



Economic Commission for Africa

# Policies and Plans on the Information Society: Status and Impact

October 2003





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## Foreword

This volume, “*Policies and Plans on the Information Society: Status and Impact*” is the first in a series of publications that document the development and formulation of national e-strategies under the framework of the Africa Information Society Initiative (AISI). Launched in 1996, AISI is the first Information Society regional framework of its kind and has been instrumental in pioneering major information and communication technology (ICT) initiatives on the continent.

The development of national e-policies is AISI’s approach to policy-making. It is also the hallmark of ECA’s ICT for development (ICT4D) work. In the context of AISI, e-policies are also known as National Information and Communication Infrastructure (NICI) plans, and are being implemented in various countries, including Burkina Faso, Cameroon, Cape Verde and Rwanda.

According to the data analysed in this study about various stages of e-readiness, there are common challenges that African countries face. Among the major challenges is the need for political will and vision, balanced with the right mix of technical and managerial competence. This balance is necessary for ensuring that policies and plans assist countries to define an ICT for development agenda and to undertake effective implementation. Furthermore, the sustainability of policies and plans is driven by an internal set of dynamics that includes open and transparent processes and inclusion of civil society and other stakeholders at all stages of policy development including design, conceptualization and implementation.

This study provides clear evidence that strategies for building information societies are being given some priority in many African countries. ECA, which launched AISI together with the Partnership for Information and Communication Technologies for Africa (PICTA), has been able to support the formulation of national policies directly and indirectly in approximately 25 countries. Plans are underway to work in more countries.

ECA is confident that formulation and implementation of these strategies can assist in achieving the Millennium Development Goals (MDGs) of reducing poverty, raising levels of education, improving standards of health and health-care delivery, enhancing empowerment and reversing the loss of environmental resources. Such poverty reduction strategies should result in increased employment opportunities for millions of citizens and generally promote socio-economic development in Africa.

Executive Secretary

**K.Y. Amoako**

October 2003



*“... The most precious things to a people are their knowledge, their level of education and their ability to understand and use the scientific and technological progress that Mankind is making. These things are an essential condition for development. For this reason they were from the beginning, and will be in the future, a central objective in the construction of our Mozambican nation, of a country of educated people, and a modern State, respected and developed...”*

*President Joaquim Alberto Chissano, of Mozambique at the ICT policy implementation symposium, October 2001*

## Introduction

Advances in information and communication technologies (ICTs) over the last decade have brought a dramatic improvement and opportunities that have advanced Africa's participation in the information age. In fact, ICTs have created alternatives never imagined before for knowledge-based socio-economic development. Access to the Internet has already empowered business people, civil servants, academics and average citizens to communicate, share information and transact with colleagues, business partners across the globe.

The last ten years have seen a dramatic improvement in Africa's ICT sector. The wave of economic liberalization spurred private sector participation in the delivery of valued added services. Internet users have within a decade, surpassed 5 million users. In less than ten years, the number of Internet hosts increased from a mere 28,000 to over 280,000 in 2001. Mobile services that have enjoyed efficient regulatory frameworks have outpaced the fixed plain old telephones. African Internet content is also growing rapidly.

However, the fruits of the information society are still limited to the urban elite and international organizations that can afford expensive equipment and connectivity fees. Africa is home to 12% of the world's population and accounts for only one percent of global Internet users. Despite efforts to democratize access to rural areas through universal access strategies such telecentres, the results have not been significant or effective. Clearly, Africa has a long way to go to harness ICTs for poverty reduction.

Systematic approaches to policymaking remain one of the major steps towards harnessing ICT

### **Box 1.** **ECA and ICTs Development in Africa**

The Economic Commission for Africa (ECA) has been working for more than 25 years in promoting information and communication technologies in Africa. Its information and development programme came into existence in 1979 with the Pan African Development Information System (PADIS). The PADIS concept involved the establishment of a centralized development information database at ECA in Addis Ababa with national development information databases at national participating centres in African countries. This was on the assumption that more accessible information would mean better planning for African states and institutions. By the end of a decade, 41 countries and 49 subregional and regional institutions had joined the network. In 1995, PADIS was absorbed into the subprogramme on Harnessing Information Technology for Development as a result of the restructuring of ECA.

Looking for ways to exchange information more easily on the African continent, ECA undertook a series of computer networking pilot projects beginning in 1989-1990. The early projects, using Fidonet store-and-forward technology, concentrated on how to set up working electronic communication systems despite the limitations of African telecommunications systems. In 1992, ECA initiated the Capacity Building for Electronic Communication in Africa (CABECA) project, which resulted in the establishment of electronic communication nodes in 24 African countries. Following the CABECA project, ECA implemented other electronic networking projects in the region funded by the Government of the Netherlands and the United States Agency for International Development.

ECA's work has been transformed with the conception and adoption of the African Information Society Initiative (AISII) in 1996. AISII, calls for among others, development of National Information and Communications Infrastructure (NICI) in Africa.

for development. A number of countries have already embarked on developing national information and communication strategies. This paper reviews the progress and advances made in the formulation of national ICT strategies; development of sectoral policies; and the gaps in ICT capacities in Africa based on the work carried out by the United Nations Economic Commission for Africa (ECA). It also highlights the key challenges facing the promotion of ICT for African development in the next decade.

*“... This process of transforming our nation into information-rich, knowledge-based economy and society, was a difficult but appropriate choice...”*

*President Paul Kagame, at the Official Launching of the ICT- Led Integrated Socio-Economic Development Policy and Plan for Rwanda, January 2002.*

## **I. What is NICI?**

The concept of NICI policies and plans was adopted by AISI to emphasize the importance of the communication component of such plans. However, the concept is very close to that of national information infrastructure (NII).

However, NICI includes more than just the physical infrastructure and the equipment used to host, process, transmit or display data, text, voice and images. It relates to regulations, enabling environment and procedures that may lead to development of NICI activities. NICI also encompasses development of human resources in the public private and civil society sectors engaged in building infrastructure; creating applications and value-added services, carrying out training programmes, and training users; acquiring and selling equipment as well as providing Internet and other ICT services. Further, the developers, administrators, users and the population at large are an integral part of the NICI process and should be involved in its development from the beginning.

NICI plans and strategies need to reflect development priorities and sectoral plans. They also must support introduction of new regulatory frameworks that improve efficiency, and mobilize resources.

The elaboration of Information and Technology (IT) policy, an integral part of NICI development activities, is a major determinant factor in setting-up the underlying supporting infrastructure and enhancing optimal use of the technology. Development of an IT policy is an important exercise and should receive the support of all citizens and institutions in a country. Once established, the policy should aim at sustaining the country's vision and goals. It should embrace strategies and action programmes that ensure the building of information, knowledge, and decision-support systems.

NICI frameworks provide the basis for integrating ICT strategies into national and sectoral development plans which facilitate the achievement of national and sectoral development priorities and goals.

In summary NICI is:

- An instrument to implement the global AISI visions of developing the information infrastructure, human resources and content at national level;
- An African response to facilitate the digital inclusion of Africa and integration of the continent into the globalization process; and
- An exercise aiming at developing national ICT policies, strategies and plans which serve as roadmap for the countries participation in the knowledge economy.

NICI development process aims at improving the nations’:

- Information and communication infrastructure;
- ICT policies and regulatory frameworks;
- Human resources; and
- Infostructure.

NICI has three components:

- The policy;
- The framework; and
- Implementation plan.

## **Background to development of National ICT Strategies**

The stage of development in national ICT strategies in Africa is the culmination of efforts undertaken by many countries since the 1980s. South Korea was one of the first East Asian countries to prepare a National Computer Policy in the early 1980s. In 1982, a National Technology Promotion Congress was established with the President as the chairman, and incorporating cabinet-level Government officers and leaders from business, industry and research institutions. In 1980, Taiwan published its first National Computer Policy entitled “The 10-year Plan for the Information Industry of Taiwan”. The plan set out specific performance goals to be accomplished by Taiwan within a 10-year period. The plan addressed several issues including what the Government must do in order for Taiwan to become a world player in the computer and information industry. Government actions during this period included acquisition and implementation of information systems for Government departments, ministries, provision of tax incentives for the Information Industry, creation of low-cost data communications services and planning for the Information future.

Singapore was another country that developed its policies in the 1980s. It established the National Computer Board in 1981. The first statutory function was computerization of the Government’s administrative machinery and operations. The second function was co-ordination of computer education and training. The third function was development and promotion of a Computer Services Industry. Singapore since then has witnessed one of the fastest economic and industrial growth-rate. In Africa, Mauritius adopted the approach of Singapore.

India has also benefited immensely from its forward-looking policies in the area of ICT research and education. The first class at the Indian Institute of Technology was set up with assistance from the Massachusetts Institute of Technology (MIT) in the USA and has been turning out world-class engineers and scientists. Several leading US firms in the IT Industry now recruit from India and have set up subsidiaries there to develop software. Indian software exports to the USA are expected to exceed ten billion dollars annually.

Highly articulated ICT policies were developed in the 1990s, inspired by the USA’s announcement of development of a national information infrastructure plan with key focus on private investment, competition, access and universal services. The USA was also at the forefront of advancing the idea of Global Information Infrastructure at the time. A number of information-society initiatives in Canada, Japan, Australia, and European Union countries followed this national information infrastructure movement.

Developing countries that followed suit used two different approaches in defining their national ICT strategies. Some focused on developing ICT as an economic sector - either to boost exports (as in the

## BOX 2

### Historical Background to National Information and Communication Infrastructure

- Former US Vice President Albert Gore's National Information Infrastructure (NII) project announced in 1992 and started in 1993 sparked world-wide activities on development and use of ICTs. Most of the funding of Al Gore's project came from the private sector while the American Administration put in place the necessary mechanisms to enable proper planning and implementation, including creation of the Information Infrastructure Task Force (IITF). IITF "provided leadership in integrating into systems that support Government's operation". This task force was responsible for articulating and implementing the President's vision for advanced telecommunications and computing technology, and was "uniquely positioned to help develop the Governmental aspects of America's information infrastructure". Several committees and working groups were also established by IITF, and participants were drawn from state and local Government representatives as well as the private sector. In addition, a high-level Advisory Council on the National Information Infrastructure has been established by the former Vice President to provide advice to the IITF.
- At almost the same time, in 1993, the Japanese Government created the Telecommunication Council to define a national strategy that was enacted in 1994 and which gave priority to development of a fibre optic backbone around Japan. The aim was to enable information highway access to all Japanese households by the year 2010.
- In Europe, the Bangemann Report on the Global information Society was adopted by the European Commission in June 1994 and selected 10 projects for immediate financing. Eight months later, in February 1995, the G7 Group of countries held a special ministerial meeting on Information Highways in Brussels.
- In Canada, the Government developed through its "Information Highway" Project, a national policy aimed at generalising usage of ICT in every part of life anywhere in the country. Indeed, the objectives of the policy were to achieve universal access to the "Information Highway" in all public places, such as educational services, community networks, libraries and information banks; and to give free email addresses to any user who would like to have one. The Policy recognized that "some form of subsidization will likely be required to assure affordable access to the information highway" and that "this was necessary because telecommunications had become a principal engine of economic and social activity".

*Source: United States National Information Infrastructure, Recommendations to the European Council<sup>1</sup>; Competition and Culture on Canada's Information Highway<sup>2</sup>; Managing the Realities of Transition<sup>3</sup>*

case of Costa Rica and Taiwan or to build domestic capacity as in the case of Brazil, India and Korea. These countries strengthened the market orientation of their economic policies and institutions, have gradually dismantled barriers to trade and investment, and facilitated rapid changes in production and telecommunications technologies. Above all, these countries made concerted efforts to educate their people to keep them on track of global developments.

Others pursued strategies that promoted ICT as an enabler of a wider socio-economic development process. Some focused primarily on repositioning the country's economy to secure competitive advantage in the global economy. Malaysia, Mauritius, Tunisia, Trinidad and Tobago are some of the countries that focused primarily on repositioning their economies for securing competitive advantages. The bulk of African countries such as Egypt, Mozambique, Senegal, South Africa and Rwanda focused on ICT in pursuit of their national development goals. Many of the efforts to develop national ICT policy in Africa concentrate on advancing strategies that harness ICT for development.

National strategies in Africa were undertaken within the framework of The African Information Society Initiative (AISII). AISII emerged from recommendations of the Conference of African Ministers of Economic Development and Planning in 1996. Over half of the African countries have strived to develop their national information and communications infrastructure (NICI) plans, strategies and policies that articulate long-term policy, infrastructure, content and application as an integral part of overall national development.

1 [http://nii.nist.gov/Recommendations to the European Council](http://nii.nist.gov/Recommendations%20to%20the%20European%20Council)

2 <http://www.ispo.cec.be/infosoc/backg/bangeman.html> Competition and Culture on Canada's Information Highway

3 <http://www.crtc.gc.ca/> Managing the Realities of Transition

## II. Progress made in African Countries

The efforts of the African Information Society Initiative (AISI) and those by countries and development aid agencies have led to establishment of national ICT strategies in many African countries. Countries can be divided into three categories as they relate to ICT policies and strategies.

The top category involves those that have advanced their national strategies from conceptualization to implementation. These include Egypt, Mauritius, Morocco, South Africa and Tunisia. Some of these countries are advancing a two-tier approach - developing national strategies and harnessing ICT applications in key sectors such as education and commerce. They begun developing electronic commerce strategies and building clusters to attract foreign direct investment, to stimulate the knowledge-based economy, to create jobs for the youth and to harness the potential of ICTs. Other countries that have joined this group include Benin, Burkina Faso, Burundi, Cape Verde, Cameroon, Cote d'Ivoire, Ethiopia, Guinea, Mozambique, Namibia, Rwanda, Senegal and Tanzania.

The second category of counties includes those in the process of conceptualizing ICT strategies with projects to test the effectiveness of ICT for development. These include the Central African Republic, The Gambia, Ghana, Malawi, Mali, Niger, Nigeria, and Uganda.

The last category of countries comprise those with minimum activities in developing broad-based ICT strategies. The following section provides specific examples of the progress in various African countries.

### A. Benin

Benin's ICT strategy framework began in 1999 under the coordination of ECA and the International Development Research Centre (IDRC). A NICI Team was set up to work with all the stakeholders

#### Box 3

##### Genesis of the African Information Society Initiative (AISI)

In 1995, ECA co-organized a Regional Symposium on Access to Telematics with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Telecommunications Union (ITU), the International Development and Research Centre (IDRC) and Bellanet International. With some 450 participants from all over Africa and from the rest of the world, the event was a watershed in publicizing African readiness to move ahead in using ICT for development. Less than a month, the 1995 ECA Conference of Ministers of Planning and Development passed a resolution entitled "Towards an African Information Highway" calling on the ECA Executive Secretary to appoint a high-level group of African ICT experts to draft an action plan that would start Africa on the path of information infrastructure development. The experts worked for nearly a year to draft the plan, which the following year's Conference of Ministers adopted as the African Information Society Initiative (AISI). AISI is an action framework to build Africa's information and communication infrastructure. Its basic aim is to set out a framework by which Africa can end its information and information technology gap and enter the information age. Following its adoption, AISI has been the cornerstone of ECA's work to promote IT as a means to accelerate African development.

