National Information and Communication Infrastructure (NICI): Best Practices and Lessons Learnt

Table of Contents

List of Boxes

List of Tables

List of Figures

Acknowledgements

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Other partners in the African Information Society Initiative (AISI) include the Partnership for Information and Communication Technologies in Africa (PICTA) and the Global Knowledge Partnership (GKP), which have been working on improving global partnerships for knowledge sharing.

The world has entered the age of the Knowledge and Information Society, driven by information and intellectual products as raw materials. In this context, the ability to build content and transmit information over information and communication infrastructure is a crucial resource for any nation wishing to participate effectively in the global Information Society and to use it to address development challenges.

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We trust that this publication will provide readers with valuable insights into the development of strategic cross-sectoral policy frameworks that not only address broad development goals such as democratic governance and poverty reduction, but also offer critical entry points for introducing ICT as an enabler for development.

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ACRONYMS

ADF	Africa Development Forum
AISI	African Information Society Initiative
ASYCUDA	Automated System for Customs Data
ARAPKE	African Regional Action Plan on the Knowledge Economy
AMU	Arab Maghreb Union
BOT	Build-Operate-Transfer
BOO	Build-Operate-Own
BOOT	Build-Own-Operate-Transfer
BPO	Business Process Outsourcing
BTO	Build-Transfer-Operate
CEEAC	Economic Community of Central African States
CEMAC	Central African Monetary and Economic Community
CePRC	Canadian ePolicy Resource Centre
CODI	Committee on Development Information
COMESA	Common Market for Eastern and Southern Africa
DFID	Department for International Development
EAC	East Africa Community
ECOWAS	Economic Community for West African States
ePol-NET	Global ePolicy Resource Network
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GKP	Global Knowledge Partnership
GNI	Gross National Income
HIV/AIDS	Human Immune Virus/Acquired Immune Deficiency Syndrome
ICT	Information and Communications Technology
IDRC	International Development Research Centre
IPR	Intellectual Property Rights
ISTD	ICT, Science and Technology Division (ECA)
MDG	Millennium Development Goal
MoU	Memorandum of Understanding
MP	Member of Parliament
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NICI	National Information and Communication Infrastructure
NITC	National Information Technology Commission
NITDA	National Information Technology Development Agency
NORAD	Norwegian Agency for Development Cooperation
NSDI	National Spatial Data Infrastructure
NSO	National Statistics Office
OSIWA	Open Society Initiative for West Africa
PAE	Predominantly Agricultural Economy
PECCs	Plan Execution and Coordination Committees
PICTA	Partnership for Information and Communication Technologies in Africa
PIKE	Predominantly Information and Knowledge Economy
PPP	Public-Private Partnership
PSO	Public Sector Organization

PRSAP	Poverty Reduction Strategy and Action Plan
PRSPs	Poverty Reduction Strategy Papers
REC	Regional Economic Community
RICI	Regional Information and Communication Infrastructure
RITA	Rwanda Information Technology Authority
RSA	Republic of South Africa
SADC	Southern African Development Community
SDC	Swiss Development Cooperation
SDI	Spatial Data Information
SICI	Sectoral Information amd Communication Infrastructure
SMME	Small Micro and Medium Enterprise
TEAMS	The East African Marine System
UEMOA	West African Economic and Monetary Union
UNCS	United Nations Commission on Science
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
VICI	Village Information and Communication Infrastructure
WASTIC	West African Strategic Council on ICT
WHO	World Health Organization
WSIS	World Summit on the Information Society

Foreword

Africa's economic performance since the mid-1990s has raised hopes of a possible turnaround, compared to the stagnation of the previous two decades. The new trend is largely credited to policy reforms and better governance although the high average growth rates at the continental level masks large disparities across the continent including the gap between the information rich and the information poor. Advances in information and communication technology (ICT) over the last decade have brought dramatic improvements and unprecedented opportunities for Africa's participation in the global networked economy. The impact of new ICTs has permeated virtually all sectors of society.

This publication analyses the work undertaken by the United Nations Economic Commission for Africa (UNECA) in the area of national ICT strategies. It also highlights the challenges and best practices and proposes recommendations for future activities given the growing scope, scale and importance of knowledge in the global economy.

It is of paramount importance that African countries embrace a common vision and strategy for an information-based society that not only recognizes ICT as a tool for economic innovation, but also as a platform for socio-economic development. Access to information and knowledge is a prerequisite to reducing poverty and achieving basic healthcare and education, all part of achieving Millennium Development Goals (MDGs).

The threats posed by the digital divide calls for an all-inclusive approach that should result in improved economic development by ensuring equitable access to and use of ICTs. Those nations that succeed in harnessing their potential can look forward to improved economic growth and human welfare and stronger forms of democratic governance. The formidable and urgent challenge before national governments is to bridge this divide and connect the remainder of the world's population whose livelihoods can be enhanced through ICTs.

ECA's early efforts to promote ICT for Development (ICT4D) culminated in the launch and adoption of the African Information Society Initiative (AISI) at the Conference of African Ministers in charge of planning and social and economic development in 1996. AISI is an action framework to build Africa's information and communication infrastructure in acknowledgement of the pivotal role ICTs can play in promoting the socio-economic development of the continent.

With the support of partners, ECA is currently working with member States to develop appropriate e-policies, known as National Information and Communication Infrastructure (NICI) policies and plans within the AISI framework. So far, more than 30 African countries have embarked on the development and implementation of these policies and plans. This in turn, has improved the efficiency and mobilization of resources for building an Information Society that supports national objectives.

In the new repositioned ECA, ICT activities have been scaled-up in member States. There is a critical mass of countries with national policies in place and ECA is assisting countries with implementation. As a result of these policies, more focus is also being given to countries that are seeking to shift to more knowledge-intensive economies.

It is also an opportune time to reflect on ECA's work since the two phases of the World Summit on the Information Society (WSIS) that called for renewal and reinvigoration of the Information Society to promote economic growth to meet the MDGs.

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Preface

This publication is the product of coordinated and sustained efforts to track the status and impact of the National Information and Communications Infrastructure (NICI) process in Africa. The case studies cited demonstrate efforts undertaken in some countries to harness the potential of ICTs through the NICI multi-dimensional and multi-stakeholder approach. The studies also analyse the critical success factors and conditions for such factors to be effective and identify challenges and obstacles that need to be addressed to ensure the effectiveness and sustainability of the contribution of ICTs to development for all.

The experience of a number of countries working under conditions of severe shortage of resources, complex political environments and acute socio-economic problems, demonstrates that bold actions to bring their societies into the digital age is beginning to reap dividends. This is indicated by tangible positive results in economic, social and political terms. It also becomes clear that there is no one single formula for a successful ICT for Development (ITC4D) programme as every ICT strategy and plan should be tailor-made to fit the particular national context. Sectoral policies and implementation strategies must also be designed to fit the specific economic, political and institutional features of each country.

This publication seeks to summarize this experience so that other countries can benefit from lessons learnt and find their own approach to bringing ICTs to the service of their development. The diffusion of best practices and lessons learnt, in particular the exchange of information on locally/regionally appropriate solutions, will go a long way in ensuring extensive and innovative use of ICT4D.

Some developing countries can successfully go most or all the way on their own, but many others will need substantial financial and technical support to help them along. We call upon the international community to support Africa's effort to be part of the knowledge society by providing adequate financing on a win-win basis.

Structure of the publication

The publication attempts to capture the lessons learnt by the Commission as a result of almost a decade of national and subregional ICT policy-making. The decision for ECA support to national e-policies came as a result of AISI implementation, which called for countries to develop guiding policy and infrastructural frameworks to optimize the use of ICTs in carrying out their socio-economic development agenda. Later, the WSIS process and Action Plans from Geneva and Tunis reinforced this thinking (chapter 1).

How policies are formulated, based on a nation's development priorities and goals, are critical factors for the sustainability of any e-strategy. Having assisted countries in their formulation of NICI policies, an assessment of the process is undertaken for Rwanda (chapter 2), and also for Ghana, Malawi and Nigeria (chapter 3).

Another distinguishing feature of the ICT policy process in line with AISI is the assistance being given to Regional Economic Communities (RECs) to implement their Information Society programmes and initiatives. Chapter 4 provides an overview of the various activities being undertaken by the RECs in using ICTs for regional integration objectives.

Enhanced access to quality information will undoubtedly improve decision-making at all levels once policies are being implemented. Therefore, the monitoring and evaluation of ICT activities becomes an important complementary activity, with relevant information on the physical infrastructure and on aspects of ICT impact on other economic and social sectors. Chapter 5 provides an overview of the ECA initiative for measuring ICT impact and collecting necessary indicators in member States. Chapter 6 provides the status of NICI policies and plans and where countries are with their implementation. It summarizes the challenges and progress made, taking the critical success factors into account.

The NICI process is geared towards enhancing the penetration of ICTs in all areas of socio-economic development. The process also provides the enabling environment for nurturing and optimizing the benefits of the knowledge and digital economies. This knowledge factor is significant, as knowledge is becoming an important driving force of economic growth. This is the main focus of chapter 7's assessment of what needs to be done by African countries.

Chapter 1

ICT4D Policies and Strategies in Africa

1.0 Introduction

ICTs are among the driving forces of globalization. African countries are facing new challenges of socio-economic development as a result of this globalization process and the impact of the emerging new information age. While there has been global progress in improving access to ICTs and awareness of their potential, access to these technologies remains extremely uneven as evidenced by ICT-related growth and productivity which are, to a large extent, confined to developed economies.

Box 1.1: United Nations Secretary-General on ICT

"Information and communications technologies (ICTs) are crucial in spurring development, dignity and peace. Let us turn the digital divide into digital opportunity. Governments, civil society, the private sector, academia and others must join forces to "promote new business models, public policies and technology solutions in the global approach to development."

Secretary-General Ban Ki-moon - Steering Committee of the Global Alliance for ICT and Development, California (2007) (http://www.un.org/News/Press/docs//2007/sgsm10888.doc.htm)

The digital divide, characterized by highly unequal access to ICTs, manifests itself both at the international and domestic levels and therefore needs to be addressed by national policy-makers as well as by the international community. Emerging evidence indicates that ICTs are central to the creation of a global knowledge-based economy and can play an important role in accelerating growth, promoting sustainable development and eradicating poverty in developing countries and in countries with economies in transition. This, in turn, facilitates effective integration into the global economy.

Box 1.2: ICT potential

"If any field of endeavour has been touted as [having] the possibility of doing so much, it is the field of information and communication technology (ICT). I therefore wish to start a dialogue on how the knowledge, products, services and promise of ICT can advance and accelerate our national reconstruction process. Above all, my country needs human and intellectual capacity to turn our dreams into reality. We are establishing a steering committee to draft a national ICT policy, [a committee that will] identify the most beneficial implementations of ICTs,"

Liberian President H.E. Ellen Johnson-Sirleaf's address to diplomats and technical professionals, Sept. 2006: http://www.nique.net/issues/2006-09-15/news/3

African countries have embarked on national e-strategies and e-policies mainly because of the challenges of globalization and the information age. An effective e-policy is seen as a mechanism for facilitating the transformation of economies into ones based on information and knowledge. As a result, governments will need to continue to play a proactive role in taking stock of ICT initiatives, and provide national guidance to enable the development and propagation of technologies that benefit citizens in the long run. This, in essence, underscores the importance of national ICT policies and e-strategies.

