	0.36	2008.8	6.73	2116.9	7.08	750	8	1.2
Total East Africa	2004	246.74	2654.9	1.07	8493.5	3.44	11148.4	4.5	3381.9	554.3	
	2006	264.63	2612.4	0.98	23511.3	8.8	26123.7	9.8	8283.6	1306.7	



Countries and Regions	Years	Population (millions)	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		Total in Mbps of International Bandwidth
			Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Suscribers(x000)	
Burundi	2004	7.07	27.7	0.39	100.6	1.42	128.3	1.8	25	1	N/A
	2006	7.83	31.1	0.41	153	2.03	184.1	2.3	60	1	N/A
Cameroon	2004	16.3	99.4	0.61	1530.9	9.36	1630.3	10	170	11	N/A
	2006	16.6	130.7	0.79	3135.9	18.89	3266.6	19.6	370	15	0.2
Central African Rep	2004	3.91	10	0.26	60	1.53	70	1.7	9	2	N/A
	2006	4.09	10	0.25	100	2.48	110	2.6	13	2.5	N/A
Congo	2004	3.82	13.8	0.36	383.7	10.05	397.5	10.4	36	1	N/A
	2006	4.12	15.9	0.4	490	12.25	505.9	12.27	70	1	N/A
Congo RD	2004	55.85	10.5	0.02	1990.7	3.56	2001.2	3.58	112.5	17	1.4
	2006	59.32	9.7	0.02	4415.5	7.44	4425.2	7.45	180	33.8	1.5
Gabon	2004	1.35	38.7	2.86	489.4	36.2	528.1	39.1	40	7.8	0.6
	2006	1.41	36.5	2.59	764.7	54.39	801.2	56.8	81	10.1	1.2
Equatorial Guinea	2004	0.51	10.5	2.07	61.9	12.21	72.4	14.2	5	1	N/A
	2006	0.52	10	1.99	96.9	19.26	106.9	20.55	8	1.2	0.2
Sao Tome & Principe	2004	0.15	7	4.61	7.7	5.06	14.7	9.8	20	1.5	N/A
	2006	0.16	7.6	4.74	18.4	11.51	26	16.2	29	2.2	N/A
Chad	2004	8.85	13	0.15	123	1.39	136	1.5	35	2.5	N/A
	2006	10.03	13	0.13	466.1	4.65	479.1	4.7	60	2.5	N/A
<b>Total Central Africa</b>	2004	97.81	230.6	0.23	4747.9	4.85	4978.5	5.08	452.5	44.8	
	2006	104.08	264.5	0.25	9640.5	9.26	9905	9.5	871	69.3	

Countries and Regions	Years	Population (millions)	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		Total in Mbps of International Bandwidth
			Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Suscribers(x000)	
Algeria	2004	32.36	2487	7.68	4882.4	15.09	7369.4	22.77	1500	60	36
	2006	33.35	2841.3	8.52	20998	62.95	23839.3	71.4	2460	1000	170
Egypt	2004	70	9464.1	13.52	7643.1	10.92	17107.2	24.4	3900	1300	29.3
	2006	75.44	10807.7	14.33	18001.1	23.86	28808.8	38.1	6000	1666.7	205.7
Libya	2004	5.66	750	13.56	127	2.3	877	15.4	205	205	N/A
	2006	5.97	483	8.09	3927.6	65.81	4410.6	73.8	232	82.5	N/A
Mauritania	2004	2.98	39	1.31	522.4	17.53	561.4	18.8	14	2	N/A
	2006	3.16	34.9	1.1	1060.1	33.57	1095	34.65	30	4	1
Tunisia	2004	9.98	1203.5	12.06	3735.7	37.43	4939.2	49.4	835	121	2.8
	2006	10.21	1268.5	12.42	7339	71.88	8607.5	84.3	1294.9	179.4	43.8
RASD*	2004	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2006	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Morocco	2004	29.89	1308.6	4.38	9336.9	31.24	10645.5	35.6	3500	113.2	64.7
	2006	30.73	1266.1	4.12	16004.7	52.07	17270.8	56.2	6100	399.7	391.9
<b>Total North Africa and Morocco</b>	2004	151.17	15252.2	10	26247.5	17.36	41499.7	27.45	9954	1801.2	
	2006	159.26	16701.5	10.4	67330.5	42.27	84032	52.7	16116.9	3332.3	

African Regions and Continent	Years	Population (millions)	Main Fixed Lines		Mobile Subscribers		Fixe+Mobile		Internet		
			Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Total (x000)	Per 100 Inhabts	Users(x000)	Subscribers (x000)	User/100 Inhats
Southern Africa	2004	122.62	5861.8	4.99	24549.3	20.02	30411.1	24.79	5090.1	3777.7	
	2006	128.29	5798.8	4.59	49133.2	38.9	54932	43.49	9771.8	4430.5	7.6
North Africa	2004	151.17	15252.2	10	26247.5	17.36	41499.7	27.45	9954	1801.2	
	2006	159.26	16701.5	10.4	67330.5	42.27	84032	52.7	16116.9	3332.3	10.1
East Africa	2004	246.74	2654.9	1.07	8493.5	3.44	11148.4	4.5	3381.9	554.3	
	2006	264.63	2612.4	0.98	23511.3	8.8	26123.7	9.8	8283.6	1306.7	3.1
Central Africa	2004	97.81	230.6	0.23	4747.9	4.85	4978.5	5.08	452.5	44.8	
	2006	104.08	264.5	0.25	9640.5	9.26	9905	9.5	871	69.3	0.83
West Africa	2004	244.8	2338.9	0.95	15850.4	6.47	18189.3	7.4	3417.9	209.4	
	2006	265.77	3130.5	1.17	55379	20.83	58509.5	22	10513.9	2168.7	3.9
African Continent	2004	863.14	26338.4	3.05	79888.6	9.25	106227	12.3	22296.4	6387.4	
	2006	922.03	28507.7	3.09	204994.5	22.23	233502.2	25.32	45557.2	11307.5	4.8

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