##### Revision of the AISI through the African Development Forum (ADF'99)

ECA convened the first African Development Forum (ADF 1) from 24-28 October 1999 under the theme "The Challenge to Africa of Globalization and the Information Age". It marked the beginning of a process led by ECA to position an African-driven development agenda reflecting a consensus among major partners and leading to specific programmes for implementation at national, subregional and regional levels. ADF was born out of the conviction that Africa cannot achieve sustainable development unless Africans themselves design and own their development policies, strategies and actions. The issue of Globalization and the Information Age was chosen for the inaugural ADF because of the importance of defining African-owned and African-led strategies for joining the global information economy. ADF'99 reviewed progress made in implementation of AISI and recommended strategies aimed at accelerating Africa's development with focus on ICT in education, health, business and creation of enabling policy and regulatory frameworks.

Source: Economic Commission for Africa <http://www.ECA.org/aisi/>

(Government, civil society, private sector, professional organizations, research and training institutions). A draft document on ICT strategies was prepared. This secured the consensus of the various stakeholders on the needs, priorities and actions to take for the full participation of Benin in the information and knowledge society. Benin's national plan entitled "Plan de developpement de l'infrastructure d'information et de communication du Benin: 2000-2004"<sup>4</sup> was approved and published in 2000. It focused on six major areas:

- Business and trade;
- Culture and tourism;
- Training;
- Health;
- Environment; and
- Good governance.

The Government of Benin has begun to implement pilot projects in these priority areas by mobilizing the private sector and the civil society. A new Ministry, the Ministry of Communications and Promotion of New Technologies, was established to coordinate the ICT activities in the country. In August 2002, the Ministry published «Bénin 2025: une société de l'information solidaire, épanouie et ouverte». The document envisions an open and interdependent information society in Benin by the year 2025.

In June 2003, the Government set up an independent agency to coordinate implementation of ICT activities in the country.

## **B. Burkina Faso**

Burkina Faso's "Plan de Developpement de l'Infrastructure d'Information et de Communication du Burkina Faso: 2000-2004" was developed by a NICI Team under the coordination of the following institutions:

- Ministry of Finance and Economic Development;
- Ministry of Communication and Culture; and
- General Directorate of Informatics.

The main goal of the Burkina NICI plan<sup>5</sup> was to promote convergence of the national policies on telecommunication, informatics, the media and broadcasting. Strategic objectives of the plan are:

- Make the country feel less landlocked;
- Promote good governance;
- Encourage sustainable development of human resources;
- Develop new resources and jobs; and
- Improve governance and national image.

The priority actions identified five critical areas:

- Development of the telecommunication infrastructure;
- Modernizing the civil service;

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<sup>4</sup> Available at: <http://www.ECA.org/aisi/nici/>

<sup>5</sup> Available at: <http://www.ECA.org/aisi/nici/>

- Support to research and education;
- Development of community information centres; and
- Trade facilitation.

These fall under three cross-cutting themes:

- Technological choices;
- Training; and
- Organizing and regulating the ICT sector.

The plan was approved in October 2000 and implementation began with the participation of stakeholders and with support from the international development partners and funding agencies. Several interministerial follow up committees have been established for monitoring implementation of the NICI plan in Burkina Faso.

### C. Cape Verde

The national ICT strategy in Cape Verde is being coordinated by the Ministry for Infrastructure (MIH). The ECA and IDRC provided technical assistance. A National Team of Experts prepared the Plan<sup>6</sup>, which was finalized in October 2000. The National Team was composed of experts from the following institutions:

- Minister of Infrastructure;
- Minister of Planning;
- Ministry of Education;
- Cabo Verde Telecom; and
- National Statistics Institute.

During the NICI development process, the Team found out that ICTs applications had been implemented in various sectors of the country. However, in most areas, the usage was at the basic level, except in the teaching institutes and in companies dealing with international partners such as newscasters, air transportation, banking, telecommunications, fuels and energy.

It was learnt that the telecommunications infrastructure in the country was in good condition both in terms of quality and national coverage. However, it was noticed that the capabilities of this infrastructure were far from being fully utilized with applications using ICTs. Most applications implemented by institutions were based on single-user systems or isolated local-area networks. Internet solutions were very scarce.

The plan covered the following areas:

- Education;
- Health;
- Central and regional administration;
- Fight against poverty;
- Regulation;
- Environment protection;
- Public safety and civil protection;
- Communication infrastructure; and
- Universal service.

<sup>6</sup> Available at: <http://www.ECA.org/aisi/nici/>

The Government has taken measures to implement the plan in a number of areas since publication of the plan.

#### **D. Cameroon**

The NICI Plan development process in Cameroon was initiated by ECA and supported by UNDP. It was led by a team of national experts who developed an integrated national ICT strategy for a period of one year. The team worked with representatives from Government, civil society, private sector, professional organizations, and research and training institutions.

The NICI Team analyzed the following three priority issues:

- Policy and regulatory environment;
- Tools and technology; and
- Applications, services and networks.

For each of the above strategic issues, the NICI plan<sup>7</sup> addressed the following:

- Identification of priority actions, the concerned sectors, the targets and the relevant projects;
- Proposition of a short-term, medium-term, and long-term action plan for each activity and project;
- Proposition of an implementation strategy; and
- Definition of the role of each stakeholder;
- Identification of partnerships; and
- Proposition of a collaborative implementation framework for each sector

The strategy identified several projects for implementation in the following priority sectors:

- Business and trade;
- Health;
- Education and research;
- Food security;
- Tourism;
- Culture;
- Disaster management;
- Employment;
- Environment protection; and
- Good governance.

Although the NICI Plan is not yet officially validated, development process has created a lot of enthusiasm and sensitized policy-makers on the need to have a more systematic approach to ICT issues. It is in this context that the Government has announced the creation of a High Authority in charge of ICT issues in Cameroon. In July 2003, ECA received a request from the Government of Cameroon to move the NICI development process forward.

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<sup>7</sup> Available at: <http://www.ECA.org/aisi/nici/>

## E. Cote d'Ivoire

The NICI Plan development process in Cote d'Ivoire started at the end of 1999 and was led by the Office of the President. A Team of 40 national experts was appointed from the various sectors of the economy to liaise with all the stakeholders (Government, civil society, private sector, professional organizations, research and training institutions, etc.) to develop an integrated and comprehensive national strategy.

The NICI Team was supported by the National Council for the Information Highways – conseil national des autoroutes de l'information - The final document<sup>8</sup> was developed by a small team of five experts mandated by the National Team of Experts.

The priority actions identified by the NICI Plan include:

- Agriculture and natural resources;
- Culture;
- Education, training and research;
- Good governance;
- Private sector;
- Health;
- Women in development;
- Tourism; and
- Media.

Following adoption of the NICI plan by the Council of Ministers in July 2000, a national coordination and monitoring mechanism was set up with focal points at Government, private sector and civil society levels.

Some of the top priority projects identified in the NICI plan are:

- Connecting the various Ivorian cities using up-to-date technology;
- Starting a Government Intranet;
- Connecting universities and high schools;
- Content development; and
- Developing an African Regional ICT hub.

Conscious of the challenges of ICTs for development, the new Government of Cote d'Ivoire has created a Ministry of Communication and Information Technologies to implement the NICI Plan and the priority projects that were identified.

## F. Egypt

Egypt is the leading country in North Africa in the use of information technologies for governance. The Information Decision Support Centre established in 1985 was instrumental in establishing electronic Government as far back as 1990. Egypt launched its National Information Highway programme to support and energize its socio-economic development as early as 1994. Egypt was also one of the countries that recognized the need for highly skilled human resources development as early as 1992. The Regional Information Technology and Software Engineering Centre (RITSEC) was established in 1992 to support and develop the information communication technology industry and infrastructure in Egypt.

Establishment of the Ministry for Telecommunications and Information in 1999 provided further

<sup>8</sup> Available at: <http://www.ECA.org/aisi/nici/>

impetus towards development of broad-based information society plans and programmes. Among the key programmes that were launched by the Ministry was the national plan for information and telecommunications development based on studies conducted by international consulting houses and business consortiums affiliated with the telecommunications and information sector.

Egypt has since embarked on a number of projects that aim to improve the ICT industry advance universal access to information and communication, and create jobs. Among the key projects of the national telecommunication plans are:

- An e-Government programme that aims to improve the effectiveness and efficiency of ministries and public institutions;
- Establishment of free zones and ICT parks;
- Incentives to private sector particularly in software development, export and creation of an enabling policy environment for the telecommunications and Internet services industry;
- Youth and community development programmes;
- Comprehensive human resource development strategies targeting research and young people;
- Information society awareness programmes for the public;
- Increasing number of public access centres; and
- Reduction of cost of access to information and communication services.

## G. Ethiopia

Although Ethiopia has been active in developing a national ICT policy for sometime, it has remained one of the slowest in terms of translating policy efforts into concrete actions. The Government has recognized ICT as one of the key sectors of development. A national ICT policy task-force was set up by the Prime Minister to draft a policy document. The policy document has recently been adopted by the Council of Ministers.

Amid frustration with the slow progress, the British Council, in collaboration with ECA and UNDP, held a successful stakeholders conference in June 2001 with the aim of developing an ICT vision for Ethiopia, sharing examples of best practice and taking practical steps towards implementation of successful partnership projects. The recommendations emphasized the need for considering ICT as a key sector in development, access to information and knowledge for all as a national priority, and Ethiopia needs to use ICTs to develop its economy. The conference resolved that:

- An enabling legal and regulatory environment should be established to encourage innovation and use of ICTs;
- A universal access strategy should be established;
- Incentives should be put in place to encourage applications development for and in the local market;
- The Government should initiate a programme to take advantage of opportunities for electronic government;
- All tertiary education institutions should be connected to the Internet by 2003;
- Schoolnet Ethiopia should be introduced in collaboration with the private sector and development agencies, and
- A national ICT human resources development fund should be established.

The first cycle of implementation plan covering the period 2003-2008 was prepared and a national ICT Coordination Office is being established to manage implementation, monitoring and evaluation

process. The Government has recently embarked on a number of IT projects focusing on improving public administration, revitalizing education and enhancing the infrastructure. In July 2003, the House of Peoples' Representatives unanimously endorsed a bill providing for the establishment of the Ethiopian Information and Communication Technology Development Authority with a view to guiding the synergetic and systematic use of ICTs for accelerated political, social and economic development.

## **H. Ghana**

Ghana is well positioned to join the list of countries that are developing a sound Information Society policy. Ghana has made considerable progress in creating an enabling environment and a good investment climate for key industries, including the information and communications sector.

It has a strong entrepreneurial infrastructure including a stock exchange. There are over 100 computer-related companies that specialize in computer hardware supply, maintenance, software and sales and support. Further, it has Internet services, 12 licensed and three operational Internet Service Providers (ISPs), Africa's only 10mbs wireless data and voice technology; a national energy company fibre network looping that covers half of the country, three wireless technology companies, and a longstanding liberalized telecommunications sector. Ghana is very attractive to multinational and national private sector investment. The plan to establish a landing station for the undersea Africa-One fibre cable from South Africa to Portugal that is scheduled for 2002, positions Ghana to benefit from dramatically reduced bandwidth costs, and to become a regional access provider for West Africa.

The work on developing a national ICT strategy in Ghana began at the end of 1999 with the support of ECA and IDRC and was revived in 2002. A NICI Framework document was launched in January 2003 and the Policy Document was submitted to the Government in July 2003. The NICI Plan should be completed by December 2003, followed by the formulation of a mid-to-long-term strategy for ICT development.

## **I. Kenya**

Despite advances in private sector initiatives, the Government of Kenya has been reluctant to embrace ICTs for social and economic development. However, the interest in harnessing ICT for development in Kenya is gaining ground. The new Government recently declared that ICT is a key area of social and economic development and should be integrated in its Poverty Reduction Strategy Paper (PRSP). It has established a national taskforce headed by the Permanent Secretary of Ministry of Transport and Communications and a strong team of experts working on key areas such as governance, human resources development, and an enabling policy and regulatory environment.

The pressure for the integrated ICT-driven social and economic development of Kenya has come from the private sector and a pressure group known as the Kenyan Information Society (KIS). KIS whose secretariat is based at the British Council is working with all stakeholders on both the supply side – telecommunications, Internet -and the demand side - applications to health and education to create synergies. KIS is also working with the Government to create awareness of the Information Society evolution.

The pressure group has recently undertaken considerable lobbying efforts and has established a number of telecentres to facilitate realization of universal access to ICTs. KIS has annual ICT forums to promote networking between stakeholders on the Information Society and global knowledge. A recent one-day conference agreed that the time is ripe for Kenya to develop a comprehensive ICT policy based on consultation by a cross-section of society. It was noted that it is important to review the existing regulatory framework that has locked out many players from offering key services such as direct connectivity to the

Internet via satellites. The long-term vision of the Government and the pressure group is to encourage integration of information technologies in long-term planning processes, to enable Kenya to compete in the emerging economies of the information age.

The new Government has started re-engineering the NICI development process. Major partners have expressed interest in participating in the process. A local experts team was formed to draft the document on the national strategy and the NICI secretariat is in place and set up at the Ministry of Transport and Communications.

## **J. Lesotho**

The national information and communication strategy of Lesotho was inspired by its recent introduction of full Internet access. Lesotho has established a national Internet hub through a memorandum of understanding signed between the USAID - Leland Initiative and the Ministry of Trade and Industry. The hub now comprises a national backbone that provides services to Internet service providers and users both from the private sector and public institutions.

The Kingdom has also embarked on an electronic Government project that links public institutions for exchange of information. The process has opened up debate on development of broad-based ICT-led social and economic development programmes in Lesotho.

Consequently, a National Information and Communication Policy was prepared in 2002. The process has now moved to development of a NICI plan.

## **K. Malawi**

After a slow-down in policy formulation for two years, Malawi recently began a fresh initiative to develop an ICT policy under the leadership of the Director of the Government Public IT Services. It has established an ICT policy taskforce and a technical working group on information and communication technology policy.

UNDP and ECA are providing technical and financial assistance for ICT policy development. Following a needs assessment by a consultant, a national ICT policy document was developed and submitted to the Government in July 2003.

## **L. Mauritania**

Mauritania has benefited from the ADF'99 NICI development process coordinated by ECA and IDRC. The country embarked on a fast-track process that managed to deliver its NICI plan in time for ADF '99. The process which was led by the university, the researchers and the civil society, with the full support of the Government delivered in September 1999 its document entitled: "Plan de développement de l'infrastructure nationale d'information et de communication: 1999-2002"<sup>9</sup>.

The Plan identified the following four priority sectors each with a major national project that would incorporate the use of ICTs:

- Education: national network for learning and research;
- Health: national information and communication health system;

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<sup>9</sup> Available at: <http://www.ECA.org/aisi/nici/>

- Public administration: national government information and communication network; and
- Private sector: a trade information and exchange network.

Mauritania begun implementing the Plan in 1999. A ministerial-level coordination mechanism was created to monitor the progress. The Government has also created a Secretariat of State for Information Technology that revises and implements projects and programmes aimed at enhancing national development. The NICI plan is being updated to reflect new developments.

## **M. Mauritius**

Mauritius has a fairly advanced broad-based information policy compared to other African countries. Modeled around the Singapore ICT policy, the Mauritius strategy involved the following elements:

- Creating instruments for implementation of ICT policy (Ministry of Communication and Information Technology, the National Computer Board);
- Liberalizing the telecommunication sector;
- Creating an IT literate workforce;
- Improving the capacity of public institutions to harness ICTs; and
- Position Mauritius to be a key player in ICTs by creating an enabling environment and robust infrastructure.

Following the National IT strategic plan in 1998, Mauritius launched a number of projects in policy formulation, ICT awareness, human resources development, Government computerization and standard setting. Its Parliament passed an Electronic Transaction Act in July 2000 to provide the appropriate legal environment for electronic transactions covering electronic contracts and to establish Certification Authorities and standards to combat forgery and fraud in electronic business.