Reaping benefits from ICTs in developing countries will therefore be linked to the early adoption and implementation of integrated and comprehensive development strategies for the sector. Substantial benefits will accrue for countries implementing enabling ICT policies and these include economic growth, employment creation, and poverty reduction. The African political leadership itself has recognized these facts and this is reflected in many public statements by Presidents and Heads of State.

In the same vein, H.E. President John Agyekum Kufuor, President of the Republic of Ghana, noted that ICTs provided the competitive edge for business and the overall socio-economic development of the country. *"In recognition of this, government continues to invest in world-class information technology systems to attain a leadership status in West Africa."*[1]

Box 1.3: Role of ICTs
"We have said it time and again: the role of ICTs in national, regional, and continental development and, specifically, in wealth creation, employment generation, and poverty reduction, cannot be over-emphasized. Disease, illiteracy, poverty and other ills are real social challenges that must be addressed if we are to attain a good quality of life. Fortunately, ICTs present themselves as key potent tools that can be used to address a number of these challenges."
Speech by His Excellency Mr. Paul Kagame, President of the Republic of Rwanda, at the official opening of the Regional ICT Investment Summit in Kigali, Rwanda, 4-6 May 2006

The United Nations Commission on Science and Technology for Development report (UNCSTD, 1997)[2] concluded that developing countries needed to intervene strategically if they were to successfully integrate ICTs and sustainable development. This intervention should be in the form of effective national ICT policies that support the new regulatory framework introduced, promote the selective production and use of ICTs and harness their diffusion for organizational change in line with development goals. ICT strategies and policies, when linked to development objectives, redefine sectoral policies, institutions and regulations, taking into account the need to be responsive to the issues of convergence.

1.1 ECA's response to ICT4D policy-making:

Recognizing the important role that ICTs play in facilitating attainment of development goals and their multiplier effects on growth and economic and social development, ECA responded to the challenge and launched AISI in May 1996. This initiative was a common vision to bridge the digital divide between Africa and the rest of the world and more importantly, to create effective digital opportunities to be developed by Africans and their partners and speed the continent's entry into the information and knowledge-based global economy. The digital divide continues to pose a serious socio-economic development threat to African countries and AISI attempts to address this threat by recognizing the role that ICTs can play in accelerating the socio-economic development process and in the fight against global poverty.

[1] Speech by the President at the Ghana Information Communication and Technology (ICT) Awards, 12 August 2007.
[2] United Nations Commission on Science and Technology for Development, 1997. Report of the Working Group on ICTs for Development prepared for the 3rd Session, 12 May, Geneva, Switzerland, 1997.

AISI is the action framework that has been the basis for information and communication activities in Africa for the last ten years. It also represents a regional framework to support the implementation of the New Partnership for Africa's Development (NEPAD). Africa's commitment to ICT4D is also reflected through the NEPAD Action Plan, where ICT projects and initiatives have been initiated to speed up subregional/regional connectivity. In this context, AISI was selected as the guiding framework for coordinating the support of United Nations agencies to NEPAD. AISI also represents a mechanism for achieving the MDGs[3] in Africa as seven of the eight MDGs are addressed in the AISI framework (table 1). While use of ICTs is not a panacea for all development problems, they offer enormous opportunities to narrow social and economic inequalities and thus help achieve the MDGs. His Excellency, Mr. Paul Kagame, President of the Republic of Rwanda, during the World Summit on the Information Society (WSIS), stated that:

Box 1.4: African Information Society Initiative (AISI)

AISI is a common vision for Africa's quest to bridge the digital divide.

It was adopted by the Economic Commission for Africa (ECA) Conference of Ministers, in May 1996 and subsequently endorsed by the Organization of African Unity Heads of State and Government, and at Summits including the 1997 G-8 Summit. Several implementation activities have taken place in the following areas:

- Policy awareness;
- Training and capacity-building;
- National Information and Communication Infrastructure (NICI) plans;
- Development information;
- Democratizing access to the Information Society;
- Sectoral applications; and
- Infrastructure development for Internet connectivity.

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"*Today we all recognize that ICT is not a matter of choice; it is a necessity. It has become abundantly clear to us in Africa that ICT is an indispensable tool in the achievement of our development outcomes, as well as the Millennium Development Goals (MDGs)"*[4].

His Excellency, John Agyekum Kufuor, President of the Republic of Ghana also noted in his address delivered at the Opening Ceremony of the Second Preparatory Conference on the World Summit on the Information Society (WSIS) that:

"It is important that we use the opportunities created through the African Information Society Initiative of the ECA to link the implementation of the African strategies to the global Action Plan to achieve the Millennium Development Goals"[5].

[3] http://www.undp.org/mdg/

[4] www.itu.int/wsis/ - His Excellency, Mr. Paul Kagame, President of the Republic of Rwanda, General Debate, Plenary Session 1, WSIS Geneva, 2003.

[5] Address delivered at the Opening Ceremony of the Second Preparatory Conference on the World Summit on the Information Society (WSIS) by H.E. John Agyekum Kufuor, President of the Republic of Ghana, Accra, Ghana, 2-4 February 2005.

Table 1.1: Link between AISI and MDGs

	Millennium Development Goals	AISI Challenges and Opportunities
1	Eradicate extreme poverty and hunger	Food security-related objectives
2	Achieve universal primary education	Education and research
3	Promote gender equality and empower women	Gender and development
4	Reduce child mortality	Health
5	Improve maternal health	Health
6	Combat HIV/AIDS, malaria, and other diseases	Health
7	Ensure environmental sustainability	Man-made crises and natural disasters

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On ICTs and poverty reduction, H. E. Thabo Mbeki, President of the Republic of South Africa stated,

"This NEPAD e-Schools project will ensure that our learners, educators and entire communities have access to information and communications technologies. This is what will empower us to do things that will change our lives, our country and our continent for the better. Let us use this technology to do things better, develop African brain power that will pull our country and the African continent as a whole out of poverty."[6]

Since the launch of AISI, ECA has been supporting member States to embark on the development of NICI policies, plans and strategies. This activity is considered as an important implementing mechanism. Currently, more than 30 countries on the continent have embarked on such policies. ECA support has been in the form of upstream policy advice to assist countries in the design of strategic approaches to ICTs as an enabler for development with links to Poverty Reduction Strategies (PRS) and related development goals. This has been complemented by support for the priority programmes based on a multi-stakeholder approach and on innovative national and global partnerships that secure the required resources and expertise.

[6] H.E. Thabo Mbeki at the launch of the NEPAD e-schools project at Maripe Secondary School, Bushbuckridge, in Mpumalanga Province, RSA, 17 April 2007.

1.2 What is NICI?

AISI provides the roadmap to guide African countries in addressing the challenges of the emerging globalization and the information age by developing and implementing NICI policies and plans within the wider national socio-economic development objectives, strategies and aspirations. NICI provides the framework within which ICTs are mainstreamed into the national planning process in order to facilitate the achievement of national and sectoral development priorities and objectives. It is an ongoing process through the planning, implementation and regular evaluation of programmes and projects developed according to the needs and priorities of each country.

Box 1.5: What is NICI?

- An exercise for developing national ICT policies and strategies and implementable programmes;
- A guiding framework for integrating ICTs into national development programmes;
- A mechanism to implement the global vision of the African Information Society Initiative (AISI) at national level;
- A national response to facilitate the digital inclusion of Africa and its integration into the globalization process;
- A monitoring and evaluation tool of the role of ICTs in national development – SCAN-ICT - an initiative to monitor progress and achievements in the Information Society;
- A coordination mechanism between various stakeholders and funding agencies.

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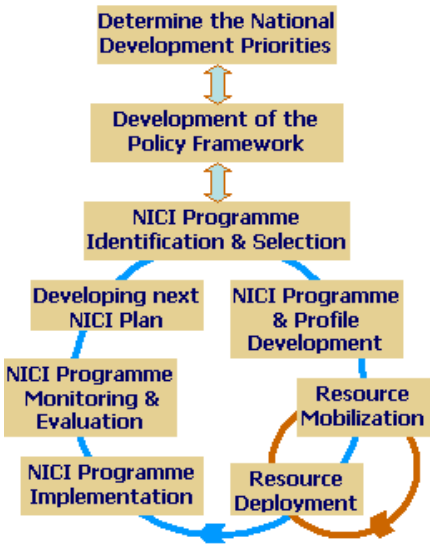
Policies and plans under this framework could be defined as an integrated set of decisions, guidelines, laws, regulations and other mechanisms geared towards directing and shaping the production, acquisition and use of ICTs. The process is based on national needs and development priorities as determined by all the relevant stakeholders. Governments play a central role in the creation of an enabling policy and legislative framework to promote an integrated NICI. In addition, an enabling environment will address the challenge of the massive capital outlay required for ICT deployment in Africa. The NICI therefore represents a long-term strategy to develop infrastructure, human capacity, content and applications as an integral part of overall national development.

The NICI development cycle

As part of the NICI formulation process in member States, ECA popularized the methodology in the form of the NICI cycle undertaken in phases related to specific deliverables as shown in figure 1:

Figure 1.1: The NICI Cycle



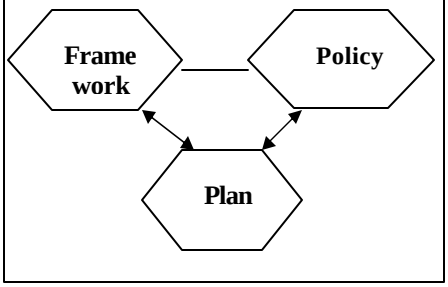
Thus, NICI provides the framework whereby ICT strategies and plans are integrated into national and sectoral development plans to facilitate the achievement of national and sectoral development priorities and goals. The methodology is such that the NICI process is conducted in phases with each phase yielding specific, but inter-related deliverables (see figure 1.2).

NICI has three components:

- Framework;
- Policy; and
- Plan.

Phase 1: The Framework Document reviews and analyses the current national socio-economic development policies, strategies and provisions as well as ICT development, deployment and use in the country through a baseline study. The document also identifies the developmental challenges of the country and makes the case for developing the information economy and society as a way of addressing these challenges.

Figure 1.2: The inter-related entities



Phase 2: The Policy Document provides details of specific government policy commitments in relation to WHAT needs to be undertaken through the use and development of ICTs.

Phase 3: The Plan provides details of HOW the policy commitments are translated into concrete programmes and initiatives guided by government policy commitments. The plan, the first of a series, serves as a cornerstone for the country's socio-economic development over a specific

timeframe. Within the NICI cycle, a number of plans can be developed and implemented. The entire NICI cycle process is based on the rollover of plans, as they are not mutually exclusive and each plan can roll into another.