The National Computer Board (NCB) that coordinates ICT policy has intensified ICT programmes in areas such as electronic commerce strategy, information security guidelines, standards, electronic government and promotion of the culture through coaching, seminars and workshops. NCB has an ongoing project for collecting and analyzing baseline data to provide information on the ICT market in Mauritius. The National IT strategic plan (NITSP) of 1998 is currently being updated.

## **N. Morocco**

In North Africa, Morocco has made considerable progress towards building an information society. Morocco's national ICT plan was developed in 1999. It is being executed by the Secretariat d'état à la poste et aux technologies de l'information<sup>10</sup> (SEPTI), under the auspices of the Prime Minister. The plan addresses five key themes - education, governance, private sector development, e-commerce and access. These themes formed the basis for national IT strategy development and are now regarded as the e-Maroc plan. The ICT strategies aim at improving the productivity of Moroccan industry, modernizing the public sector administration, reinforcing government programmes aimed at eradicating poverty, raising levels of literacy, improving delivery of services in health, education and training and providing access to information in isolated rural communities.

An implementation strategy for the action plan was devised with emphasis on preparing the necessary legal environment, building consensus and partnership among the private and public sectors and civil

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<sup>10</sup> <http://www.septi.gov.ma>

society. There are also public awareness programmes on ICT for development that target parliamentarians and the media among other influential groups.

Morocco has begun reaping some tangible benefits from its active implementation of ICTs in such areas as the tourism industry. An increasing number of ISPs and cybercafés have created more access to information, knowledge and employment opportunities, especially for young people. This has strengthened the entrepreneurial spirit. By end of 2001, Morocco had over 2000 ISPs and cybercafés and a reasonable communications infrastructure of 1.6 million fixed and 4,000,000 mobile telephones. The number of websites reached 4,000 during 2001 and most significantly, the cost of a monthly Internet subscription dropped to about \$ US 6 per month.

The ICT growth has also caused pressure for revision of the curricula in engineering schools to give an emphasis to the IT sector. An academic and research network has been set up to connect 16 nodes countrywide covering all the universities and engineering schools. The Government also has plans to accelerate development of content at all levels, to extend access to rural areas and to complete liberalization of the telecommunications sector by the end of 2002.

## **O. Mozambique**

The ICT policy process in Mozambique is unique in its participatory approach and has attracted considerable attention within the region and internationally. Supported by IDRC and based on the AISI framework, Mozambique developed a draft ICT policy that was approved by the Council of Ministers in May, 2000 and validated in a series of national debates held all over the country between June and July 2000. The process was guided by an ICT Policy Commission, composed of Ministers or Deputy Ministers from key Ministries. An Executive Secretariat based in the Office of the Prime Minister provides technical support. The ICT policy of Mozambique aims to:

- Make Mozambique a relevant and competitive partner in the global information society;
- Contribute to the war against poverty and improve the quality of life in Mozambique;
- Guarantee citizen access to the benefits of the global information society;
- Improve governance and public administration;
- Raise the efficiency and efficacy of state institutions and the usefulness of their services; and
- Make Mozambique a producer and not a mere consumer of information and communication technologies.

It articulates economic, social and governance goals and identifies eleven priority areas in which ICT can be applied to accelerate development in Mozambique. These include education, human resources development, universal access, telecommunications infrastructure, governance, agriculture, natural resources, tourism, electronic commerce, health, women, youth and culture. In addition, it identifies a number of issues that will need to be addressed to support implementation. These include a national network of research institutions, a new approach to funding that takes the capacity of national budget into account and that identifies investment incentives for the private sector, the need to act in concert with regional and subregional organizations on such issues as infrastructure and tariffs and implementation of strategies tailored to Mozambican realities. Mozambique hosted an international conference on ICT policy implementation in October 2001 to secure resources from national and international institutions. A national strategy was developed and adopted in July 2002 and The Commission on ICT is implementing catalytic projects in a number of areas.

## **P. Namibia**

Namibia has enlisted international consultants to assist in ICT policy formulation and in developing the necessary infrastructure for the information society. Compared to many African countries, telecommunications and Internet infrastructure in Namibia is very well advanced.

The current policy document was commissioned by the Ministry of Information and Broadcasting. It covers human resources development, electronic commerce, enabling environment for the private sector, and e-government. The document was completed and submitted to the Parliament and other parties for discussion and validation. In June 2003, Namibia adopted the ICT Policy, and plans to finalize the NICI plan by December 2003.

## **Q. Nigeria**

Although it is dubbed by many as a potential powerhouse for the Information society and Internet growth in Africa, Nigeria has not been as active in embracing ICT for social and economic development as would have been expected. A NICI workshop supported by various international development partners, including ECA, brought together various stakeholders in Abuja, in March 2000. The main recommendations of the workshop were to set up an ICT coordination mechanism and to develop a NICI policy and plan. Consequently, the Nigerian Information and Communication Technology Agency (NICTA) was created under the umbrella of the Ministry of Science and Technology. NICTA has produced a document entitled “Nigerian National Policy for Information Technology (IT)” that was issued under the auspices of the Ministry of Science and Technology. The policy document contains 31 objectives including, the need for harnessing ICT for education, wealth creation, poverty eradication, job creation, and global competitiveness.

The key strategies outlined in the policy document include:

- Establishing a national fund for ICT;
- Setting up an ICT development agency;
- Harnessing ICT to improve Government operations;
- Empowering the public private sector and small and medium enterprises by creating an enabling environment;
- Harnessing ICT in the education and health sectors; and
- Setting up information technology parks.

The document has stirred up public debate on the key areas identified by the policy drafting committee. ECA is expected to revive and spearhead this process and assist Nigeria to put in place a comprehensive ICT policy and NICI Plan for implementation, at both the federal and Government level by August 2003.

## **R. Rwanda**

Rwanda has made progress in developing an all-encompassing ICT social and economic development framework. Supported by ECA and championed by President Paul Kagame, the ICT-led socio-economic development plan for Rwanda suggests bold steps that will help bring about the country's recovery from the scars of the war. The plan aims to build strong ICT infrastructure both in public and private institutions, create human resources capacity, create an enabling regulatory and policy framework, and invest in incentives that attract foreign direct investment.

The ICT policy and plan for Rwanda comprises eight pillars namely: human resources development; increasing ICT use in education; deploying ICT in the community; facilitating foreign direct investment; creating enabling legal and regulatory framework; improving the ICT infrastructure; enhancing public administration through ICTs; and developing the capacities of the private sector. The estimated cost of implementing the plan during the next five years is about US\$500 million. Rwanda has embarked on intensive mobilization of resources to implement the plan.

The Government of Rwanda has started implementing the NICI plan. To arrive at the policy implementation programme, the country has undergone an elaborate ICT policy framework development involving key stakeholders and high-level planners including the Cabinet. Rwanda has also established 2 key instruments to implement policy programmes: the National ICT Commission which is chaired by the Prime Minister and sets policy directions; and the Rwanda IT Agency which will coordinate implementation of ICT programmes.

## **S. Senegal**

Senegal's ICT policy development process has been very elaborate and has received international and local support. Senegal's advanced telecommunications infrastructure and entrepreneurship drive were the factors that contributed to effective policy formulation. In addition, Senegal built a robust telecommunications infrastructure, liberalized the sector and put in place the policy instruments necessary to facilitate an advanced information infrastructure. The policy process is being implemented by the information and communication technology secretariat lodged in the Office of the President. President Wade is very passionate about ICT for development and has inaugurated an ICT park in Dakar.

Senegal's ICT strategy involves creating an enabling environment to:

- Attract investment and innovation;
- Providing universal access to ICTs including young people;
- Harnessing ICTs in health and delivery of other public services;
- Enhancing the capacities of small and medium enterprises; and
- Content-creation; and building key instruments to advance information and knowledge.

The national strategy has greatly benefited from the IDRC Acacia Project. The key targets of the Acacia strategy for Senegal are:

- Building ICT infrastructure;
- Human resources development;
- Improving ICT integration in the health sector;
- Building the capacities of small-scale enterprises and telecentres;
- Mainstreaming gender in the national ICT strategy;
- Improving utilization and diffusion of ICTs by civil society organizations;
- Increasing the role of ICTs in the decentralization policy; and
- Creating a youth cyberspace experimental site and information resource centre.

Private sector actors and ICT professionals have also been active in spearheading implementation of ICT programmes through a plan known as "the ICT Grape". ICT Grape aims to harness ICTs to reduce unemployment and poverty, increase literacy and access to healthcare and improve competitiveness and efficiency in government and private sector institutions. ICT Grape also emphasizes ICTs in education, health-care delivery, electronic business, and teleservices.

The Office of the President has spearheaded implementation process and authorized the « ministère de la communication et des technologies de l'information » and the « cellule des nouvelles technologies de l'information et de la communication, Secrétariat Général de la Présidence de la République » to promote and coordinate ICT activities in the country.

## **T. Seychelles**

Seychelles has made considerable progress in modernizing its infrastructure and turning the country into a hub for investment and leisure. With fully privatized telecommunications and value-added services in Africa, cable and wireless is flourishing, providing high-tech telecommunications in Seychelles. In a move to strengthen and expand these services, the Government licensed a second operator - Seychelles Telecom, which is set up to provide further high-tech telecommunication facilities. Seychelles has two major ISPs with a total of 4Mbps expandable, GSM 900 Cellular System with international roaming in over 50 countries, ISDN services, Internet services, and local and international digital leased circuits. Twenty percent of the population is now connected to cell phones. The Ministry of Information Technology (MITC) is coordinating the information and communication technology strategy.

Seychelles is host to modern banking facilities including a well-developed electronic banking network, automated bank tellers, SWIFT and Direct Debit (EFTOPS) facilities. In addition to automating the public institutions, the Government has launched a major initiative to develop ICT-skills in the country as a whole. The national curriculum has been revised to integrate ICTs into the education systems.

## **U. South Africa**

South Africa has made considerable progress in ICT development on all fronts. The South Africa IT Strategy Project (SAITIS) was developed by the Department of Trade and Industry and the Department of Communication, in consultation with the private sector and other stakeholders. SAITIS has four fundamental objectives: to create a robust, growing and sustainable ICT sector; to increase the use of ICT as an enabler for socio-economic development; to create a knowledgeable and growing ICT workforce; to create a world-class culture of ICT innovation. Specific initiatives sponsored by SAITIS include: providing Internet access in schools; creating an academy for software development training; providing community Internet access points; and installing public information terminals for access to Government services.

South Africa has been able to extend its base of ICT usage with development of infrastructure and applications made available through Government community initiatives, as well as by the private sector. The country has the largest GSM market outside Europe and is ranked among the top 20 globally in terms of Internet users. The Government has also increased computerization of its own operations, and it has become the standard for every Government official to have access to a computer and to use email to communicate with other departments. However, access to ICTs is only available in primary and secondary towns and not in remote and rural areas.

ICT usage in education is improving in some instances but not all schools have the requisite infrastructure or access to computers. Even when they do, they fall into disrepair due to lack of maintenance and a shortage of IT-literate staff to use and maintain them.

South Africa has also launched a number of high-profile projects in ICT innovation. The Gauteng Provincial Government announced the set up of an innovation hub between Johannesburg and Pretoria with the active involvement of the Council for Scientific and Industrial Research (CSIR) and the

University of Pretoria. The project aims to encourage high-growth, innovation-led and knowledge-based businesses, stimulate and support technological entrepreneurship and provide access to regional knowledge. It has also established the Spatial Development Initiative (SDI) and installed infrastructure and high-bandwidth networks for demonstration and piloting of cutting-edge technologies. South Africa has also announced the Cape Information Technology Initiative (CITI) that intends to convert Cape Town into an IT intelligent city.

A development that has received recent global attention is the announcement by President Thabo Mbeki of the establishment of two high-profile task teams to assist the Government in closing the “digital divide”. Members include: Larry Ellison of Oracle, Carly Fiorina of Hewlett Packard, Esther Dyson of Edventure Holdings, Craig McCaw of Teledisc, Prof. Manuell Castell of the University of California – Berkeley, Serge Tchuruk of Alcatel, Rajendra Pawar of NIIT India, and David Potter of Psion. The group’s mandate is to advise local experts on expanding competitive use of ICT. South Africa recently established an e-Africa commission to promote the use of ICTs for social and economic development in Africa.

## **V. Swaziland**

The Kingdom of Swaziland, through its Government Computer Centre, has initiated various successful and ongoing ICT projects. The enabling environment has led to a flourishing ICT private sector. Swaziland has the largest number of ISPs per capita in Africa. The first national workshop on ICT policy was organized in November 2000 by UNDP, UNESCO, ECA and the Swaziland National Association of Journalists (SNAJ). Activities have been slow in the Kingdom since the meeting.

## **W. Tanzania**

Tanzania has recently made a considerable progress in information and communication policy formulation. In addition to assistance provided by the International Institute for Communications Development (IICD) and ECA in organizing workshops on ICT policy, Tanzania has taken steps to engender public-private partnership through a group known as e-Think Tank.

The e-Think Tank is an informal association of people interested in ICT for Tanzania’s development. The mission of the e-Think Tank is to offer ICT leadership by catalyzing policy changes and supporting related developments aimed at enabling Tanzanians to participate effectively in the modern Internet-based global economy. IICD organized an ICT policy workshop in September 2001 at which a draft ICT policy framework document was discussed. The consultative process resulted in the approval of the first Tanzanian National ICT Policy in March 2003. Development of implementation strategy is expected by the end of 2003.

## **X. Tunisia**

Tunisia has an advanced information and communications infrastructure and a good ICT research base. Tunisia’s approach to information society development has been to position ICTs as key drivers of the economy. Tunisia has state-of-the art technology parks of which El Ghazala was considered one of the Venture Capitals of the world by a Wired Magazine survey in July 2000. It has strong research centres and good universities equipped to teach and research cutting-edge ICTs. The Tunis Institute of Advanced Business Studies offers an MBA programme in information technology and electronic commerce.

In addition to a strong economy and excellent infrastructure, Tunisia’s long standing endorsement of ICTs helped to transform major sectors of the society such as education, healthcare (telemedicine), government

(paperless administration), commerce (electronic commerce), and manufacturing (electronic processes). Tunisia has also placed great emphasis on education. The country's annual budget generally allocates more than 20 percent of the operating budget for primary and secondary education, a figure that is among the highest in the world. Education in Tunisia is not only free and accessible to everyone it is compulsory between the ages of 6 and 16.

A large-scale effort is underway to connect businesses, education and research establishments to the Internet. The establishment of private ISPs, proliferation of "virtual souks", creation of an enabling environment for electronic commerce and establishment of telecentres and cyber cafes have been the driving forces for the success of information and knowledge programmes in Tunisia. Secondary schools, universities, research institutions and medical centres are already connected to the Internet. Tunisia is making considerable progress in connecting all primary schools to the Internet.

## **Y. Uganda**

Uganda has a favourable enabling policy and regulatory environment for ICT development. The recognition for ICT-led socio-economic development by the Government has led to an ongoing consultative process spearheaded by the Uganda National Council for Science and Technology. In 1997, the President requested preparation of strategies to enhance ICT development in an effort to facilitate private sector investment growth in Uganda. A national ICT taskforce was established in 1999 drawn from key stakeholders and disciplines. The taskforce has undertaken several consultative meetings and initiatives to solicit input into its draft policy document.

A high level dialogue was held in August 2000 to identify and harmonize institutional and sectoral issues. This was followed by a national ICT policy framework workshop held in September 2000 with support from ECA, IDRC and UNESCO. The workshop brought together stakeholders from government, parastatals, the private sector, research and development and training institutions. Discussions centred on the need for an institutional framework and the key policy issues that need to be addressed in order to develop a viable ICT environment. The meeting was followed by a consultative process that culminated in a draft ICT policy framework document. This document is the current basis for developing ICT policy and plans for Uganda. An ICT policy implementation plan is under development.

## **Z. Zambia**

In 2000, Zambia, under the leadership of the Ministry of Information and Broadcasting Services, and with support from ECA, engaged two local consultants to produce a draft ICT Policy Working Document for discussion at a consultative meeting that was held in March 2001. The document articulated the need for Zambia to emerge with a broad-based information society policy.

Among other needs, the document emphasizes the following:

- The need to develop physical infrastructure, universal access, and human resources;
- Development of the ICT sector and creation of jobs (harnessing of ICTs by Small and Medium Enterprises (SMEs) particularly e-commerce;
- Launching of electronic government;
- The promotion of e-commerce; and
- The promotion of applications in education, environment, livelihood and health.

The consultation workshop provided a number of key recommendations and action plans. A steering committee was charged with the responsibility of working with broad-based constituencies to move the

policy process forward. It was noted that Zambia should develop bold strategies for tapping into global resources and for integrating ICTs into its upcoming development plan. Long-term strategies that were suggested and these include:

- Setting up a Government Intranet within the framework of public sector reform;
- Establishing a comprehensive school networking project to cover primary, secondary and tertiary education, that integrated curriculum development, networking, building library content, and teacher education; and
- Arranging capacity building for regulators and the judiciary. This is crucial in order to meet the growing challenges of universal and rural access, pricing, interconnection, resources management, and issues such as intellectual property rights, digital signature and global negotiations.

**BOX 4**

The list below comprises a new group of countries which are either starting or revitalizing efforts to initiate policy formulation. ECA has received official requests for support from the following:

- Department of Science and Technology of Lesotho in March 2003;
- The Ministry of Transport and Communication of the Republic of Congo in April 2003;
- The Ministry of Infrastructure, Post, Telecommunications and International Transport of Comoros in July 2003;
- The Ministry of Development and Economic Planning of Sierra Leone in July 2003; and
- The Ministry of Technology and Communication of The Gambia in July 2003.

As some of the countries already started the baseline studies as part of the preparation, it is expected that these countries will soon join the above group.

The suggested areas of action include ICT research, development of centres of excellence and building the capacity of universities in Zambia. The country intends to embark on an electronic commerce policy and will launch catalytic projects in key areas identified during the consultative workshops. The new Government has started to revive the NICI development process. It is expected that the plan will be completed by December 2003.

### III. NICI Case Studies

#### A. Case study 1: NICI Plan of Rwanda<sup>11</sup>

##### 1. Background

The Rwandan ICT-led socio-economic development policy and plan development Process supported by ECA began in November 1998. The process was piloted by the Office of the President of Rwanda<sup>12</sup>.

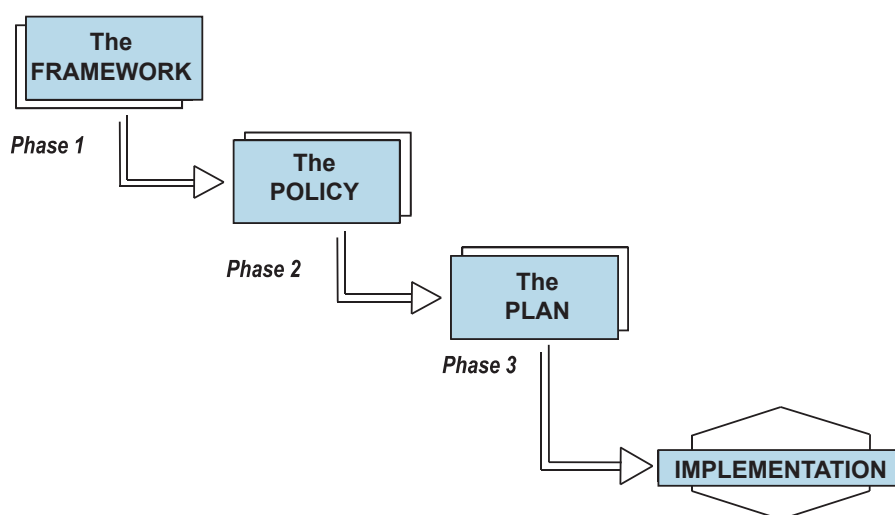
The vision of the Rwanda NICI plan is to modernize the Rwandan economy and society using information and communication technologies (ICTs) as an engine for accelerated development and economic growth, national prosperity and global competitiveness.

The process yielded four main outputs namely: the Framework, Policy, Plan and Structures. The Framework set the agenda for guiding development of other elements of the process. The Policy based on the Framework provided details of the policy commitments of Government in relation to what needs to be done to realize the country's social and economic development aspirations through the deployment, exploitation and development of ICTs. The corresponding Plan provided details of how the policy commitments can be translated into concrete programmes and initiatives for implementation. The Structures, or institutional set-ups, serve a national coordination purpose, to support implementation of the policies and plans.

##### 2. Process and Phases

The first phase of the process was devoted to development of the Framework; the second phase developed the Policy; and the third phase was devoted to development of the Plan based on the details of the policy. The process as illustrated below is now in implementation stage.

Figure 1. Rwanda NICI Process



<sup>11</sup> This case study is based on the NICI Plan of Rwanda, available at: <http://www.ECA.org/aisi>

<sup>12</sup> The process was led by ECA's lead Consultant, Professor Clement Dzidonou, Chief Executive Officer, International Institute for Information Technology (INIIT), Accra, Ghana and member of the various Technical Advisory Committees of ECA's African Development Forum (ADF).

A number of structures for supporting policy and plan development and implementation process were identified during the first phase and documented in the framework document. The key ones are the National Information Technology Commission (NITC), the Rwanda Information Technology Authority (RITA) and the Plan Execution and Coordination Committees (PECCs). These implementation structures will be set-up in the various agencies, such as the Government Ministries, and other public sector organizations (PSOs).

### 3. Framework Development Phase

The Framework entitled 'An Integrated Framework for Socio-economic and ICT Policy and Plan Implementation for Rwanda' identified specific policy issues and orientations that are required to guide the policy development process and the related strategic plans. Some of the key subject areas and topics in the document included:

- An analysis of the current socio-economic situation of Rwanda;
- Identification of the key socio-economic developmental challenges facing the Rwanda;
- A review of efforts made in the past to address the identified developmental challenges;
- A review and analysis of national socio-economic development policies, programmes and long-term development frameworks, (e.g. the Rwandan Vision 2020);
- Making the case for taking steps to address the emerging challenges of globalization and the information age;
- An analysis of the limitations and potential for transforming the Rwandan economy and society into an information and knowledge-based society and economy;
- A clear statement of the national Vision for social and economic development and the corresponding missions for the realization of the vision, as well as strategies aimed at the attainment of the stated missions;
- Details of specific sectoral development goals directed at transforming the economy and society as per the stated vision, missions and strategies;
- Identification of specific institutional arrangements and structures for facilitating the policy and plan development and implementation process; and
- Details relating to the scheduling of the remaining phases of the national ICT policy and plan development process.

### 4. The SUNRISE model

A key output of the first phase of the process is the SUNRISE model - which was developed as part of the integrated framework to guide development of the first five-year NICI Plan (NICI-2005). The Model provided a framework for identifying suitable programmes, projects and initiatives grouped under the following seven core programme areas:

- S ----- Special ICT Promotion Packages, Incentive Programmes and Policy Instruments
- U ----- Universal Human Resource Development Programme
- N ----- National ICT Initiatives (NICTIs)
- R ----- Resource (Financial and Technological) Mobilization and Deployment
- I ----- Integrated Civil and Public Service Computerization Programme

S ----- Standards, Practices and Guidelines for ICT Deployment and Exploitation

E ----- Enabling Legal Regulatory and Institutional Framework

It is envisaged that the SUNRISE model will be modified based on the outcome of NICI-2005. The model will also serve as a framework for developing subsequent NICI plans within the timeframe of the Rwandan Vision 2020.

On the whole, the phase 1 process was a consultative one that brought on board all key stakeholders: Government, private sector and civil society. Apart from yielding specific deliverables, the consultation apart from yielding specific deliverables, was used to build national consensus on key issues of the policy and plan. It also got a general agreement on the way forward in terms of direction and orientation.

In other words, the aim was not only to come out with specific outputs but also to mobilize the Government machinery, the private sector and the entire society to play an active role in the consultative process on relevant policies and plans for transforming both the economy and the society.

## 5. The Policy Development Phase

The second Phase of the Rwandan process was also based on a consultative approach involving key stakeholders. This culminated in a Policy Document, entitled: 'An Integrated Socio-Economic and ICT Policy and Strategies for Accelerated Development'. In this document, the Government of Rwanda (GOR) recognized the role that ICTs can play in accelerating socio-economic development that leads to an information and knowledge-based economy. On the basis of this acknowledgment, the Government made a number of policy commitments aimed at facilitating and accelerating development, deployment and exploitation of ICTs within the economy and the society. The key policy areas include:

- Creating and facilitating an enabling environment for development of the national information society and economy;
- Implementing special tax packages, instruments, and incentive programmes to promote development of the information economy;
- Developing and deploying of human resources to support and service of the country's information society and economy;
- Facilitating deployment and exploitation of ICTs in the educational system;
- Deploying ICTs to support the operations of the civil and public services;
- Policy on facilitating an investment climate for the mobilization of financial and technological resources;
- Encouraging and facilitating physical infrastructure development;
- Developing standards, best practices and guidelines to guide deployment, exploitation and development of ICTs;
- Creating the necessary enabling regulatory framework for facilitating ICT products, services and systems;
- Enacting the necessary Cyber Laws and Legislative provisions;
- Setting up national ICT structures and bodies;
- Facilitating and promoting national ICT applications;
- Taking gender dimensions into account in national ICT programmes;
- Promoting universal access to ICT;
- Developing a local ICT industry;
- Facilitating the role of the private sector in developing and participating in the information economy;

- Promoting and supporting research and development (R&D) initiatives directed at exploiting opportunities provided by the information society and economy; and
- Involving key national stakeholders and civil society in the process.

As a key aspect of the ICT Policy and Strategy for developing the Rwandan information society and economy, the GOR is committed to putting in place and implementing four 5-year NICI Plans (1st, 2nd, 3rd and 4th NICI) over a 20-year timespan of the Vision 2020 programme. The individual timespan and goals of each these NICIs are:

- *1st NICI Plan (2001 to 2005)*  
Goal: To support development of an economic base and environment for accelerated growth and development, to transform Rwanda into an information-rich, knowledge-based society and economy;
- *2nd NICI Plan (2006 to 2010)*  
Goal: To support the strengthening of the economic base and improvement of the economic environment to accelerate development and growth of an information-rich, knowledge-based society and economy;
- *The 3rd NICI Plan (2011 to 2015)*  
Goal: To facilitate the process of sustaining economic development and growth to improve national prosperity and global competitiveness; and
- *The 4th NICI Plan (2016 to 2020)*  
Goal: To consolidate the process of achieving a middle-income status and an information-rich, knowledge-based society and economy.

## 6. The Plan Development Phase

The third phase of the Rwandan process concentrated on developing the first of the four 5-year NICI Plans (NICI-2005). This phase focused on implementing the policy commitments of the GOR as contained in the Policy document. The details of the Plan are contained in the Report: 'An Integrated ICT-led Socio-economic Development Policy and Plan for Rwanda (2001-2005)'

## 7. Some General Principles that Guided development of the Plan

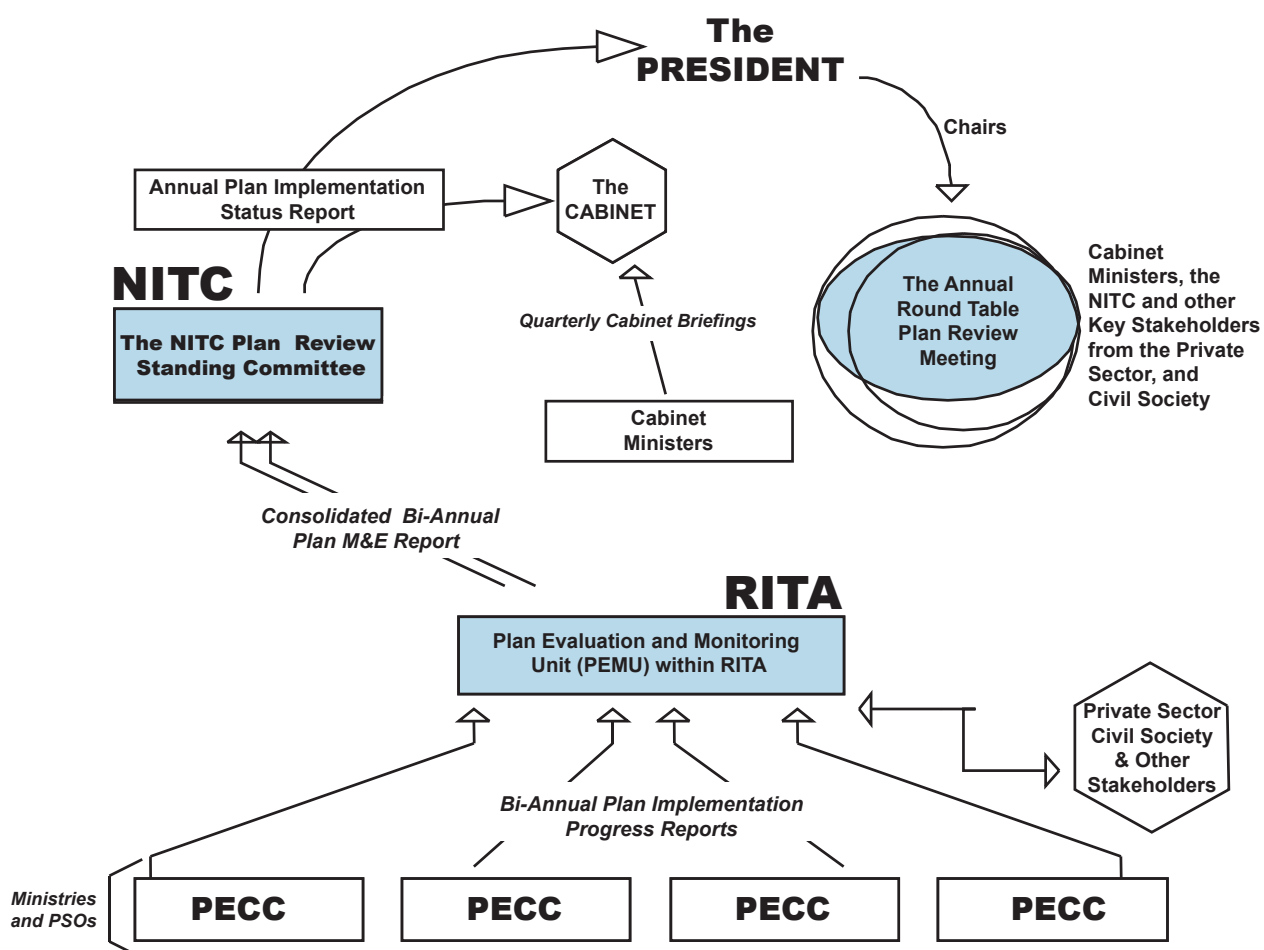
Based on the provisions of the SUNRISE model, and the policy commitments in the Policy document, development of the NICI-2005 Plan was guided by a number of general principles. On the whole:

1. The Plan was aimed at realization of the Vision for Rwanda (VfR) and its relevant Missions and Strategies.
2. The various Programmes, initiatives and the corresponding Action Plans were designed to be practical, realistic and implementable, with clearly stated time-bound measurable (TBM) targets.
3. During the life span of the Plan, the Government will continue to formulate and implement its short-to medium-term socio-economic development and budgetary plans. The NICI-2005 Plan is not aimed at substituting this exercise. Rather, it serves as a point of policy-reference

and a framework for complementing and supplementing this planning and budgeting within the context of the Government's long-term goal of transforming Rwanda into an information-rich and knowledge economy.