Phase 4: The Implementation involves the actual carrying out of the specific programmes in the Plan. Once the Plan is developed and implemented, progress is monitored and evaluated on a regular basis.

The following are critical to the successful implementation of NICI plans:

- Expansion and deployment of physical infrastructure;
- Development of human resources;
- Establishment of a stable and predictable legislative and regulatory framework;
- Content development;
- Introduction of ICT applications in key social and economic areas;
- Creation of an information economy; and
- Links to national, regional and global development goals.

1.3 Regional policies and plans

As countries formulate national e-strategies and regional information policies and plans, it becomes necessary to harmonize legislative and regulatory frameworks, thereby building economies of scale for developing infrastructure capacity and expanding markets. The Regional Information and Communication Infrastructure policy and plan (RICI) is a process aimed at harmonizing national strategies at the subregional level for consistency with regional economic integration goals in the area of ICTs (see chapter 4). Regulatory integration at the regional level results in the creation and strengthening of associations of regulators to facilitate cross-boarder interaction, market enlargement and enhancement of the potential for cost sharing through joint projects at subregional and regional levels. This becomes strategic, particularly in relation to the financing and strengthening of subregional and regional backbones to enhance connectivity. The development of common networks and backbones will improve universal access and narrow the digital divide in Africa.

Sectoral policies and plans

ICTs have themselves become an important sector of economic activity that can achieve high rates of growth in both developed and developing countries. It is a strategic, instrumental sector that promotes competitiveness and economic growth and can stimulate widespread, lower-cost delivery of public services in all sectors. In parallel with the formulation of NICI policies, a number of countries have embarked on activities geared towards the translation of the NICI visions and objectives into sectoral strategies referred to as Sectoral Information and Communication Infrastructure (SICI) policies and plans. Sectoral strategies are tailor-made for the specific needs of each sector and accord each sector the opportunity to build on its strengths and adapt to its needs.

Sectoral policies have enabled various groups and sectors to identify their ICT gaps and devise appropriate and corresponding responses. This dimension also requires strategic policy-making on the need to integrate ICTs to realize national policies. Also important is

sectoral strategy development to realign ICT investment and interventions towards achievement of the MDGs.

SICIs provide a framework for programme planning, project development and implementation at the level of sector, and tie together various policy levels, in pursuit of a common sectoral consensus on objectives, clear roles for the social partners, and building and sharing sectoral knowledge.

Box 1.6: Uganda e-health policy
The Government of Uganda embraced ICT as a tool for enhancing health care services for poverty eradication and attainment of the MDGs. ICT has been an important element in the Ugandan President's strategy to modernize the country and improve access to health services and health information. This led to the development of an ECA-supported Health Sector ICT policy, strategy and action plan synchronized with the Health Sector Strategic Plan. The policy addresses the health information gaps and the limitations in access to quality health services and will be presented to Cabinet and Parliament for approval before the end of 2007.

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Community/village policies and plans

To emphasize the importance of ICTs at the decentralized community level, the concept of Village Information and Communication Infrastructure policies and plans (VICIs) is also developed under the AISI framework and philosophy. This accords ICT access and provides an opportunity for developing ICT initiatives at the micro/local levels. VICI advantages include:

- Ensuring buy-in of the process at the local government level, thereby sharing and spreading the responsibilities of implementable policy-making across the political ladder;
- Providing opportunities for 'champions' at the regional/local levels in ICTs;
- Enabling more effective and faster implementation of the policy when regional and local governments are involved;
- Democratization of the policy process to spread knowledge of the role of ICTs in development throughout the country; and
- Offering opportunities for scaled-up implementation to achieve the universal access goals.

On the constraints side, some of the strategic challenges to be addressed include:

- Prioritizing ICTs for rural development in the area of education, health, agriculture, employment, etc;
- Securing investment in rural ICT infrastructure;
- Increasing literacy, both formal and functional; and
- Enabling widespread access to ICTs by farmers, small-scale entrepreneurs and traders among others.

After successful formulation of NICI, SICI and/or VICI policies and plans, the next step involves implementation, monitoring and evaluation. This level generally has two operational categories, namely 'key initiatives' (how certain objectives will be implemented) and 'actions' (more specific to an area of responsibility – e.g. institutional or geographic).

The inputs and resources required to implement the respective e-strategy have to be identified (institutional structures, staff, or financial resources) and implementation must be regularly assessed and realigned to ensure the efficient use of resources for the targets set.

Monitoring and evaluation is also important for identifying and targeting appropriate interventions, with clear guidelines on actions to be taken and by which agency or authority. Multi-faceted monitoring and evaluation methods are used rather than confinement to the limited scope of objective-oriented performance. In general, policy goals are also assessed in terms of impact, strategic priorities, outcomes, key initiatives, and the outputs and actions that ensure the deliverables.

Box 1. 7: E-traditional governance – Ghana and Swaziland Village Strategies
As a way of democratizing access under the AISI framework and philosophy, a study was launched to establish the ICT needs and potential of a typical traditional Ghanaian village with a view to defining a guiding framework and setting up a programme for use of ICTs by locals for local development. The areas of focus were identified as education and training, culture and tradition, and a counseling resource centre. A pilot project undertaken at the Manhyia Palace in Kumasi established a communication network (fibre optic backbone). The network included an e-museum and a management decision support system. Village ICT programme areas to be targeted at a later date were also identified.
A needs assessment was also carried out in a village in Swaziland. Analysis is in progress.

1.4 Geoinformation and NICI

As AISI implementation progressed from policy formulation to implementation of applications and tools to support the NICI opportunity areas, the importance of geography became obvious. A coordinated development of NICI with spatial data infrastructure (SDI) would result in a geo-enabled NICI.

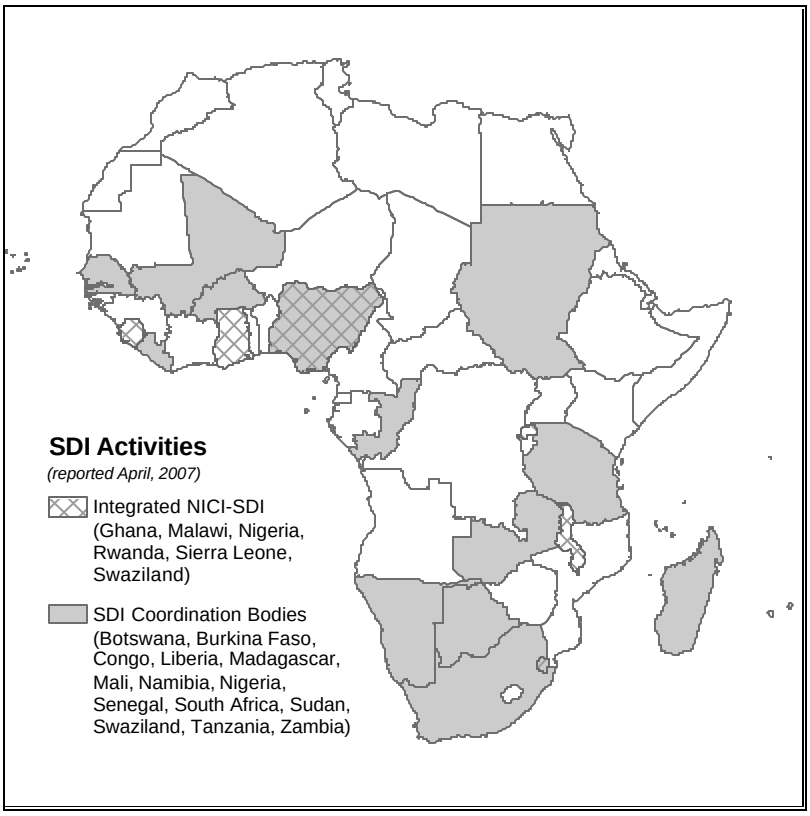
In developing NICI plans and strategies, the opportunity areas identified are specific to each country's national development priorities. Common themes usually include agriculture, education, environment, public administration, tourism, health and governance. The use of geoinformation in the formulation of strategies for these sectors gives a spatial dimension to the applications, broadens impact and allows for visual results. Above all, this generates new decision-support information. For instance, in the education sector, it is not only necessary to have information about the numbers of schools, teachers, and pupils but also to show the locations of the schools and the areas with less than optimum access. Demographic information showing the distribution of school-age children is also useful.

It is therefore of strategic importance to build a solid connection between SDI and NICI from the planning phase through to implementation and evaluation. This results in the mainstreaming of geoinformation applications in identified e-strategy areas, from the planning phase up to implementation and evaluation.

ECA has been assisting member States to develop and use NICI plans and strategies as their guiding framework for ICT development planning and project development and implementation. ECA has also been assisting countries with development of national policies on management of geoinformation as part of National Spatial Data Infrastructures (NSDI).

Recognizing the essential need for spatially referenced data and geoinformation products to support achievement of national development priorities, several member States have embraced SDIs and have established institutional and governance structures to guide the process (see figure 1.3).

Figure 1. 3: Member State SDI/NICI activities



More recent assessments of SDI progress in Africa suggest that the formulation and implementation of the initiatives is susceptible to lack of continuity and forward momentum when divorced from and pursued independently of the NICI development process. The current initiative advises member States to adopt an integrated approach when developing their national e-strategies. This is also in line with the recommendations that emanated from the Fourth Meeting of the Committee on Development Information (CODI-IV)[7], which urged that:

- Member States that had not yet started to develop SDIs and NICIs should adopt an integrated approach when developing their national e-strategies; and
- Member States that had already started SDIs and/or NICIs, should ensure that links are created between the two with sound coordinating mechanisms.

[7] Fourth Meeting of the Committee on Development Information (CODI-IV), April 2005, Addis Ababa.

To develop guidelines for the integration, six NICI countries were selected for the initial pilot. These were countries with finalized and approved NICI strategies, with the NSDI processes at varying stages and included Ghana, Malawi, Nigeria, Rwanda, Sierra Leone, and Swaziland (see figure 1.3). Representatives from these national NICI and SDI communities were invited to a four-day working session in Addis Ababa, Ethiopia, 20-23 November 2006.

As a result of this, SDI/1st NICI cycle integration efforts are underway in Sierra Leone and will be considered in the planning processes of the other countries.

1.5 Partnerships and the NICI Process

Since inception, AISI activities have been supported and implemented through a collaborative network of partners sharing the common goal of promoting connectivity and information technology development in Africa. Partnership consultation mechanisms are important as they ensure combination of the specific strengths and resources thereby building synergies and creating strong alliances to address Information Society issues effectively. A number of bilateral and multilateral partners have continued to support AISI through development of NICI policies and plans and sectoral strategies, advocacy, outreach and capacity-building activities. These include:

Finland-ECA Cooperation on ICT Development in Africa

Finland-ECA cooperation commenced in 2004 and the focus areas include the development of NICI plans in selected countries, ICT policy support to Regional Economic Communities (RECs), evaluation and monitoring of the ICT sector and its impact on the Information Society (Scan-ICT), telecommunications regulation, research and innovation, and building stakeholder networks.