4. The Plan was designed to allow for modification, revision and adaptation as the need arises during its 5-year implementation timeframe. As part of the process of building flexibility into implementation of the Plan, efforts were made to avoid specific implementation-details of the programmes and initiatives.
5. The premise was that, for each major programme or initiative, these details will be developed and worked out within the context of a Project Implementation Document or Report during the actual implementation of the Plan. This will take into account the specific circumstances, constraints, and opportunities and developments at the time. This approach also allows for fine-tuning of programme details as the need arises.
6. The Plan also incorporated a Programme Monitoring, Evaluation and Reporting Framework (illustrated in figure 2 below) that allows for appropriate intervention. The procedures and actions have clear guidelines on how and when these can be activated and by which agency or authority. This Framework was developed to facilitate and co-ordinate an enforceable, bottom-up monitoring and evaluation mechanism and reporting procedure. A number of key players are involved, namely: the Programme Execution and Co-ordination Committees (PECCs) of the Government Ministries and PSOs, the Programme Evaluation and Monitoring Unit (PEMU) of Rwanda Information Technology Authority (RITA) and the Plan Review Standing Committee (PRSC) of the National Information Technology Commission (NITC). Also playing a key role in this process is the Round Table Plan Review Meeting convened annually by the NITC and Chaired by H.E the President – the National ICT Champion. Finally, a key guiding principle underlying the NICI-2005 Plan is the concept of 'decentralization-and-localization'. Instead of centralizing implementation of the Plan, each Programme or Initiative of the Plan is associated with an Implementation Agency that takes the responsibility for implementation monitoring and evaluation. The Plan, Execution and Coordinating Committee (PECC) of the Government Ministries and PSOs will play a key role in this process.
7. Finally, a key guiding principle underlying the NICI-2005 Plan is the concept of 'decentralization-and-localization'. Instead of centralizing implementation of the Plan, each Programme or Initiative of the Plan is associated with an Implementation Agency that takes the responsibility for implementation monitoring and evaluation. The Plan, Execution and Coordinating Committee (PECC) of the Government Ministries and PSOs will play a key role in this process.

Figure 2. Programming, Monitoring Evaluation and Reporting Framework



Source: Government of Rwanda. An integrated ICT-led socio-economic development policy and plan for Rwanda: 2001-2005.

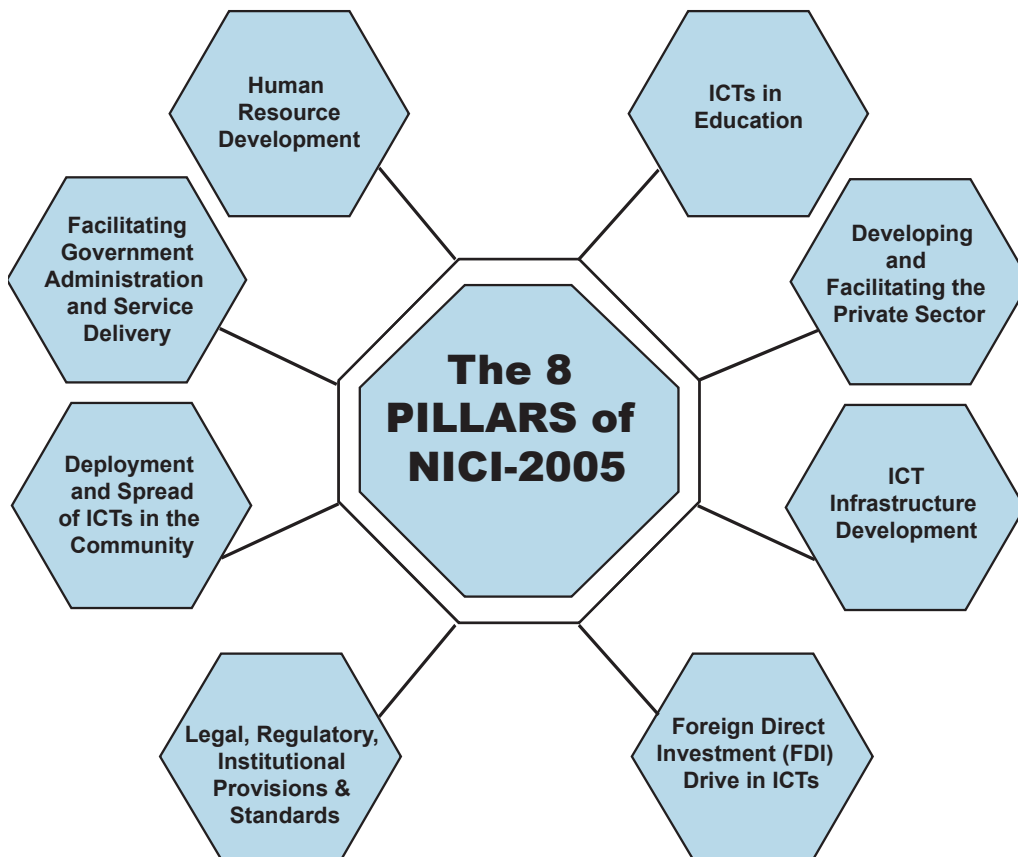
## 8. Components and details of the Plan

1. The NICI-2005 Plan is organized as follows:

- The 8 pillars – each representing a sub-Plan of NICI-2005;
- The Government policy commitments – relating to the area of focus of each of the sub-Plans;
- The sub-Plan programmes and initiatives;
- The programme objectives and goals;
- The Plan-Actions - relating to implementation of each of the programmes of the sub-Plans;
- The Time-Bound Measurable (TBM) Targets – associated with each of the Plan-Actions; and
- The Plan-Action implementation agencies - corresponding to each of the Plan-Actions.

2. The NICI-2005 Plan is built on 8 Pillars of the Plan - each representing a Sub-Plan, as illustrated below:

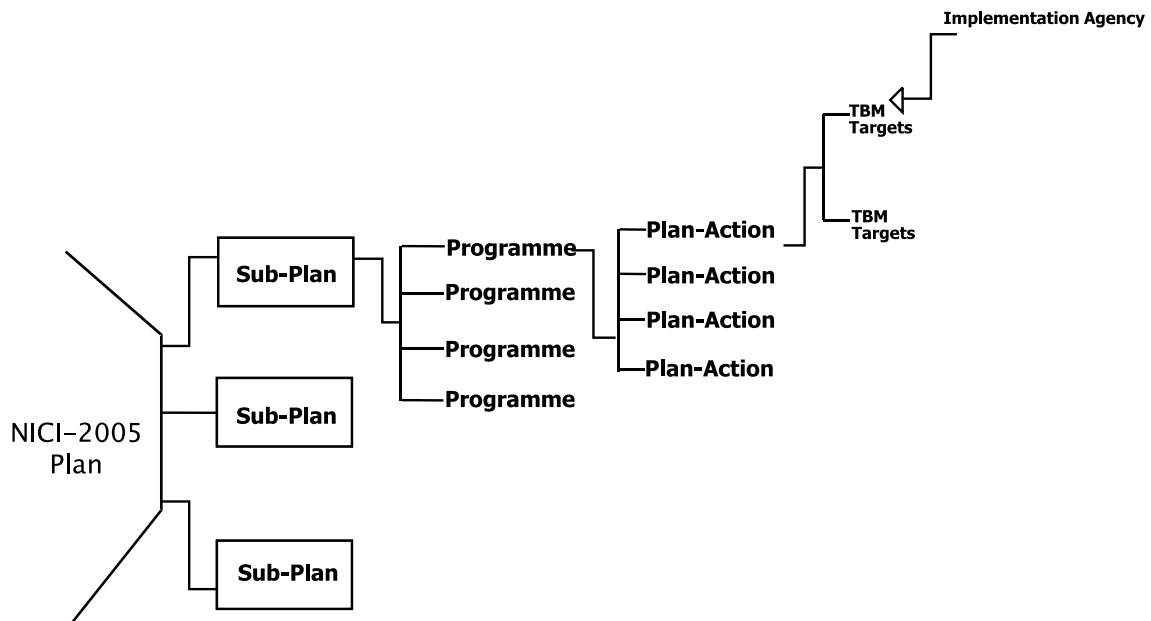
Figure 3. Eight Pillars of the NICI Plan



Source: Government of Rwanda. An integrated ICT-led socio-economic development policy and plan for Rwanda: 2001-2005.

3. For each of these sub-Plans, the relevant Government ICT Policy Commitments are documented. Then, a number of Programmes for implementation under the sub-Plan are identified. The Objectives and Goals of each Programme are documented, followed by identification and description of the specific Plan-Actions to be implemented under the Programme. Each of these Plan-Specific Actions has a number of TBM targets. To complete the process, the implementing agencies are identified for each of the Plan- Actions.
4. Some of the Plan-Actions has associated with them Plan-Action Prerequisites and Linkages. The Prerequisites define what needs to be done before a specific Plan-Action can be implemented, while the Linkages connect the Plan-Action with other Plan-Actions within the NICI-2005 Plan.
5. Also each of the Sub-Plans is analyzed in terms of how they relate to the Vfr Missions and Strategies and the extent to which their implementation will contribute to realization of the GOR multi-sectoral economic development policy and the ICT-2020 policy. The risk factors associated each Sub-Plan are also considered.
6. In a nutshell, the NICI-2005 illustrated below, is a collection of 8 Sub-Plans representing the 8 Pillars of the Plan. Each of the Sub-Plans constitute a collection of programmes associated with a number of Plan-Actions, with specific TBM targets and implementation agencies.

Figure 4. The Structure of the Rwandan Plan



Source: Government of Rwanda. An integrated ICT-led socio-economic development policy and plan for Rwanda: 2001-2005.

## 9. The baseline study to guide development of the Plan

To develop a realistic Plan whose programmes, initiatives, projects and targets take into account the current status of key socio-economic and ICT-related indicators, prior baseline study was carried out. The objective of the baseline study was to compile relevant data on key ICT and socio-economic indicators within the economy and society to serve as a basis for Plan projections and targets.

It is worth pointing out that the aim of the study was not to conduct a comprehensive national survey within the economy and society but rather to carry out a focused study concentrating on indicators that relate specifically to the Government's ICT Policy commitments.

The study draws on both primary and secondary sources of data. Some of the key indicators targeted included those relating to the economy (key socio-economic indicators) and the level of ICT exploitation, deployment in key sectors of the economy including:

- Private sector;
- Civil and public service;
- Agricultural sector;
- Industrial sector;
- Service sector;
- Education and health sectors;
- Human resource development capacity;
- Employment levels in key relevant sectors;
- Demand and supply of ICT-related skills within the country;

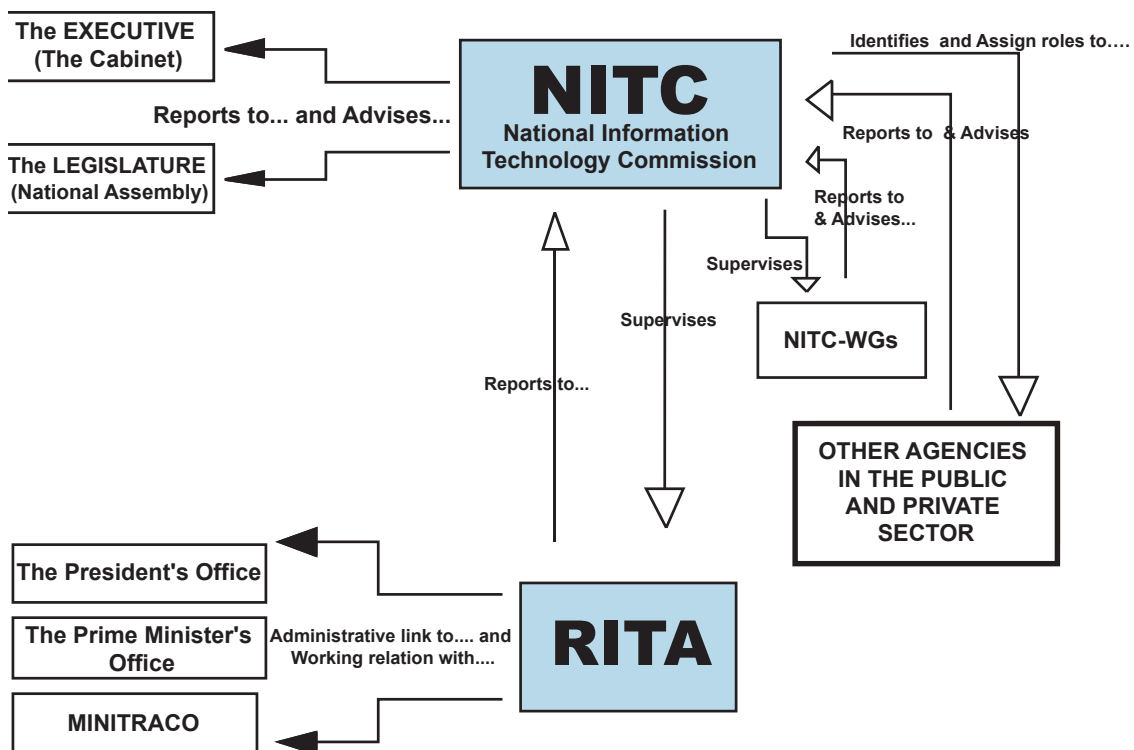
- The ICT infrastructure with specific reference to the:
  - ◆ *Physical infrastructure (transport, electricity, etc) ;*
  - ◆ *Telecommunications and internet infrastructure;*
  - ◆ *Communications and the mass media infrastructure; and*
  - ◆ *Others.*

## 10. The Supporting Structures

The National Information Technology Commission (NITC) and the Rwanda Information Technology Authority (RITA) are two of the new structures specifically set up to facilitate implementation of the policy and plan. NITC, chaired by the Prime Minister with membership comprising senior Cabinet Ministers, distinguished representatives from the private sector, academia, and civil society is the highest policy formulation and implementation body in charge of developing the Rwandan information economy and society. Reporting to the Cabinet and the National Assembly, NITC is charged with advising the Government on all matters relating to policies, strategies, and plans for the deployment, exploitation and development of ICTs to support the socio-economic development of Rwanda. RITA is set up as a statutory and autonomous national agency to act as the coordinating body for implementation of the ICT plan under the direct supervision of the NITC.

Illustrated in figure 5 are the interrelationships between these two structures and how they relate to other entities:

Figure 5. Structural Interrelationships



Source: Government of Rwanda. An integrated ICT-led socio-economic development policy and plan for Rwanda: 2001-2005.

## 11. Conclusion and Lessons Learnt

The critical success factors: The Rwandan ICT Policy and Plan development process yielded one of the most comprehensive and integrated ICT-led socio-economic development policy and plan in Africa. The success of the Rwanda process can be attributed to a number of critical success factors; these include:

- Top-level political leadership support and commitment to the process, without which no implementation will be possible. The active national ICT Champion was the President himself;
- A clear national vision, missions and strategies to guide development of the process outputs;
- Government endorsement and commitment to the national vision, missions and the corresponding strategies designed to contribute to the realization of the vision and the corresponding missions are critical;
- The goodwill and the support of the people and their endorsement of the need for the vision and stated missions and their realization are also vital;
- A strategic Government Ministry that provided national leadership on behalf of the Government;
- Dedicated policy-and decision-makers and professionals, cutting across the public and private sector who are committed to the process;
- The adoption of a well-scheduled step-by-step phased out approach with specific milestones and deliverables;
- The identification and the setting of realistic objectives and targets that can be achieved within a given time-frame;
- A well-researched exercise that made an effort to learn from the experiences of a number of countries;
- Access to all Ministers, Parliamentarians and all key stakeholders to facilitate consultation and across-the-board contribution to the process and its deliverables;
- Over 20 rounds of dialogue sessions with key stakeholders - Government, private sector and civil society;
- The NICI development process was performed in parallel with telecom policy reform and programme implementation (liberalization of the telecom sector; generalization of Internet Service provision to the private sector and research institutions; process of privatizing Rwandatel; creation and funding of RITA, etc.);
- Excellent logical support and facilitation on the part of the ECA Subregional Office - SRO-East Africa);
- Continuous push from the top for action and results; and
- The realization that Rwanda has no other choice in the matter.

The Rwandan ICT Policy and Plan development process, which borrowed some concepts from the Mauritius process, which in turn was based on the Singaporean experience, is one of the most innovative in Africa. Rwanda is generally considered as having one of the most integrated socio-economic ICT policy development and implementation framework. It is also one of the countries with the highest top-level Government support for the process. In fact, the success of the Rwanda process is to a large part attributable to the role played by the President in providing personal leadership. A number of African countries are learning from the Rwanda process.

It is also worth pointing out that Rwanda's integrated ICT-led socio-economic development policy and plan went far beyond the requirements that UNDP stipulated in the recently released Digital Opportunity Initiative (DOI) Framework for developing ICT policies and strategies in developing countries.

#### **BOX 4**

##### **Summary of the Key Milestones of the Rwandan Process**

The key milestones of the Rwanda ICT Policy and Plan development process are summarized as follows:

- November 1998: The ECA/UNESCO/UNDP/USAID National ICT Seminar in Kigali, attended by all Rwandese Ministers and development partners
- June-July 1999: The ECA Study, resulting in the report: 'An Integrated Framework for Socio-Economic and ICT Policy & Plan Development and Implementation for Rwanda'

##### **The Framework**

- October 1999: Submission of the Framework Document to the Government of Rwanda
- October 1999: January 2000: National Dialog on the Framework Document
- January 2000: High-Powered Ministerial Seminar on the Framework Document
- January-February 2000: Development of the Policy Document based on the Revised Framework
- February 2000: Submission of the Policy Document: 'An Integrated Socio-Economic and ICT Policy and Strategies for Accelerated Development' to the Government
- March 2000: Cabinet Adopted and made public the Rwandan ICT Policy and Strategies
- October 2000: The NICI-2005 Presidential Committee set-up by President Paul Kagame
- October 2000 - Feb 2001: Developing the NICI-2005 Plan and Conducting a National Dialog

##### **Consultation on various drafts of the Plan**

- February 2001: 'An Integrated ICT-led Socio-Economic Development Policy and Plan for Rwanda (2001-2005)' submitted to President Paul Kagame
- May - June 2001: Public Meetings and Seminars to discuss the 'Integrated ICT-led Socio-Economic Development Policy and Plan for Rwanda (2001-2005)
- January 2002: High-powered Ministerial meeting chaired by the President to Kick-Start implementation of NICI-2005 Plan

## **B. Case study 2: NICI Plan of Senegal<sup>13</sup>**

*“Thanks mainly to use of ICTs, Senegal will become, in five years, an emerging country with a modern and competitive economy, whose resources will be bolstered and optimized at the national and international levels. ICTS enable a more equitable redistribution of revenues and will contribute significantly to the well being of the population, economically, socially, and culturally as well as in the health and education sectors.”*

### *The ICT vision of Senegal*

#### **1. Background**

In developing its NICI plan Senegal has focused on promoting ICT industries for growth and competitiveness. The private sector and the ICT professionals spearheaded the strategy. The Government of Senegal has played a facilitating role during the various development stages of the plan, and its role has been clearly defined in implementation strategy.

The plan is entitled “The ICT Grape”, reference being made to the definition and management of the overall Senegalese economy into various priority sectors that could be considered as the different “Grapes” in a bunch.

The Plan was commissioned by the “Groupe de réflexion sur la compétitivité et la croissance des entreprises” (GRCC), an institution which was set up by both the Government and the private sector with the support

<sup>13</sup> This case study is based on the “Etude sur l'économie de la grappe des NTIC au Sénégal”, March 2001, by «Cabinet Consultants Associés», commissioned by the «Groupe de réflexion sur la compétitivité et la croissance des entreprises du Sénégal».

of the World Bank. GRCC's main objective was to put in place the regulatory environment, for boosting the competitiveness and growth of the private sector. Development of the plan was piloted by "Cabinet Consultants Associés" with a national NICI Team of 15 persons, co-ordinated by Mr. Abdoulaye Ndiaye, Chief Executive of AGIR and member of the Technical Advisory Committee of the AISI<sup>14</sup>.

The plan was finalized in March 2001 during a national validation workshop, with the participation of the private sector, Government departments, civil society, community-based organizations (CBOs) and international development partners.

## **2. Why the ICT Grape**

Equipped with limited natural resources but endowed with quality human resources and skills, Senegal has always put forward service provision as a key element for its development. This was recently re-emphasized by the policymakers who would like the country to take advantage of the globalization process that goes necessarily with a boom in the service sector, especially those related to ICTs.

The NICI Team believed that because of its geographic position and its human resources, Senegal could fully benefit from the ICT sector in responding to the following development challenges:

- Unemployment reduction;
- Poverty reduction;
- Eradication of illiteracy;
- Better access of populations to healthcare;
- Improvement of economic competitiveness and productivity;
- Improvement of Government sector efficiency; and
- Export development and improvement of balance of payments.

## **3. Confirmation of the choice of the ICT Grape as a priority**

The successful mobilization of the various stakeholders during the needs assessment and development of the Plan confirms that the ICT Grape is seen as a national priority. It is perceived as a sector with good potential for job creation, value-added services and foreign currency earnings. Furthermore, the cross-sectoral dimension of the ICT Grape makes it a support sector to the other economic sectors and it has the capacity to effectively respond to the challenges posed by education and health and for every citizen to contribute to its strengthening.

The economic potential of the ICT Grape was reinforced by a study undertaken by the NICI Team on its capacity to service the subregional West African and the international markets for ICT products and services<sup>15</sup>.

## **4. Sectoral Initiatives**

In addition to the main strategy geared to the export of teleservices and products, which is the main focus of the Senegalese Plan, the NICI Team identified two sectors of major importance to the social development of the country:

- Using ICT to harness education; and
- Using ICT to expand delivery of healthcare.

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<sup>14</sup> <http://www.ECA.org/aisi>

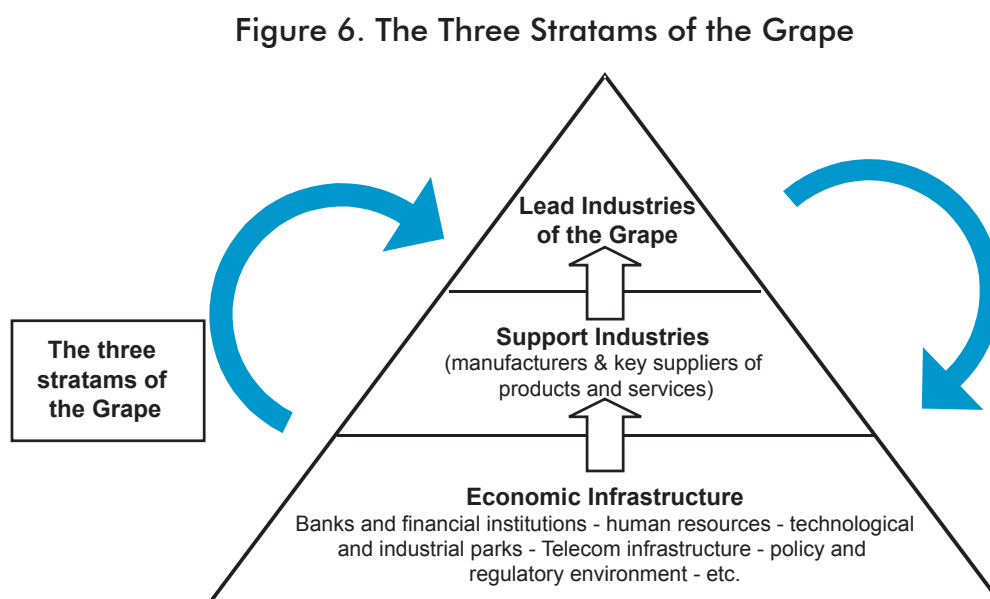
<sup>15</sup> "Étude sur l'économie de la grappe des NTIC au Sénégal: le marché sous-régional et international", mars 2001 by «Cabinet Consultants Associés».

## 5. Methodology Used

The figure above summarizes the three strata of the Grape and their dynamic interaction.

Driven by the private sector, the NICI Plan is based on three levels in figure 6, which shows the three strata of the Grape and their dynamic interaction.

1. The Grape is constituted by industries (products or services) considered as lead industries, which are generally geared to export. In preparing the Plan, the NICI Team raised the following questions and attempted to reply to them in the document:
  - Which types of products and services are offered by the lead industries of the Grape?
  - To which markets are they geared (local or export markets)?
  - Are those industries competitive?
  - What are their relations with the support industries?
  - How are they affected/influenced by the economic infrastructure?
  - How do they interact?
  - What is the status of the Grape? Is it a pre-Grape? A Grape being developed? Or a Grape in full expansion?
2. The support industries are manufacturers and suppliers of products and services. They may quickly become lead industries of the Grape. The main aims of the support industries are:
  - To satisfy the needs of the local market;
  - To export goods and services to the West African subregion; and
  - To export goods and services worldwide.



Source: «Etude sur l'économie de la grappe des NTIC au Sénégal: le marché sous-régional et international», March, 2001 by «Cabinet Consultants Associés».

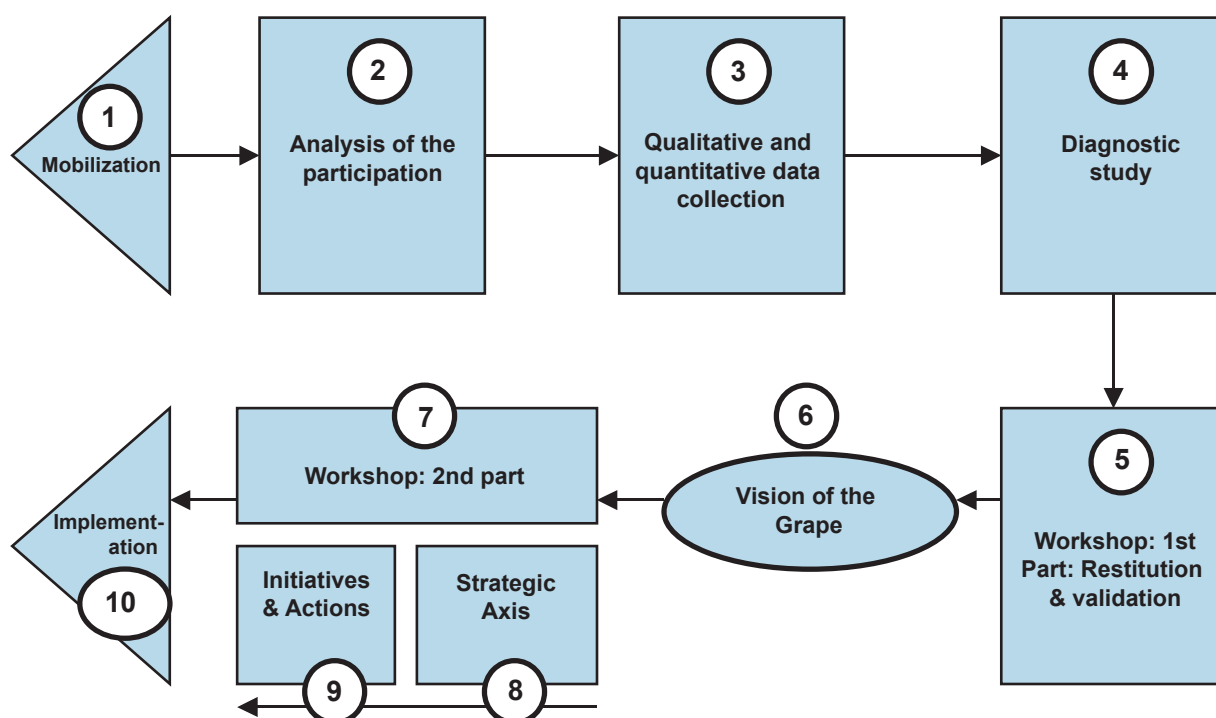
The NICI team raised the following questions when preparing the Plan:

- What are the services that facilitate the emergence of ICTs?
  - What are the products and services that will feed the lead industries of the Grape?
  - How do these industries interact?
  - Which services are most likely to be turned into teleservices?
  - How are they influenced positively or negatively by the economic infrastructure?
3. The economic infrastructure is a key element of the Grape without which no meaningful plan and strategy will be put in place and implemented. They are constituted by:
- Banks and financial institutions: How is the private sector envisaging financing of the ICT Grape? Are there financial institutions which are willing to fund new ICT initiatives?
  - Human resources: Is there adequate linkage between the existing labourforce with the needs of the ICT companies?
  - Technology and industrial parks: Are there enough technology and industrial parks? Are they well distributed in the country? Are there incubator systems to house the Grape's lead industries?
  - Telecommunication infrastructure: Are they of good quality vis a vis the requirements of the ICT companies? Are communication costs favorable to competitiveness of ICT companies? Is the status of the historic telecom operator or the national operator favourable to the expansion of ICT companies?
  - Judicial and regulatory environment: Is it favourable for expansion of the ICT Grape?
  - Logistics services: Are maritime, air and road transport services adequate? Do express courier companies exist?
  - Administrative procedures: Are they simplified and transparent?
  - Standardization and quality-control systems: Do they exist? Are they operational?

***The Grape approach was based on the following main objectives:***

- To secure the commitment of public and private stakeholders to the issue of ICT as an engine of growth in Senegal;
- To carry out an assessment of the ICT sector and single out the advantages and constraints of the sector;
- To validate the results of the assessment and focus on a shared vision between private and public stakeholders;
- To draft an action Plan;
- To identify champions in charge of coordinating and implementing the various programmes of the Plan;
- To identify the institution that will coordinate and promote the various activities identified in the plan; and
- To identify the resources needed to implement the plan.

Figure 7. The Stages and Interlinkages of the ICT Grape Development Methodology



Source: «Etude sur l'économie de la grappe des NTIC au Sénégal: le marché sous-régional et international», March, 2001 by «Cabinet Consultants Associés».

The NICI development process lasted one year. Some of the milestones were:

### Data collection

A comprehensive questionnaire composed of 206 questions was distributed to companies and other organizations representing the potential ICT market. A total of 275 institutions were visited and interviewed by researchers and ICT professionals. Data were processed by statistical software, which categorized the various enterprises and responses into graphs and statistical tables.