ECA-EU support

The Scan-ICT programme was launched in November 2000 as a collaborative project between the Acacia Programme of the International Development Research Centre (IDRC) and ECA, with financial support from the European Union (EU) and the Norwegian Agency for Development Cooperation (NORAD). The programme monitors the penetration, impact and effectiveness of ICT applications in pilot countries across Africa thereby providing added value to AISI implementation at the national, regional and global levels. Support has also been given for development and implementation of e-strategies and regional telecommunication regulatory policies.

The Partnership for Information and Communication Technologies in Africa (PICTA)

An important vehicle for AISI partnership is the Partnership for Information and Communication Technologies in Africa (PICTA). It was formed by representatives of 17 United Nations agencies and other development agencies involved in ICT development in Africa, as the output of the donor and executing agency meeting on IT for Development in Africa, held 16 -18 April 1997, in Rabat, Morocco.

The current joint programmes include the SCAN-ICT[8] project, development and implementation of national ICT strategies, publication of a quarterly bulletin entitled iConnect Africa[9] and a monthly PICTA Bulletin[10]. PICTA members have also jointly organized conferences and meetings to promote ICT4D in Africa.

The Global ePolicy Resource Network (ePol-NET)

The Global ePolicy Resource Network (ePol-NET) was launched in December 2003 at the WSIS meeting held in Geneva. ECA is the African regional node of this network, ePol-Net Africa, in collaboration with Industry Canada and CePRC.

The Africa node has been able to provide support to countries and RECs in addressing policy issues, regulations and strategies in such areas as e-commerce, legal and policy frameworks, telecommunications policy and regulation, Internet governance, e-government and connectivity strategies.

To ensure increased commitment for African policy makers to establish strategic policy environments and effective e-policies, activities were initiated with the parliaments of the Gambia, Niger, Kenya and Swaziland. This has led to the establishment of Parliamentarian Networks. Capacity-building and awareness-raising activities for advancing access, development and implementation of ICT policies were carried out for West African Francophone countries in Dakar, Senegal (October 2005), for Central African Francophone countries in Douala, Cameroon (June 2006), and in Dakar, Senegal (October 2006).

[8] http://www.uneca.org/aisi/scanict.htm
[9] http://www.uneca.org/aisi/IConnectAfrica/index.htm
[10] http://www.uneca.org/aisi/picta/pictabulletin/index.htm

Chapter 2

The NICI Policy and Plan Development Process in Rwanda
Case Study: The Rwanda NICI Process [11]

2.0 Introduction

This chapter documents the NICI process in Rwanda. It is significant to note that the Government of Rwanda (GOR) recognized in the 1990s that ICTs could play an important role in accelerating the socio-economic development of the country and an information and knowledge economy. Rwanda is one of the first African countries to embark on a NICI process and is currently the only sub-Saharan Africa (SSA) country in the 2nd NICI cycle.

The first phase commenced in 1998 and was tabled and endorsed by H. E. President Kagame in 2000. In 2001, the 5-year plan was also tabled totaling approximately $US500 million.

Box 2.1: President Kagame on 1st NICI cycle objectives (2005)

"This year, we will be undertaking assessment of the implementation of our first NICI Plan, before we embark on the second one. The first NICI Plan (2001-2005) laid the foundation for development of Rwanda's Information Society and economy. It focused on development of human resource capacity, infrastructure, and the use of ICTs to support key sectors of the economy. The second phase (2006-2010) will lay emphasis on developing Rwanda's production capacity in ICTs as an economic sector, while at the same time emphasizing its use to develop other sectors of the economy. …."

Speech by H.E. Paul Kagame, President of the Republic of Rwanda during the African Regional Preparatory Conference of the WSIS, 2005, Accra, Ghana.

With the launching of the second ICT Policy during the 1st cycle, the expectation is that Rwanda will move from being a PAE (Predominantly Agricultural Economy) to the status of a PIKE nation (Predominantly Information and Knowledge Economy). Consequently, the role of the agriculture sector as a major contributor to the economy will be reduced from the current level of about 75 per cent to about 50 per cent by 2015 and 40 per cent of the economy by 2020. The implementation of an ICT-2020 Policy through the four NICI Plans, over twenty years, is intended to reduce the contribution of the agricultural sector to the economy gradually and increase the contribution of services and industrial sectors. The ICT production sub-sector was estimated in 2000 at about 10 per cent of the economic contribution of the industrial sector. The size of the ICT services sub-sector within the service sector is also expected to increase[12].

To realize the PIKE objectives, there are eight strategic areas of the second national ICT policy, namely, human resource development, infrastructure, e-government, community access, eeducation, defense and security, legal and regulatory issues and private sector facilitation.

[11] Professor Clement Dzidonu, Senior Research Fellow, International Institute for Information Technology (INIIT), Ghana, NICI Consultant for Ghana, Malawi, Nigeria and Rwanda.

[12] An Executive Summary, 1st NICI Cycle Plan (predefined), Government of Rwanda. , http://www.rita.gov.rw/docs/Part%200%20-%20The%20Executive%20Summary%20r4.5.doc.

In the foreword to the policy, H. E. President Kagame states that:

"Encouraging the proliferation of ICTs has given us access to an array of information and knowledge, unheard of just a couple of years ago. By spreading access to knowledge via modern communication technologies I am determined that we in Rwanda will work smarter. I am personally committed to an ICT-led future for Rwanda and I know that with good planning and sufficient resources, Rwanda can leapfrog into the digital-era global economy."

2.1 Evolution of the Rwanda NICI Process

Rwanda's NICI process commenced in 1998 as part of AISI. The process is now undergoing its 2nd NICI cycle. In line with the NICI methodology, the first phase of the 1st NICI Cycle of the Rwanda process concentrated on a comprehensive *ICT-led Integrated Socio-Economic Development Framework for Rwanda*[13] (the *Framework Document*) in 1999. This was followed by the development of an *Integrated* ICT-*led Integrated Socio-economic (ICT4D) Policy for Rwanda*[14] in 2000 aimed at facilitating the transformation of Rwanda into an information-rich, knowledge-based society and economy within twenty years.

The second phase of the 1st NICI Cycle concentrated on development of the first ICT Plan (2001 – 2005), that is, the NICI-2005 Plan, guided by the Government's ICT4D Policy and by the SUNRISE model programmes and initiatives detailed in the GOR ICT4D Policy Document. This NICI-2005 Plan (*"An Integrated ICT-led Socio-Economic Development Policy and Plan for Rwanda 2001 - 2005"*[15]), the first of four to be developed within the framework of the *Vision for Rwanda* (*VfR*) served as the cornerstone of the Government's socio-economic development plan over the period. The GOR's ICT4D Policy Document provides details of its policy commitments in relation to **what** needs to be done to realize the *VfR* through development and use of ICTs. The NICI-2005 Plan was designed to provide details of **how** these policy commitments of the Government could be translated into concrete programmes and initiatives for implementation.

The time frames of the other plans envisaged within the Policy are:

- The 2nd NICI Plan (2006 to 2010);
- The 3rd NICI Plan (2011 to 2015); and
- The 4th NICI Plan (2016 to 2020).

To facilitate the process of developing the NICI-2005 Plan, a Committee was set up by H.E. President Paul Kagame, and was tasked with its production, in collaboration with ECA.
The Plan implementation involved a number of implementation agencies from the public and private sector as well as civil establishments such as the universities and the labour unions. The implementation review of the NICI-2005 Plan was carried out in 2005 to analyse the socio-economic impact of the plan and draw lessons for subsequent NICI plans.

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[13] C.K. Dzidonu, An Integrated ICT and Socio-Economic Development Policy and Plan Development Framework for Rwanda, United Nations Economic Commission for Africa, 1999.
[14] Government of Rwanda (2000) The Integrated ICT-led Socio-Economic Development Policy and Plan for Rwanda, Government of Rwanda, 2000.
[15] Government of Rwanda (2001) An Integrated ICT -led Socio-Economic Development Policy and Plan for Rwanda 2001 - 2005, - NICI-2005 Plan, Government of Rwanda, 2001.

The Rwanda NICI process is now in its 2nd cycle, focusing on the development and implementation of the second NICI Plan – the NICI-2010 Plan. The development of this Plan was completed in the early part of 2006 and it is scheduled for implementation from 2006 to 2010. The goal of the NICI-2010 Plan is to build on the achievements of 2005 Plan and further strengthen Rwanda's economic base and improve its economic environment for accelerated growth towards achieving a predominantly information and knowledge-based economy.

Box 2.2: Target activities of the Rwandan NICI Cycles

- Moving Rwanda on the path to achieving the vision transforming the Rwandan society and economy through an ICT -led development agenda;
- Creating an enabling environment for development of the national information society and economy;
- Implementing policy initiatives and programmes to promote the information economy;
- Developing the necessary human resources to support the country's Information Society and economy;
- Promoting private sector development including targeting sectors such as services, industry and agriculture;
- Deploying and using ICTs in the educational system and in the community at large; and
- Deploying ICTs to support the operations of public services and civil society, among others.

The Rwandan NICI planning process comprises four NICI Plans, with each plan rolling into a subsequent plan. The implementation review of the NICI-2005 Plan identified a number of the rollover programmes and initiatives that were incorporated into the NICI-2010 Plan, regarded as a continuation of NICI-2005 Plan.

The NICI-2010 Plan is therefore a rollover Plan and as such, is not distinct from the NICI-2005 Plan, except for some programmed additions and corresponding plan actions for the NICI-2010 Plan.

Box 2.3: The Rwanda ICT4D Policy and NICI 2005-2010 Plan goals

- Facilitating an investment climate for the mobilization of the necessary financial and technological resources to support the deployment and use of ICTs within the economy and society;
- Developing the nation's ICT infrastructure including the telecommunication, communication and power infrastructure;
- Facilitating the participation of the private sector in development of the information economy; the development of a local ICT industry, the enactment of the necessary cyber laws and legislative provisions;
- Promoting and supporting of R&D initiatives directed at providing and using the opportunities of the Information Society and economy, and on promoting on promoting universal access to ICTs.

2.2 The Framework Document

The Framework document, *"An Integrated ICT-led Socio-Economic Development Policy and Plan Framework for Rwanda"* was developed in Phase 1 of the 1st NICI Cycle of the Rwanda process and was promulgated in 1999. The document provided an analytical basis for formulating relevant policies and plans. Specifically, the framework provided for review and analysis of the government's socio-economic development vision, policies, programmes and provisions. It also examined the general ICT landscape and infrastructure of Rwanda, the degree and level of ICT deployment, use, priorities and problem areas. The document also

served as the conceptual framework for identifying and crystallizing the immediate developmental challenges facing Rwanda and for articulating the socio-economic development vision, mission and strategy, all needed to urge policy commitment and action.

Some of the key subject areas and topics addressed to varying degrees in the document included:

- Analysis of the current socio-economic situation of Rwanda;
- Identification of the key socio-economic developmental challenges facing Rwanda;
- Review of efforts made in the past to address the identified developmental challenges;
- 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;
- Analysis of the limitations and potential for transforming the Rwandan economy and society into an information- and knowledge-based society and economy;
- Clear statement of the national vision for social and economic development and the corresponding actions for realizing the vision;
- Detailing of specific sectoral development goals for transforming the economy and society as per the stated vision, objectives and strategies;
- Identification of specific institutional arrangements and structures for facilitating the policy and plan development and implementation process; and
- Scheduling of the remaining phases of the national ICT policy and plan development process.

On the whole, phase 1 of the 1st NICI Cycle was a consultative exercise that brought on board all key stakeholders from government, the private sector and civil society. The study underlying the development of the Framework Document, apart from yielding specific deliverables was used to build national consensus and the way forward on key issues of the policy and plan. The objectives were met, of producing specific outputs and mobilizing the key stakeholders to play an active role in the consultative process leading to their development and realization.

2.3 The ICT4D Policy

The Rwanda ICT4D Policy Statement, approved by the Cabinet in 2000, was the second major deliverable of the 1st NICI Cycle in Rwanda. In this policy document, the Government recognized the role that ICTs could play in accelerating the process of socio-economic development towards 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 use of ICTs within the economy and the society. The key areas of policy commitments included:

- Creation and facilitation of an enabling environment;
- Introduction of special tax packages, instruments, and incentive programmes;
- Development and deployment of human resources;
- Facilitation of the deployment and use of ICTs in the educational system;
- Deployment and use of ICTs to support the operations of the civil and public services;
- Facilitation of an investment climate that mobilizes financial and technological resources;

- Encouragement and facilitation of physical infrastructure development;
- Development of standards, best practices and guidelines to guide ICT deployment and use;
- Creation of the necessary enabling regulatory framework for facilitating access to and use of ICT products, services and systems;
- Enactment of the necessary cyber laws and legislative provisions;
- Setting up of national ICT structures and bodies;
- Facilitation and promotion of national ICT applications;
- Integration of gender-sensitivity elements into national information and communication programmes;
- Promotion of universal access to ICTs;
- Development of a local ICT industry;
- Facilitation of the role and participation of the private sector in development of the information economy;
- Promotion and support of research and development (R&D) initiatives directed at enhancing capability to use of the opportunities offered by the information society and economy; and
- Involvement of all key national stakeholders, including civil society, in the process.

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As a key aspect of its ICT Policy and Strategy for developing the Rwandan information society and economy, the GOR was committed to set up and implement four 5-year NICI Plans (NICI I, II, III and IV) over the 20-year time span of the Vision 2020 socio-economic development programme.

2.4 The NICI 2005 Plan

Phase 3 of the 1st NICI Cycle of the Rwandan process concentrated on development of the first of the four 5-year NICI Plans (NICI-2005 Plan) for implementing the GOR policy commitments as contained in the Policy Document.

The SUNRISE model

A key output of phase 1 as documented in the Framework Document is the SUNRISE Model, developed as part of the integrated framework for guiding development of the first five-year NICI Plan (NICI-2005 Plan). The model provided a framework for identifying and incorporating, suitable programmes, projects and initiatives into the Plan, 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 use; and
E: Legal regulatory and institutional frameworks.

It was envisaged that the SUNRISE model would be modified on the basis of the implementation outcomes of the NICI-2005 Plan, thus serving as a blueprint for developing subsequent NICI plans within the time frame of the Rwandan Vision 2020.

Pillars of the NICI-2005 Plan

The NICI-2005 Plan[16] process resulted in a number of drafts that were subjected to a series of consultative meetings and dialogue with Ministers and other key stakeholders from the public and private sectors. Public seminars were also held to solicit inputs from key interest groups and stakeholders. It was developed as an integrated ICT-led socio-economic development plan based on eight pillars as illustrated in figure 2.1.

Figure 2.1: Pillars of the NICI-2005

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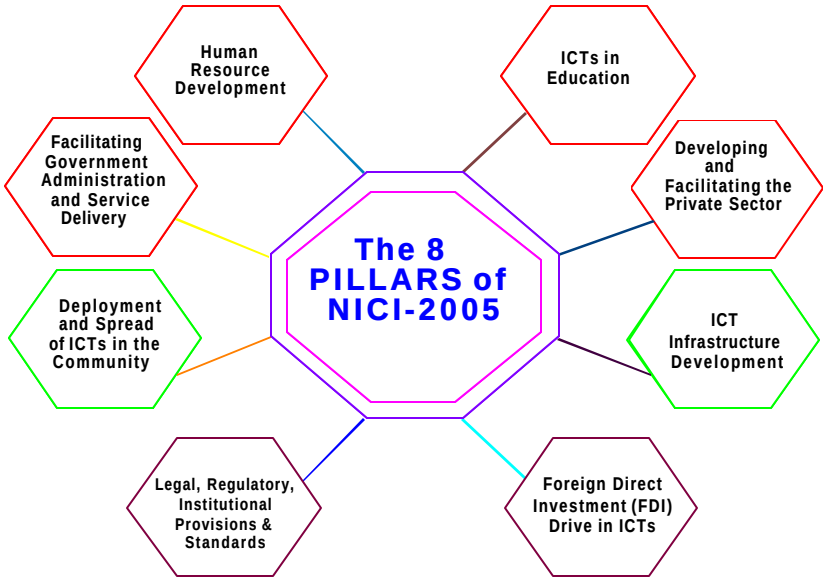


Each of the pillars comprised a number of programmes and initiatives. For example, as shown in table 2.1, the Human Resource Development (HRD) element was made up of 13 programmes and initiatives. Each of the programmes and initiatives in turn comprised a number of plan-specific actions with time-bound measurable (TBM) targets.

[16] Government of Rwanda (2006). An Integrated ICT-led Socio-Economic Development Policy and Plan for Rwanda 2006 – 2010, - the NICI -2010 Plan.

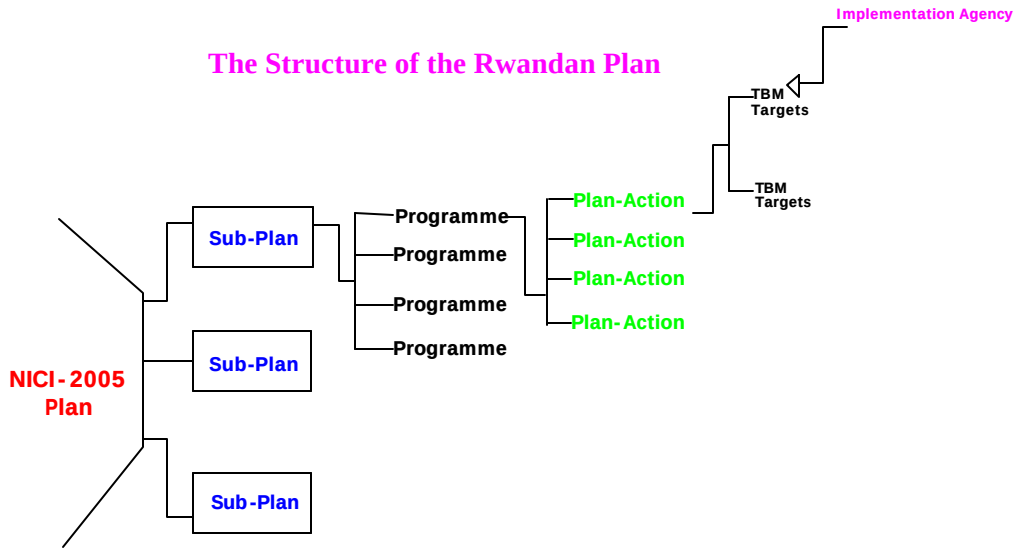
Table 2.1: NICI – 2005: Summary Statistics

NICI-2005 Plan: Summary Statistics

Sub-Programme	Programmes & Initiative	Plan-Specific Actions	TBMS
HRD	13	41	71
EDUC	11	52	85
GOV	8	39	55
PRS	9	42	53
CMN	6	34	74
IFR	3	14	23
LRI	4	21	24
FDI	5	22	34
TOTAL	**59**	**265**	**419**

The structure of the NICI-2005 Plan (table 2.1) is a combination of the eight *Sub-Plans* that represent the 8 pillars of the Plan. Each had a portfolio of *programmes* to which was associated a number of action plans, with corresponding specific TBMs targets and implementation agencies.

Figure 2.2: Structure of the Rwandan Plan



2.5 The Baseline Study to Guide Plan Formulation

To develop a realistic plan whose programmes, initiatives, projects and targets were relevant and took into account the current status of key socio-economic and ICT-related indicators, a baseline study was conducted prior to formulation of the NICI-2005 Plan.

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 the basis for the plan projections and targets. The objective of the study was not to conduct a comprehensive national survey within the economy and society but to conduct a focused study concentrating on establishing the status of a number of key indicators that relate more specifically to the Government's ICT policy commitments on which the Plan was to be based. The study drew on both primary and secondary sources of data. Some of the key indicators targeted included:

- The economy (focusing on key socio-economic indicators);
- Level of ICT use and deployment in key sectors of the economy, including the:
    - Private sector;
    - Civil and public service;
    - Agricultural sector;
    - Industrial sector;
    - Service sector; and
    - Education, health and other 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:
    - Physical infrastructure (transport, electricity, etc.);
    - Telecommunications and Internet infrastructure;
    - Communications and the mass media infrastructure; and
- Others.

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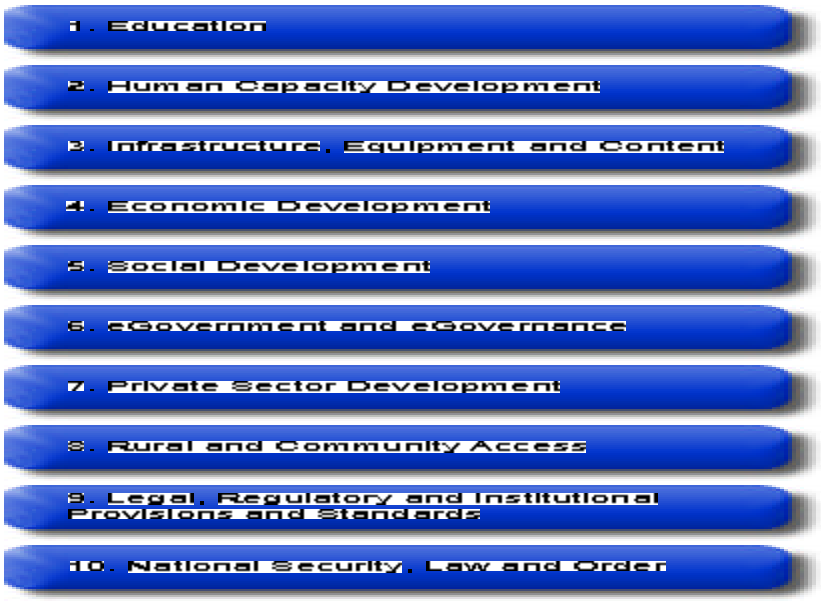
2.6 The NICI-2010 Plan

The development of the NICI-2010 Plan, as was the case with the NICI-2005 Plan, was developed through a series of consultative and stakeholder meetings organized before the final draft was completed and submitted to the Cabinet. Again, as in the case of the NICI-2005 Plan, a National Task Force with a multi-stakeholder membership coordinated the plan development process and ensured that all key stakeholders participated in and contributed to development of the details of the Plan. A number of Ministerial Plan Action Committees and Cluster Working Groups were set up under the auspices of the Task Force to facilitate across-the-board involvement at the ministerial level of government and at the sector level.