### Mobilizing the stakeholders

Over 15 sectoral workshops and national workshops were organized. Securing the commitment of all stakeholders was a key component of the Grape strategy. In the various stages of development of the Plan, interactions with the various stakeholders were constant. Private sector, Government, development partners, civil society, community-based organizations and the media (including national television) were always consulted and their representatives participated in the overall process at all stages. Each group of stakeholders played its role fully.

### The role of the State and Government Commitments

According to the Plan, the Government should play a major role in development and implementing the ICT Grape. The results of the needs assessment and the consultations with various stakeholders have clearly identified the various roles to be played by the Government in the NICI implementation process. The Plan places emphasis on the following areas for Government intervention:

- Model user: because of the weak state of computerization in administration, it is easy for the Government to improve ICT access and usage in the public service. The Government will also use ICT to facilitate access of citizens to administrative and financial information;
- Enabling environment: the State will put in place legislative, regulatory and appropriate fiscal environment to boost ICT companies. Government will also set up an independent telecommunication regulator and a Universal Service Agency; and
- Promotion: in promoting development and use of ICTs, the Government will partner with the private sector in pilot projects that will create jobs and value-added services. In partnership with the private sector, the Government will also develop ICT parks and export zones.

## 6. Conclusion and Lessons Learned

Even though the study was commissioned in the framework of a partnership between the public and private sector, the highest Government authorities have not yet adopted it for implementation. In this regard, it should be noted that the plan will never be fully implemented without the total commitment of the Government, expressed in the form of creation of co-ordinating and implementing institutions and setting up of an enabling policy and regulatory environment.

As recommended by AISI, a participatory approach was used to develop the ICT Grape. Unfortunately, the Government commitment to implement the Plan is lacking and unlike in the case of Rwanda, where President Kagame took the lead and supervised the whole process, in Senegal the highest authorities were not part of the process. In addition, while the ICT Grape was being finalized, other ICT strategies were being developed concurrently with support from international development partners.

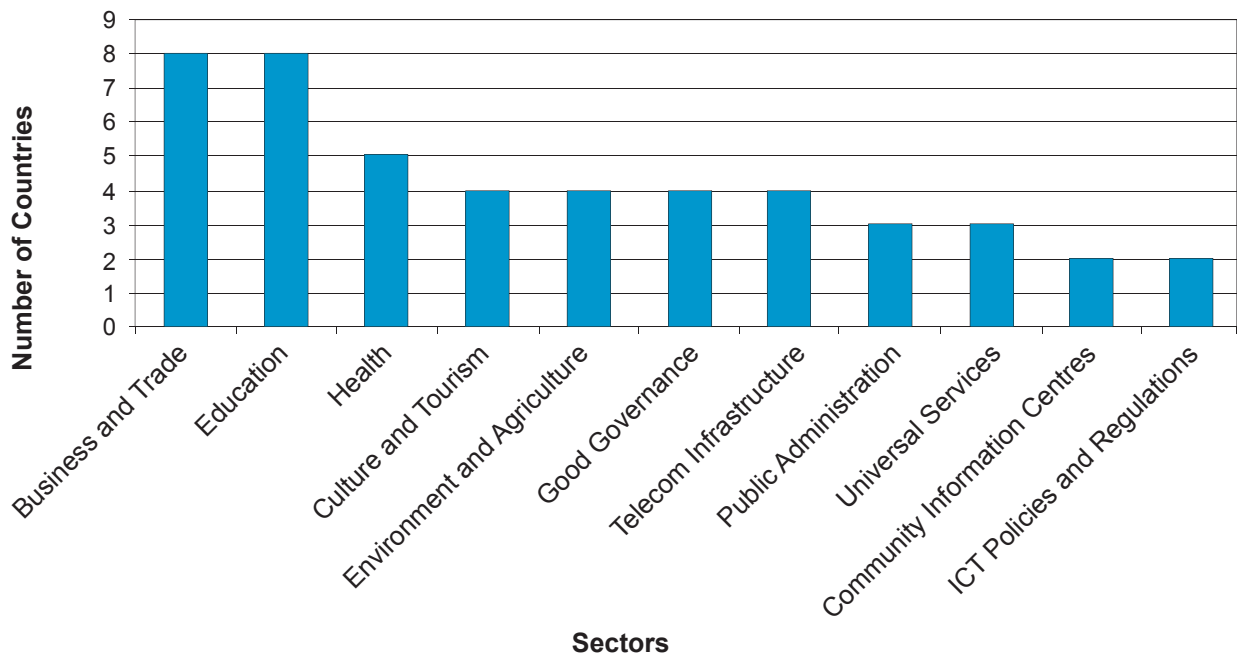
In order to have a viable NICI Plan there is need to involve the highest authorities, and to create a Champion, the President or the Prime Minister. It is not enough to have public figures or private sector champions; a champion must be in a position to change the course of development priorities in a country, and have the power to endorse the NICI Plan for implementation fully.

## IV. NICI Process Analysis

This section complements the above country-based analysis with the analysis on characteristics, trends and various aspects of policy development processes among a group of countries that have moved to implementation phase. Based on the data collected on the NICI plans by Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Guinea, Mauritania, Mozambique and Rwanda, sample analyses were made, with the following results and observations:

- The average duration of the plan-formulation is 17 months. The fastest among the 8 countries completed the NICI plan in 7 months, while one country took 36 months;
- Most of the countries articulated their visions and objectives in the NICI Plan for overcoming geographical features, promoting good governance, improving public administration, developing human resources, generating employment opportunities, advancing economic development and sustaining the democratization process;
- Half of the studied NICI countries selected 4-5 focus sectors, while the other half expanded to target 8-9 sectors; and
- All countries identified business, private sector development and education as their priorities in implementation of NICI policies, as shown in figure 7.

Figure 8. NICI Focus Sectors



Source: Economic Commission for Africa

In addition to the quantitative analysis, feedback from the participants of the NICI consultation workshops was collected to determine the success and the impact of the formulation process on society. Four countries reported active participation and involvement of various sectors in the consultation sessions. Rwanda was the only country that incorporated the views expressed by Civil Society Organizations (CSOs) and the private sector in the Plan. This raises questions not only about the need for such consultations but also about the validation, monitoring and evaluation of the formulation process and plan itself by a wide range of sectors and actors.

The results also implicitly indicate that the gender dimensions of the consultation processes and plan implementation should be carefully monitored, to encourage the participation of women's groups in all phases. As to the impact the plans have had, the case of Mauritania demonstrated that the plan formulation process and the plan itself resulted in major telecommunications policy changes and facilitated liberalization of the telecommunication sector.

## A. Analysis of Lessons from National Strategies

The description of the ICT policy situation in the countries described above shows that diverse approaches have been followed by different nations. However, there are cross-cutting themes in almost all the countries. Among the common themes of national ICT policies across Africa are:

- The need to focus on ICT for human development – harnessing ICT for education, health and other sectors;
- The need to build infrastructure and human resources; and
- The need to build telecommunication infrastructure, and to develop universal access strategies and skilled human resources at all levels.

Although African countries vary in their e-readiness, there are common challenges that are faced by all of them. At the national level, numerous factors influence the extent and speed of development of the knowledge society. These include political stability; physical infrastructure, basic literacy, leadership, culture, policy environment, and basic health care. Further, Africa faces challenges that have regional and global dimensions such as combating HIV/AIDS, human resources, infrastructure development and creating an enabling environment. It is thus important to develop frameworks that cover a cross-section of countries in the region.

Countries used different sets of stakeholders to develop their ICT strategies. Nevertheless, not all the countries have been successful in involving civil society or the private sector. Although all the countries have committed to the increased participation of civil society in the policy development process, overall participation is limited. Mozambique provides a striking example of successful involvement of civil society, by decentralizing policy discussions to the provincial levels.

Although the participation of the private sector is limited, there is overall understanding of the role of the private sector in policy formulation and implementation. In some countries, such as Kenya, the private sector played a key role in advancing an enabling policy environment. Better involvement of civil society and the private sector is one of the challenges facing policy implementation in Africa. Lack of a broad-based private-public sector consensus on the ICT strategy is another major obstacle seen in almost all the countries. In others, the absence of adequate Government capacity to implement, manage, monitor, and respond to the industry's needs is a bottleneck. Progress was made in those countries where ICT strategies are backed by strong national commitment, supported by commensurate financial and executive powers.

The overall ICT policy development and implementation relies heavily on the type of institutions that are driving the process. Countries have different institutions as implementing instruments. The majority of ICT policy efforts are handled by either the Ministries of Communications or the Ministries of Finance and Planning. Countries with streamlined independent institutions seem to achieve more success in articulating the policy and implementing it. For example, although the Ministry of Communications and Information Technology in Mauritius provides the guidelines, implementation of the ICT policy is carried out by the National Computer Board. Rwanda has taken a similar step by establishing the independent ICT agency called Rwanda Information Technology Agency (RITA). Other countries such as Mozambique have succeeded in formulating Policies that have independent ICT policy Commissions. Table 1 shows key institutions that are promoting the ICT policy process in selected countries.

On the other hand, the participation of key Ministries such as that for communication and information technology provides impetus for effective regulatory changes to drive the national information and communications infrastructure forward. The role of Science and Technology commissions and councils cannot be understated. They have played significant roles in policy development and implementation in countries such as Ethiopia, Tanzania and Uganda.

In other countries finding a central locus or institution that coordinates ICT activities has been a major difficulty. In some cases, ICT is regarded as a ticket for a few who are leading the process. This often undercuts participation of other key stakeholders. In other instances, rivalry among multiple institutions and agencies makes it difficult to move towards a national ICT agenda.

While implementation of national strategies remains the key issue in the countries that have begun their e-readiness assessment, articulation of new policies and strategies in the remaining African countries is important. Countries that need to articulate ICT strategies include Angola, Botswana, Central African

**Table 1: Institutions promoting ICT Policy Process; selected countries**

Country	Institution
Benin	Ministère de la communication et de la promotion des technologies nouvelles (Ministry of Communications and Promotion of New Technologies)
Burkina Faso	Délégation générale à l'informatique (DELGI)
Cape Verde	Ministry of Infrastructure
Cameroon	Ministry of Posts and Telecommunications
Cote d'Ivoire	Ministry of Communication and Information Technology
Egypt	Ministry of Communications and Information Technology
Ghana	Ministry of Communications and Information Technology
Kenya	Ministry of Transport and Communications
Lesotho	Department of Science and Technology
Malawi	Ministry of Communications, Science and Technology
Mauritania	Secrétariat d'Etat auprès du Premier Ministre Chargé des Technologies Nouvelles (SETN) (Secretariat of State for New Information Technologies)
Mauritius	Information and Communication Technologies Authority (ICTA)
Morocco	Secrétariat d'Etat aux Postes et Technologies de l'Information (SEPTI)
Mozambique	Commissã o para a Polítoca de Informática (Commission for Information Policy)
Namibia	Ministry of Foreign Affairs, Information and Broadcasting
Nigeria	Nigerian Information and Communication Technology Agency (NICTA)
Rwanda	Rwanda Information Technology Agency (RITA)
Senegal	La Direction de l'informatique de l'état (Information and communication technology secretariat at the office of the President)
Seychelles	Ministry of Information Technology and Communications (MITC)
South Africa	Department of Communication
Swaziland	Ministry of Finance and Planning
Tanzania	Ministry of Transport and Communications
Tunisia	Ministère des technologies de la communication et du transport (Ministry of Communication Technologies and Transportation)
Uganda	Uganda National Council on Science and Technology
Zambia	Ministry of Information and Broadcasting Services

*Source: Economic Commission for Africa*

Republic, Chad, Democratic Republic of Congo, Eritrea, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Libya, Madagascar, Niger, Republic of Congo, Sudan and Togo. These countries face a number of challenges ranging from lack of awareness and commitment from the Government at the highest level to inadequate implementation, monitoring and review mechanisms.

Best practices have emerged on how to develop national knowledge-society strategies and countries new to the process can tap in. A number of countries including Malawi, Uganda and Rwanda are considering ICT-led socio-economic development strategy as an integral part of the United Nations Development Assistance Framework. The United Nations country team in Swaziland is supporting the outcome of a broad-based national strategy and has been at the forefront of its development. Kenya is considering incorporating its ICT strategy into the Poverty Reduction Strategy Paper (PRSP) process.

The ICT policy process in Mozambique and Zambia has been successful in promoting the broad-based participation of key stakeholders such as academics, private sector, local and international NGOs, international organizations, service providers, representatives of local communities and a wide range of Government Ministries. Mauritius' success in ICT growth lies in its ability to set up a Government body that proactively plans ICT initiatives with a focus on people (trained workforce); economy (new information economy); and infrastructure (telecommunications, media and computerization).

In addition to launching diverse ICT projects in key areas of social and economic development, South Africa was able to harness multinational private sector and global expertise in developing its broad-based information society strategy. The use of multi-disciplinary experts in formulation of ICT policy is one of the creative approaches to deal with the diversity of cross-cutting issues between ICT and development. Africa needs to tap into its own expertise in defining strategies and implementing projects.

At national level, there is a need for a framework on knowledge-society policy processes that involve all stakeholders and promote ongoing consultation. A three-stage strategy is generally recommended to arrive at a broad-based and all-inclusive national knowledge-society:

- Development of an integrated ICT-led socio-economic development framework that defines the general problem and policy areas and identifies specific policy issues and orientations. The framework should be based on review and analysis of the current national socio-economic development frameworks, policies and strategies in a given country;
- Development of a broad-based ICT policy generally follows development of the ICT policy framework that specifying Government's policy commitments in relation to the needs; and
- National ICT plans and strategies that provide detailed projects and programmes in key sectors identified in the ICT policy framework, with clear indications of the implementing institutions, time-bound measures and resource requirements.

Clear institutional arrangements and policy instruments are needed to coordinate, support and facilitate the implementation of ICT policies, strategies and plans. Framework structures cover those that provide leadership at the highest level; those that address key sectors; and those that provide independent advice to Government. ICT structures should also provide technical and implementation support for ICT plans and programmes that incorporate the needs of different group of users.

The strategic framework needed should help to guide stakeholders develop their national ICT strategies. Additionally, sectoral ICT strategies should guide the activities in key sectors of social and economic development.

At regional level, the consultation framework brings together countries, experts and stakeholders that are developing and managing information and communication policy and programmes. A partnership and an information-sharing platform are vital to knowledge-society strategies. Such strategies help countries to harness ICT for social and economic development, promote subregional and regional integration and increase Africa's participation in global ICT governance and economy. A regional ICT strategy and a subregional policy research centre are highly recommended.

## **B. Emerging Sectoral ICT Strategy and Policy Issues**

*“Knowledge is at the heart of our Agenda for the Future because we want our country to attain the highest degree of prosperity and progress. Therefore, we assigned ambitious objectives to the sectors of basic and higher education, vocational training, and scientific research; transcending the stage where we had to meet quantitative challenges for a stage where we need to address the challenges of quality and performance...”*

*President Zine El Abidine Ben Ali Carthage, Tunisia November 7, 2000*

The national ICT strategies outlined above are emerging alongside the recent focus on poverty eradication in Africa through the consultative PRSP process. Two-tier approaches in some countries in some countries are enabling maximized progress towards harnessing ICT for development. PRSP stress that advancing ICTs in key sectors such as agriculture, health and education could play a significant role in achieving poverty reduction targets. Other experiences in Africa of two-tier approaches show that electronic commerce and electronic Government remain two key areas that should be pursued vigorously. ECA experience in development of national information strategies suggests eight key elements of a national information strategy. These include:

- Human resources development;
- Development of the private sector and entrepreneurship;
- Promotion of ICT hardware and software sectors;
- Promotion of ICT in such key sectors such as education, health; agriculture, environment and tourism;
- Promoting foreign direct investment in ICT;
- Development of infrastructure;
- Establishing e-government; and
- Creating an enabling policy, regulatory and legal framework.