The NICI-2010 Plan is made up of 10 pillars as shown below (figure 2.3), each with corresponding actions, as was the case with the NICI-2005 Plan.

Figure 2.3: Pillars of the NICI-2010 Plan



For each of these, the selected *VfR* missions were documented including the relevant ICT4D policy commitments of the Government and the ICT4D policy expectations. The planned actions designed for achieving the Government's ICT4D policy intentions and commitments were also documented for each. Each of these planned actions had a due date or TBM associated with it. To complete the process, corresponding implementation agencies were identified for each of the planned-actions. Also documented for each of the planned actions was an indication of its relation to a particular rollover planned action. Some of the NICI-2010 planned actions were completely new, whilst a number corresponded to implementation of a rollover item from the NICI-2005 Plan. A number of these NICI-2010 tasks are described as either *equivalent* or *correspond* to a particular NICI-2005 rollover task or represent an aspect of a particular rollover task.

The implementation and coordination structures

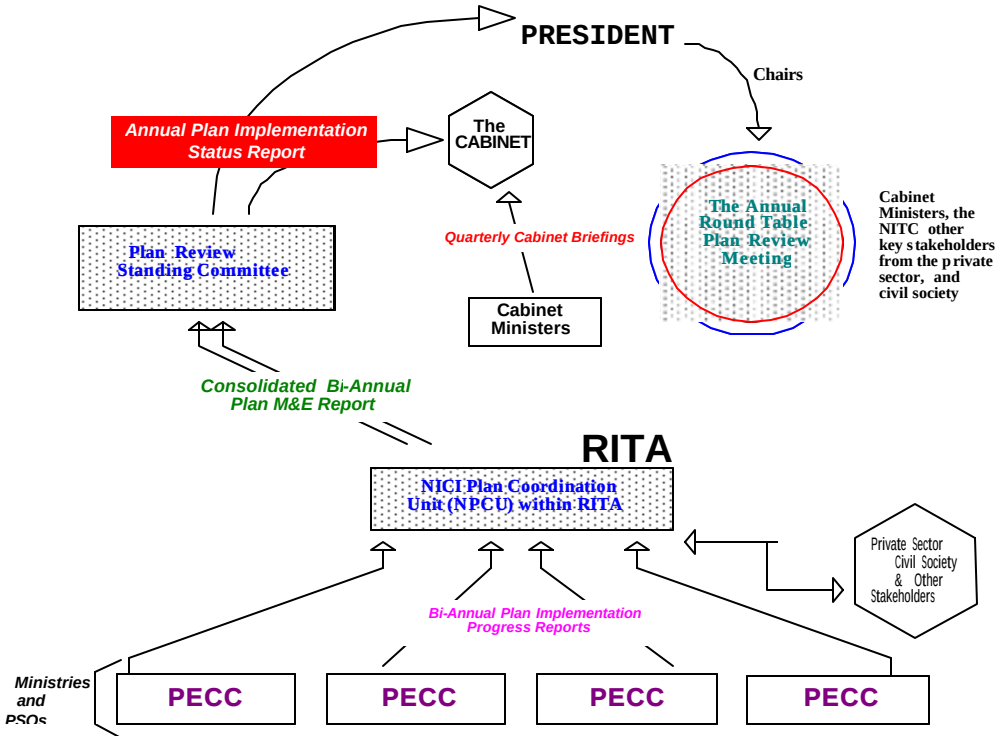
The Rwanda NICI process yielded some key structures for supporting and coordinating the policy and plan development and implementation process. A number of these were identified during the first phase of the 1st NICI Cycle and documented in the Framework Document. The key ones were the National Information Technology Commission (NITC), the Rwanda Information Technology Authority (RITA) and the Plan Execution and Coordination Committees (PECCs). These were to be established in the various implementation agencies such as in the Government Ministries and other public sector organizations (PSOs) identified as the actors implementing the various programmes of the Plan. RITA has now been established and the Ministries and the PSOs currently have their PECCs in place.

Plan implementation monitoring and evaluation mechanism

Another key aspect of the Rwanda NICI process was incorporation of a *Programme Monitoring, Evaluation and Reporting Mechanism* within the NICI-2005 and the NICI-2010 Plans and their implementation. This mechanism as illustrated in figure 2.4 allows for appropriate intervention procedures and actions with clear guidelines on how and when these should be activated and by which agency or authority.

Forming a key component of plan implementation, the framework illustrated facilitates and coordinates an enforceable bottom-up monitoring and evaluation mechanism and reporting procedure involving a number of key players, namely, PECCs of the Ministries and the PSOs, RITA's NPCU and the PRSC. Also playing a key role in this process is the Round Table Plan Review Meeting convened annually and chaired by H.E. the President, – the national ICT champion.

Figure 2.4: Plan Implementation Monitoring and Evaluation Framework



2.7 Stakeholder involvement in the Rwanda NICI process

The consultative process of the underlying activities of the 1st and 2nd NICI Cycles was extensive and involved all key stakeholders from the public and the private sectors. Both

NICI cycles involved consultative meetings and dialogue with Ministries and PSOs as key players.

In the case of the 1st NICI Cycle, following stakeholder workshop held at the beginning of the Rwanda NICI process in 1998, a series of consultative meetings were held with respective Ministries and other PSOs to solicit their inputs into development of the Framework document. Various key Cabinet Ministers and heads of institutions and other senior government officials were engaged on a one-on-one basis. At these meetings, views were expressed in relation to the developmental challenges facing Rwanda and on what steps needed to be taken in the various sectors of the economy to enable the country to embark on an ICT-led development agenda. Consultative meetings were also held with key members of civil society and with key players in the private sector, including in the ICT industry.

After ECA submitted the Framework document to the GOR in 1999, a high-powered Ministerial half-day consultative meeting was convened, chaired by H. E. President Kagame (then the Vice-President) to discuss and deliberate on the details of the document and chart the next steps. The meeting was attended by the entire Cabinet, Governors of Provinces, the leadership of the Rwanda Parliament, the judiciary, heads of universities and colleges and private sector champions of industry and commerce.

The development of the ICT4D Policy document, and later, the NICI-2005 Plan and the NICI-2010 Plan, also involved a series of consultative meetings with key stakeholders. The ICT4D Policy document was debated in Cabinet before its final approval. The NICI-2005 Plan and the NICI-2010 Plan were also discussed and approved by the Cabinet before official public launch at a high-powered ministerial level meeting chaired by the President in 2001.

2.8 The NICI process: key challenges

The challenges that Rwanda faced with the NICI deliverables, namely the Policy document and the NICI Plans, were mainly experienced during the early years of the process. At the time, not many African countries were involved and because Rwanda was of the first, it faced some challenges in terms of educating and sensitizing the public and key stakeholders on the need to embark on an ICT-led development agenda. Given the President's strong leadership and championship of the NICI process Rwanda eventually fully embraced the vision of transformation into an information-rich, knowledge-based society and economy through the modernization of its key sectors using ICTs.

On the whole, the key challenges of the 1st ICI Cycle of the Rwanda process related mainly to implementation. During the review of its implementation, a number of key challenges were identified:

Resource mobilization

The difficulty in mobilizing funds and the consequent lack of technical resources for implementing some of the programmes and initiatives was highlighted. As per the provisions of the Plan, in addition to mobilizing funds and resources to implement its major programmes and initiatives, each implementation agency, depending on size and operations, was to set aside (during the time frame of NICI-2005) 5 – 10 per cent of its annual budget as an ICT budget. This was meant to support programme implementation including meeting the costs of procuring IT products, services and training. A number of the implementation agencies

indicated during the review of the implementation of their NICI-2005 Plan components that they were unable to meet the budgetary target stipulated. A number of these agencies, both public and private, confirmed that the financial resources they managed to mobilize came from both government and donor sources.

Expertise availability

Another challenge faced by Rwanda during the implementation of the NICI-2005 Plan was lack of expertise and difficulty in recruiting the right technical and other professional personnel. This lack of the requisite qualified human resources and expertise especially in the public sector, at the start of the process was traced principally to the consequences of the 1994 genocide and this is well documented.

Furthermore, some agencies faced difficulties in understanding some of their assignments. For the vast majority, the problem was not knowing what to do, but rather, how to mobilize the financial and technical resources and expertise required for implementation

Plan implementation support and coordination

Plan implementation support and coordination was also identified as a problem area during the NICI-2005 Plan implementation. Lack of institutional, logistical and technical support for the implementation agencies was cited as a major challenge. This related to structures and mechanisms for supporting the Plan and for facilitating monitoring and evaluation (M&E).

A number of these challenges still needed to be addressed within the NICI-2010 Plan implementation. The GOR has already directed efforts towards this. For example, RITA capacity has been strengthened to enable coordination of the implementation process. The technical capacity of the implementation agencies, particularly Ministries and PSOs has also been strengthened through various capacity-building programmes. Training programmes have also produced much of the human resources required for implementation of the programmes and initiatives of the NICI-2010 Plan.

2.9 The Rwanda NICI process: key lessons

The Rwanda NICI process, being one of the first to start in Africa and judged as one of the most successful, does have a number of key lessons for other African countries:

- The need for high-level political championship of the process if it is to succeed. The key role that the President of Rwanda played in supporting the Rwanda NICI process has been acknowledged worldwide. It has been recognized that without this highest level of support and championship, the success achieved by Rwanda in its NICI process in a relatively short space of time would not have been possible;

- Resource mobilization to implement the policy and the plan is crucial if a high proportion of the initiatives and projects identified are to succeed. The resource mobilization challenges faced by Rwanda contributed to rollover of a number of the NICI-2005 programmes and initiatives into the subsequent the NICI-2010 Plan;

- Stakeholder participation in the policy and plan development process is crucial for ensuring buy-in and acceptance of the need to pursue an ICT4D development agenda. The

involvement of key Ministers and principal public and private sector stakeholders facilitated consultation and across-the-board contributions. This is a prerequisite for successful delivery of the desired goals; and

- A clear vision, mission, and strategy and well-scheduled, step-by-step approach with specific milestones and expected outputs are crucial.

2.10 Conclusion

The Rwanda NICI process yielded one of the most comprehensive and integrated ICT4D Policy and Plans in Africa. The process borrowed some concepts from the Mauritius process, which in turn was based on Singapore's experience. Rwanda's became one of the most innovative in Africa and one of the most integrated into national socio-economic policy and planning. It is also one of the countries with the highest top-level government support for the process and its ICT success story is often attributed to the direct role played by the President in providing personal leadership. A number of African countries are learning from the Rwandan experience in developing their own ICT policies and plans.

The success of the Rwanda process can be attributed to a number of critical success factors and conditions (CSFCs) including:

- Top level political leadership support and commitment to the process;
- Clear vision, mission and strategy statements to guide the process outputs;
- Adoption of a well-scheduled, step-by-step approach with specific milestones and deliverables;
- Well researched exercises that made an effort to learn from the experiences of a number of countries;
- Presence of an active national ICT champion - the President;
- Involvement of key Ministers as well as principal public and private sector stakeholders in the process thus facilitating consultation and across-the-board contribution to the process and its deliverables;
- Continuous dialogue among key stakeholders, namely, government, private sector and civil society; and
- Excellent logistics support and facilitation on the part of ECA.

Appendix A is an illustration of Rwanda's performance on each of the CSFC identified above, based on the implementation review of the NICI-2005 Plan[17]. For each identified CSFC, a specific assessment is made of the extent to which it has been addressed by the activities and deliverables of the 1st NICI Cycle.

[17] C.K Dzidonu et al, (2006), A Review of the Implementation of the Rwanda ICT4D/NICI-2005 Plan: The Key Achievements, Lessons and Challenges, Rwanda Information Technology Authority (RITA), Government of Rwanda, 2006.

Chapter 3

NICI Policy and Plan Development in Africa
Case studies: Ghana, Nigeria and Malawi

3.0 The Ghana NICI Process

The Ghana NICI process commenced in earnest after the Government set up the National ICT Policy and Plan Development Committee in August 2002 to guide the process, led by the Ministry of Communication and Information Technology. A Task Force known as the National ICT Policy and Plan Development Committee was established to advance the policy process and guide production of the framework, policy and plan documents for an integrated ICT-led socio-economic development programme.

Furthermore, extensive stakeholder consultative meetings and public forums were held in each capital city in the country, starting from September 2001 until December 2003. These gatherings proved to be successful and received positive and encouraging feedback with requests for further meetings. For example, the meeting with the group of Paramount Chiefs from the Eastern Region resulted in a request by the President of the National House of Chiefs for consultations with the entire National House of Chiefs. The meeting with the Private Sector Foundation led to another session with representatives of key private sector associations and groups. In addition, as a result of a meeting with the Parliamentary Select Committee on Communications, a decision was made for a briefing to Parliament on the NICI process as a whole. These examples clearly demonstrate how the timing of consultation meetings can foster the growing interest among key stakeholders. In addition, the NICI Committee commissioned a video production of the consultation process, which has since been forwarded to the European Commission.

Box 3.1: President Kufour on the status of Ghana's NICI process

"Ghana's experience has already shown us how the tools provided by ICT can dramatically improve and enrich our way of life both at the individual and societal levels. Here in Ghana, efforts are afoot to deploy ICT within the economy and society as a whole. After an extensive nation-wide consultative process, government has developed the 'Ghana ICT for Accelerated Development Policy' to serve as a roadmap for the development of Ghana's information society and economy…."

Address at the Opening Ceremony of the Second Preparatory Conference on the World Summit on the Information Society (WSIS) by H.E. John Agyekum Kufuor, President of the Republic of Ghana, Accra, Ghana 2-4 February 2005.

The NICI process was based on the ECA-NICI methodology and implemented in three phases:

- Phase 1: Development of the Framework Document;
- Phase 2: Development of the Policy Document; and
- Phase 3: Development of the Plan.

Phases 1 and 2 of the process constituting the 1st NICI Cycle of the Ghana process are now completed.

The key deliverables of the Ghana NICI process

The key deliverables of the Ghana's 1st NICI Cycle included:

- The Framework Document;
- The ICT4AD Policy Document;
- The Sector-Specific Implementation Strategies;
- The Ministerial ICT Policy Statements;
- The NICI Plan - the ICT4AD-2010 Plan (currently being developed); and
- The structures for facilitating the policy and plan implementation process.

The Framework Document

The Ghana NICI Framework Document, *"An Integrated ICT Policy and Plan Development Framework for Ghana"*[18] (2003) was the first key output of the Ghana NICI process. The document provided an analysis of Ghana's socio-economic development landscape, identified the key developmental challenges facing the country and analysed the potential for pursuing an ICT-led socio-economic development plan.

Volume I of the Framework Document addressed the question: *"Where are we as a Nation?"* in terms of Ghana's performance based on a number of key social and economic indicators it also addressed the question: *"Where do we want to get to as a Nation?"* The latter concentrated on issues relating to the ICT4AD process. This question was further taken up in Volume II of the Framework Document.

Research conducted

The Framework Document was based on detailed research, including a number of studies conducted by the Technical Support Team of the Committee. The Technical Reports produced are available at www.ict.gov.gh. The list includes:

- A survey of ICT deployment and use in Government Ministries and public sector organizations;
- A survey of ongoing ICT projects and initiatives in Government Ministries and public sector organizations;
- Analysis and summary of the results of the 'On-the-Spot' questionnaire compiled during the national consultative exercise;
- A report of the meetings, dialogue sessions and the public forums of the national consultative exercise;

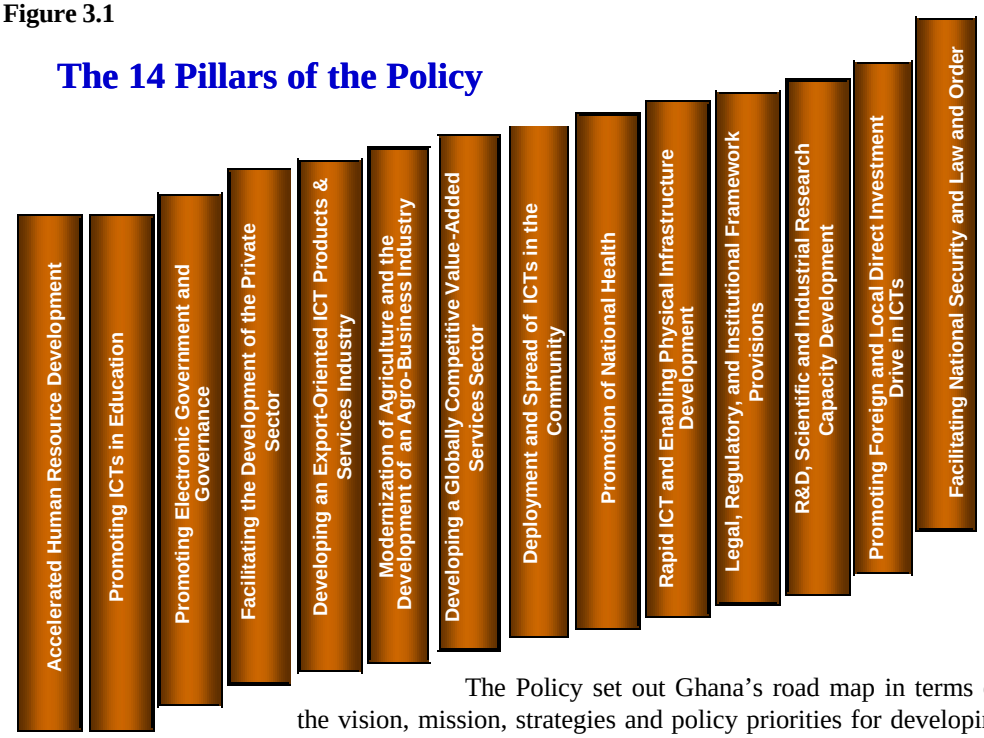
[18] C.K. Dzidonu, An Integrated ICT for Accelerated Development Policy and Plan Framework for Ghana, Volumes I and II, United Nations Economic Commission for Africa (UNECA), 2003.

- Compilation of ICT-related projects and initiatives by donor and United Nations Agencies in Ghana;
- A survey of ICT Deployment and Use in the Educational System; and
- A status report on Ghana's human resource development (HRD) and R&D capacity.

The Policy Document

The Ghana ICT4AD Policy Statement[19] is based on 14 pillars (see figure 3.1) that set the priority policy focus areas and define the country's ICT-driven development agenda in the information and digital age. It represents the national statement on the plans to address the challenges and socio-economic implications of the digital divide.

Figure 3.1

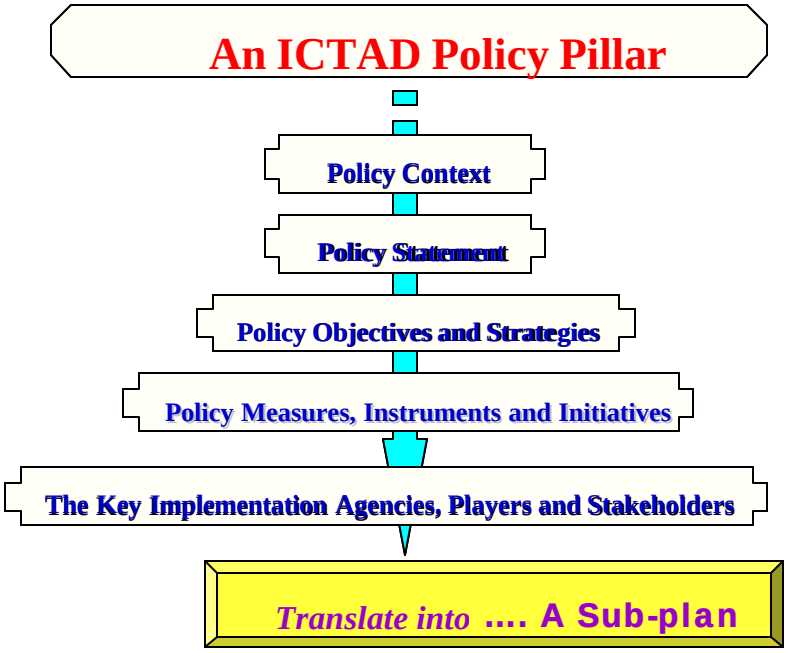


The Policy set out Ghana's road map in terms of the vision, mission, strategies and policy priorities for developing Ghana's information society and economy. The ultimate objective is to accelerate Ghana's socio-economic transformation in the digital age into a high-income economy and society that is predominately information-rich and knowledge-based, within the next two to three decades or less.

[19] Government of Ghana, 2003, The Ghana ICT for Accelerated Development Policy Statement, Government of Ghana, 2003.

Each focus area represents a pillar of the Policy as illustrated in figure 3.2.

Figure 3.2: Pillar policy context



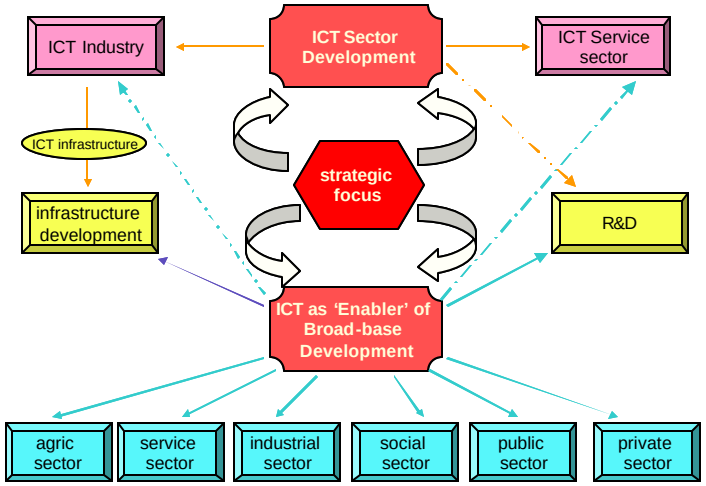
The key drivers of the Ghana ICT4AD Policy approached ICT as:

- A social-enabler (education, health, poverty-reduction, income-distribution);
- An enabler of rapid socio-economic development;
- An enabler of government administration and service delivery;
- A facilitator of e-government and e-commerce initiatives;
- An engine of the service sector;
- An enabler of knowledge-driven industrial development;
- An enabler of the agriculture sector;
- A driver of private sector development;
- An agent for wealth creation; and
- A tool for bridging the gender inequality gap in social, economic and political development.