Experience has shown that the number of sectors for strategy development should be narrowed to focus on the most important priorities and to avoid spreading resources too thinly. There are five critical sectors that emerge from the PRSP process and such global initiatives as the G8 DOT Force and the United Nations Millennium Assembly recommendations. These are:

- Public administration and governance;
- Education;
- Private sector development, electronic commerce and entrepreneurship;
- Agriculture and natural resources management;
- Health; and
- Other sectors such as tourism.

These five sectors are closely interlinked and are also key to poverty alleviation. Improvement in public administration is vital to the creation of an enabling policy and regulatory environment. An enabling policy and regulatory environment ensures that actions taken in the other sectors are encouraged, rather than constrained (as is now the case in many countries) by national and regional policy barriers. Policy change is necessary to ensure that a low-cost ICT infrastructure is put in place for the benefit of all the sectors of society and economy.

Without an emphasis on youth and education, Africa will have insufficient human resources to take advantage of the information revolution and will limit people's access to the social and economic opportunities offered. ICT also promises the potential to cut costs dramatically and improve the quality of both formal and informal training and education, especially within the context of the chronically under-resourced education sector. Likewise, in the health sector ICT will be key in addressing the challenge of HIV/AIDS and delivering cost-effective public healthcare programmes. In business and commerce, globalization combined with the emergence of e-commerce creates opportunities for Africa's entrepreneurs to market their products and services to the rest of the world. ICT can provide the spurt to economic growth on the continent, to fuel improvements in the quality of life for every African. The

**Table 2: ICT Policy Issues, Challenges and Policy Directions**

<b>Sector</b>	<b>Key issues to be addressed by ICT policies</b>	<b>Strategic challenges to be addressed</b>	<b>Key policy directions</b>
Education - use of ICT, in education, distance and life-long learning, educational management information systems and human resources development	<ul style="list-style-type: none"> <li>• Role of ICT in delivery of education and learning outcomes</li> <li>• Universal access to teachers and students</li> <li>• Capacity building for teachers</li> <li>• Prioritization of resource allocation for ICTs</li> <li>• School and university connectivity</li> <li>• Alignment of ICT in education with national human resources development strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Role of ICT in learning outcomes</li> <li>• Infrastructural and resource requirements to wire schools and universities</li> <li>• Partnership and coordination among various players at primary, secondary and higher education levels</li> <li>• Resistance to change by policymakers</li> <li>• Lack of human resources to deploy ICT in the education sector</li> </ul>	<ul style="list-style-type: none"> <li>• National grid for learning – national learning networks that bring all levels of education together</li> <li>• Universal access to ICT in the education sector</li> <li>• Development of university and research networks</li> <li>• Development of school networks</li> <li>• Deployment of technical infrastructure and human resources</li> <li>• Evaluation and monitoring of the impact of ICT in education</li> </ul>
Application of ICT to health – Health information systems, medical informatics, research networks, telemedicine, community health information systems and networks, ICT in the fight against HIV/AIDS	<ul style="list-style-type: none"> <li>• Immediate and priority areas of health in which ICT should be deployed</li> <li>• Cross- stakeholder national strategies to introduce ICT in the health sector</li> <li>• Infrastructural and financial resources for the delivery of tele-health and telemedicine projects</li> <li>• Legal, privacy, security and regulatory frameworks for applying ICT in health</li> <li>• Multiple media strategies to in delivery of health information</li> </ul>	<ul style="list-style-type: none"> <li>• Priorities of health vs. implementation of ICTs</li> <li>• Issues of privacy, security, confidentiality and standards</li> <li>• Poor physical infrastructure in the health sector</li> <li>• Acceptance of new technologies</li> <li>• Awareness of the potential of ICTs for the health sector</li> <li>• Organizing and disseminating health content and knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Development of national ICT in health strategy</li> <li>• Revitalizing physical and technological infrastructure</li> <li>• Development and adoption of guidelines, standards and policies in the areas of security, privacy, confidentiality, etc.</li> <li>• Building hospital and medical networks</li> <li>• Developing national capability in medical informatics</li> <li>• Building community health networks</li> <li>• National tele-health and ICT against HIV/AIDS programmes</li> </ul>
Public administration and governance to improve Government effectiveness, facilitate access to information and improve dialogue and participation in democratic process	<ul style="list-style-type: none"> <li>• E-Government and civil service reform objectives</li> <li>• Business process reengineering requirements</li> <li>• Scope and design of e-Government applications</li> <li>• Human and financial resources requirement</li> <li>• Policy issues such as access rights, quality, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Inequalities due to gender, geography, income, etc.</li> <li>• Standardization and harmonization of policy and platforms</li> <li>• Privacy, security, electronic record problems</li> <li>• Incompatible agendas among governments</li> <li>• Resistance to change</li> <li>• Human and financial resources</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of public access channels using mix of technologies</li> <li>• Development of national e-Government architecture</li> <li>• Development of policies and regulation on tax incentives, privacy, record management, security, etc.</li> <li>• Development of human resources</li> <li>• Creation of a statutory body to develop and implement e-Government</li> </ul>

Sector	Key issues to be addressed by ICT policies	Strategic challenges to be addressed	Key policy directions
Private sector development, electronic commerce and	<ul style="list-style-type: none"> <li>• Nature of incentives to stimulate private sector</li> <li>• Capacity-building requirements for SMEs and ICT providers</li> <li>• Technical and supportive infrastructure</li> <li>• Regulatory, trust and taxation issues of electronic transactions</li> <li>• Role of electronic commerce in national wealth creation</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the needs of SMEs</li> <li>• Need for highly-skilled human resources</li> <li>• Slow rate of technology adoption</li> <li>• Understanding the novelty of electronic commerce</li> <li>• Reconciling outdated regulatory frameworks with emerging needs to support entrepreneurship</li> </ul>	<ul style="list-style-type: none"> <li>• A national framework for electronic commerce</li> <li>• SME capacity-building strategies</li> <li>• Various acts dealing with electronic transactions, security and public protection</li> <li>• Long-term technical and supportive infrastructure rollout plans</li> <li>• Skilled human resource development strategies</li> </ul>
Agriculture and natural resources management – covering areas such as food chain, agricultural markets, early warning, geographic information systems, preservation of natural resources	<ul style="list-style-type: none"> <li>• Role of ICT in delivering strategic information for farmers, Government authorities, and other players</li> <li>• Role of ICT in management of natural resources</li> <li>• ICT role in poverty eradication and empowering the poor and marginalized groups such as women</li> <li>• Flow of agricultural market information and knowledge of governance, information on agricultural products at global levels</li> <li>• Knowledge flow – agricultural and environmental research and indigenous knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Role of multiple technologies and tools</li> <li>• Resistance to change and priorities in rural development vs information and communication technologies</li> <li>• Investment in rural communications infrastructure</li> <li>• Efficient agricultural and environmental information management</li> <li>• Improving literacy and functional literacy to increase widespread access to ICT by farmers and their children</li> <li>• Building working agricultural and environmental networks</li> </ul>	<ul style="list-style-type: none"> <li>• Development of rural telecom infrastructure by catalyzing profitable rural telecom services</li> <li>• Meeting decision-makers' needs for ICT sensitization and education</li> <li>• Ensuring that rural ICT access programmes are built on demand-driven and appropriate technologies</li> <li>• Developing national agricultural and environmental networks</li> <li>• Utilizing the strengths of both new and traditional media</li> <li>• Creation of enabling environments for creative, multi-stakeholder partnerships</li> <li>• Increasing participation of women and youth in rural ICT initiatives</li> </ul>

development of agriculture and natural resources is fundamental to ensure food security - the heart of African development challenge.

It is therefore necessary to develop specific sectoral ICT policies while considering linkages and overlaps among these and other sectors. Table 2 below shows some of the key issues, challenges and directions to be taken when defining sectoral ICT policies in these five areas.

Detailed sectoral policies for each of the above should address gender considerations, opportunities for subregional and regional collaboration, engage the diaspora and accommodate different levels of ICT infrastructure. Sectoral policies also need to allow Heads of Governments and concerned policymakers to provide the necessary leadership confronting existing barriers and promoting innovative solutions. They should engage national and international private industry to adopt, adapt and develop technologies to meet the unique needs and challenges of marginalized groups. Involving civil society ensures that ICT are used in a way that targets and addresses specific development goals and priorities. There is also a need to exchange information on successful sectoral ICT strategies at global levels. Increasing the awareness of policymakers in implementing sectoral ICT policies remains one of the key challenges.

## **C. Awareness, Training and Capacity Building**

*“... eliminating the distinction between information rich and information poor countries is critical to eliminating economic and other inequalities between North and South, and to improving the quality of life of all humanity.”*

*Nelson Mandela, Speech at Africa Telecom '95*

Awareness and capacity building remains one of the major challenges to ICT development in the region. Development of national and sectoral strategies, implementation of programmes and projects in key areas of development requires a highly skilled and motivated workforce. Africa faces the profound challenge of educating, training and integrating a large proportion of its population to move into the emerging information society. Being aware of the implication and opportunities provided by ICTs, information literacy, and digital fluency are becoming the most critical areas for Africa's ICT sector development. The shortage of skilled workers in the ICT field is one of the most daunting challenges of Africa's participation in the global information society. At the higher levels, the region needs highly skilled researchers on ICT and development. Awareness and capacity building requires systematic approaches to human resource development. African countries need to rethink education; improve awareness and information literacy at all levels; improve its research capacity in the ICT field; and engender innovative partnerships between industry, private sector, public sector and research institutions.

## **D. Rethinking Education**

Africa's education system is based on outmoded approaches such as rote learning where students absorb information poured out by teachers. Without transforming Africa's educational system from rote learning to active processes of learning where pupils construct new understanding of the world around them through experimentation, exploration, discussion and reflection, the capacity of the region to evolve into an information society will be limited. Information and communication technologies provide opportunities for new ways of learning. Not only does Africa need to transform teaching and research but also to integrate entrepreneurial skills into education so that knowledge and skills generated through learning and research can be used in business creation. A critical mass of ICT specialists should be trained and maintained to effectively contribute to the information needs of the industry and society.

## **E. Information and Communication Literacy**

A key challenge to Africa is improving the awareness of policy-makers and the public on the opportunities and challenges of ICTs. Although the awareness of policy-makers on the need to integrate ICT into development has improved over the last ten years, existing evidence mainly anecdotal. The majority of the African population is still unaware of the benefits of information and communication technologies.

There is a need to build awareness among decision makers and stakeholders, including organizations on the need to invest in ICT capacity building at all levels of formal and non-formal education. This includes training development workers to incorporate ICTs in their activities. Furthermore, emphasis should be placed on training women and youth in using ICTs and ensuring the inclusion of disadvantaged groups. Policy and decision makers need training and awareness-raising in a number of areas including:

- Implication of ICT to development;
- Development and implementation of socio-economic led ICT policies and programmes;
- Private public partnership in ICT for development; and

- Technology transfer negotiations, with particular emphasis on recent global developments, including the formation and evolution of the World Trade Organization (WTO) with its regulations on Trade Related Intellectual Property Rights (TRIPS).

Educating African policy-makers, researchers and average citizens on how to develop, disseminate and control their own electronic information resources and to appreciate how this process can facilitate their ability to advance their social, economic and environmental is important. Basic understanding of ICTs is fundamental to enable policy-makers to guide their diffusion throughout the social fibre. Broader online literacy is required, as ICTs are becoming popular service delivery channels and increasingly used by the Government, business and financial sectors. Not only do people need to understand the rapid evolution of new information and communication technologies, but they also need to keep pace with the radical changes imposed by their advancement and impact on the social structures at work, at home and in the classroom. At the same time it is important to address the growing functional illiteracy that dis-empowers people from living effectively in a modern society through taking away people's fears of ICTs.

## **F. Research**

Africa's ICT research base is one of the lowest in the world. There is a wide gap between efforts to develop ICT capacity and those pertaining to research. A global effort to improve the research base is required to provide impetus on development of ICT applications; to increase champions; leadership in the creation of skilled human resources; and build entrepreneurship and innovation required to make African countries competitive in global market. A strong training and research base in academia is required to undertake cutting-edge research that help to design and apply new information and communication technologies in an innovative way and to make countries and centres of excellence an attractive international training ground for ICTs. There is also a need to improve capacities in software development and integration; telecommunications; networking; and human-information interfaces that are relevant to the needs of the majority of the African population.

## **G. Partnership**

Effective capacity building requires innovative partnerships between the industry, Government, research and academic institutions. The ICT industry has a vital role in funding, on-the-job training and sponsoring ICT research and capacity building. The private sector has a key role in co-funding and investing in research. Public and academic institutions have a key role in advancing research and capacity on new ICT opportunities for African countries ranging from issues such as the formulation, implementation and monitoring of ICT policies to applications based on open source software.

Africa's quest to harness ICT for development will not succeed without investing in human resources and building the capacity for cutting-edge research. This cannot be achieved without improvements in functional literacy and transformation of education systems. For this to happen, partnerships are required at all levels as well as awareness of policy-makers and the public on the advantages (and disadvantages) of ICTs.

## V. Conclusion

The progress made by African countries as outlined in this Report indicates that the challenge to promote the African ICT agenda has a long way to go. Countries not only need to make efforts to develop national sectoral information society strategies but also need to implement programmes and projects that have an qualitative and quantitative impact on the African society. Certainly, the shift from policy formulation to implementation of programmes is perhaps the greatest challenge facing ICT deployment in African countries. The challenge is not only financial but also institutional. Strategies for improving awareness and capacity building should be pursued vigorously in parallel with resource mobilization from private public partnerships.

Further, the international community needs to coordinate its interventions more effectively, in order to build new partnerships that will create opportunities for all. The private sector, already conscious of its role in building a sustainable business environment for its own prosperity as well as that of others, will need to explore the specific ways in which to be more engaged with development goals and ensure that responsible best practices in enterprise are consistently maintained.

ICTs will undoubtedly remain the key drivers for social and economic development. However, their effectiveness heavily depends on Africa's capacity to achieve a development dynamic centred around enabling policies; progressive regulatory frameworks; accessible and affordable infrastructure; enterprise development; human capacity strengthening; and development of content and applications pertinent to the needs of the African people. Governments have a key role in aligning ICTs with the Millennium Development Goals of reducing poverty; raising levels of education; improving standards of health; enhancing empowerment; and reversing the loss of environmental resources. The role should also extend to national poverty reduction strategies.

The impact of ICT on governance and development is irreversible and needs to be taken advantage of. However, the majority of African countries are yet to put in place good e-governance initiatives and instead, efforts remain confined to IT readiness, web design and connectivity. A focus on e-governance would improve efficiency, transparency, and accountability of institutions. The next wave of national strategies needs to give due attention to ICTs in Government.

Ownership of and access to ICTs needs to be extended to the grassroots and not just to the entrepreneurs and the elite. ICT initiatives should be demand-driven and realized through direct participation and ownership of the people. The shift from policy to pipes and from pipes to people-centred knowledge creation, sharing, and empowerment would enable Africa to foster ownership, reduce national inequalities, ensure adequate resources are mobilized for poverty reduction and thus create an avenue for human-action centred development.