A dual focus

As illustrated in figure 3.3, the Ghana ICT4AD Policy has a strategic dual focus, development of the ICT sector and industry and use of ICTs as the broad-based enabler of developmental goals. Emphasis on the development, deployment and use of ICTs is meant to aid all other sectors of the economy to take full advantage of the opportunities of the information age and develop a vibrant information- and knowledge-based economy that is not just a consumer of ICT goods and services but is also a producer and developer of ICT products and services.

Figure 3.3: Dual focus of the Ghana ICT4AD policy



The Government is committed to development of a local ICT production industry and service sector and to deployment and use of ICTs to support various other sectors of the economy and society.

Sector-specific implementation strategies

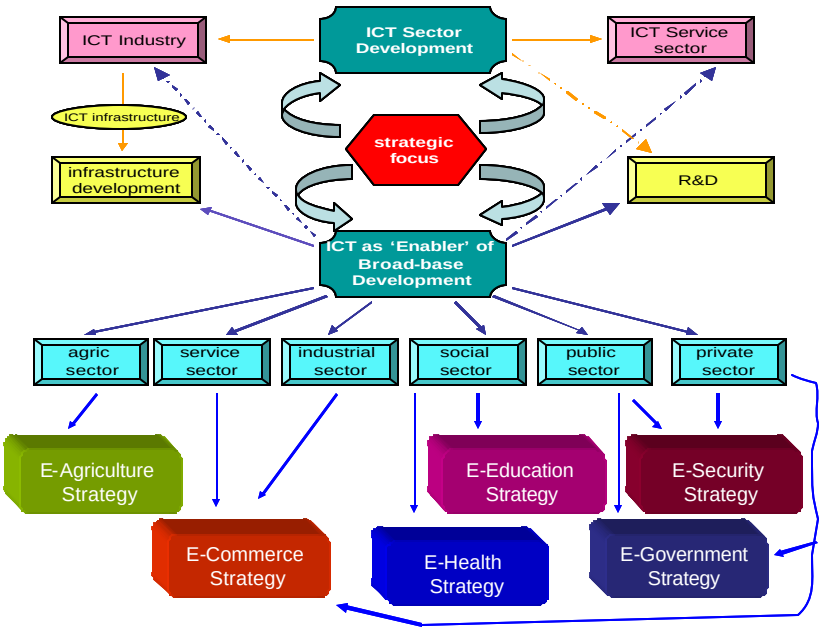
The ICT4AD Policy Statement recognized the need to develop a number of sector-specific action plans to implement the provisions of the Policy. The Government, acknowledging this need, and as part of the broad ICT objectives, developed the following sector-specific ICT implementation strategies set within the wider provisions of the national ICT4AD Policy Statement:

- The e-Commerce and Trade Development Strategy;
- The e-Government and Governance Strategy;
- The Telecommunication and Communications Sector Policy Statement;

- The National ICTs in Education Strategy;
- The National ICTs in Agriculture Strategy;
- The National ICTs in Health Strategy;
- National Strategy on ICTs and Gender; and
- National e-Security Strategy.

The link between some of these sectoral implementation strategies and the key sectors of focus of the Ghana ICT4AD Policy Statement is illustrated in figure 3.4.

Figure 3.4: Sectoral strategy and sector linkages



The Ministerial ICT Policy Statement

The ICT Policy Statements for each Ministry and PSO was set within the wider framework of the Policy Statement. The Ministerial Policy Statements were designed to foster ownership of the implementation process within the Ministries and PSOs. Each provided details of how a given Ministry or PSO planned to mainstream the provisions of the ICT4D Policy into its programmes, activities and priorities. Specifically, each agency-specific ICT Policy Statement incorporated:

- Vision and Mission Statements of the Ministry/PSO or Regional Coordinating Council (RCC) of each of the ten regions set within the context of the national Policy Statement;

- Broad strategies to be pursued by the Ministry/PSO/RCC to realize its vision and mission statements;
- Specific ICT policy goals of the Ministry/PSO/RCC for the deployment and use of ICTs to support its aims and activities;
- Statements on the key areas of commitment of the Ministry/PSO/RCC for deployment and use of ICTs in specific areas of its strategic goals, operations and/or service delivery; and
- Statements relating to the focus of the ICT programmes and initiatives of the respective Ministry/PSO/RCC.

The ICT4AD-2010 Action Plan

Since the approval the ICT4AD Policy, a number of flagship ICT programmes, initiatives and projects have been implemented in the areas of e-education, e-government, community-based ICT initiatives and nation-wide ICT infrastructure rollout including the implementation of a national fibre backbone initiative. As part of the provisions of the policy, an enabling legal and regulatory environment to support the development of Ghana's Information Society and economy has been facilitated. Notable initiatives in this area included preparation of a number of bills that are currently before the Parliament.

Ghana is in the process of developing the first of the four-yearly NICI Plans planned 15 to 20 year time-span of the ICT4AD Policy. The ICT4AD-2010 has an implementation time-span of 2007-2010 and comprises the followings:

- E-Government - for facilitating government administration and service delivery, including the promotion of e-government and e-governance initiatives;

- Accelerated Human Development - for promoting human resource development that targets the key skill areas necessary for developing Ghana's information and knowledge economy and society;

- E-Education - for promoting ICTs in education targeting all levels of the educational system from primary to university level;

- Private Sector Development - for supporting the private sector by promoting the use of ICTs to strengthen its activities especially in such key economic sectors as agriculture, services and industry;

- E-Commerce Development - for targeting the development of e-commerce services and products and ICT services/ITES in Ghana;

- ICTs-in-Community - targeting at programmes and initiatives that foster the rapid deployment of ICTs within the community to promote universal ICT access;

- E-Health - for facilitating deployment and use of ICTs to facilitate health care delivery in Ghana;

- ICT and Physical Infrastructure Development and Rollout - for facilitating infrastructure development for telecommunications and communications;

- Legal, Regulatory, Institutional Provisions and Standards - for building the necessary legal and regulatory environment needed for enhancing use of ICTs within the economy and society;

- Industrial, Scientific Research, R&D Promotion - for facilitating and promoting industrial and scientific research as well as R&D to develop other key sectors of the economy including fast-tracking development of Ghana's capacity to deliver ICT goods and services, that is, the development of an ICT production industry in Ghana;

- FDI Drive in ICTs - for targeting promotion of ICT-related FDI to support development of the national ICT industry and sector needed for an information and knowledge economy and society; and

- E-Security - for addressing national security and law and order issues.

It is envisaged that the Ghana ICT4AD-2010 Plan would, apart from detailing the programmes and initiatives coming under each sub-plan, also mainstream a number of the ongoing initiatives and projects as part of the provisions of the ICT4AD Policy Statement.

Stakeholder involvement

The National ICT Policy and Plan Development Committee conducted a series of consultative meetings with key stakeholders during each phase of the 1st NICI Cycle in Ghana.

The Framework Document Development Consultative Process

The development of the Framework Document was based on a nation-wide consultative exercise undertaken by the National ICT Policy and Plan Development Committee. This involved public meetings and forums, meetings with public and private sector organizations and other key stakeholders on a one-on-one basis throughout the country. Over 60 organizations took part in the consultative process that covered all the 10 regions of the country over a period of 10 months.

As part of the consultative process, a number of Cabinet Ministers contributed individually and there were also stakeholder meetings with the Parliamentary Select Committee on Communications, the Council of State, the National House of Chiefs, Regional Coordinating Councils, Universities, Polytechnics, Schools, the Security Agencies, Private Sector

Associations and establishments, Chambers of Commerce and Industry, Ministries, the State Enterprise Commission, PSOs, Telecommunication Operators, institutional service providers (ISPs) and other companies, civil society including women's groups, and many others. See (www.ict.gov.gh for the full list of stakeholders who participated in the consultative process). A video documentary also recorded the consultative process.

The Policy Statement Development Stakeholder Consultative Process

As in the case of the development of the Framework document, the Policy Document also went through a national consultative exercise involving key stakeholders from all sectors. The Ministry of Communications and the National ICT Policy and Plan Development Committee organized stakeholder draft policy consultative meetings. The Minister for Communications distributed the Draft Policy to various key stakeholder organizations for comments, including the Council for Scientific and Industrial Research (CSIR), the Ghana Institution of Engineers, and the Ghana Academy of Arts and Sciences, among others. A Technical Team was also co-opted by the Minister of Communications to review the draft policy document independently. This team proposed a number of recommendations and amendments which were examined and incorporated into the policy draft. The revised policy draft was discussed at the following stakeholder meetings:

- The Parliamentary Select Committee on Communications attended by MPs from all the major political parties;

- Special Cabinet Briefing Session on the Policy attended by the Vice-President, the Senior Minister and other Ministers, and Deputy Ministers; and

- Half-day National Stakeholder Meeting attended by over 400 delegates representing major public and private sector organizations and establishments from all over the country.

The final draft of the Policy was presented to the Cabinet by the Minister of Communications in November 2003 and was approved with some minor amendments incorporated in the final Policy Document. This document also received parliamentary approval.

Developing Sectoral Strategies

Sectoral Strategies also developed from stakeholder meetings and consultations. The National ICT Policy and Plan Development Committee set up Technical Sub-Committees each charged with responsibility for development of Sector-Specific Implementation Strategies. The work of each of these sub-committees was facilitated by a resource person who prepared the various drafts of the relevant Sectoral Strategy, which provided the basis for stakeholder consultations within the Technical Sub-Committee and in the relevant sector as a whole.

Developing the Ministerial ICT Policy Statements

The development of the Ministerial Policy Statement by each Ministry and PSO also went through a consultative process. Each Ministry used a template that required internal consultation within the respective sector to develop a Ministerial Policy Statement based on the provisions of the National ICT4D Policy Statement. This process was preceded by a meeting under the auspices of the Office of the Head of the Civil Service on how each Ministry was to develop its Statement.

The Draft Statement for each Ministry was submitted to a peer review process at a national workshop attended by representatives from each participating Ministry. Comments, observations and suggested amendments and improvements resulting from the peer review were then incorporated into the draft by the respective Ministry to arrive at the final document.

Developing the ICT4AD-2010 Plan

The Ghana NICI (ICT4AD-2010) Plan development is currently ongoing under the auspices of the National ICT Policy and Plan Development Committee. The process has engaged a number of resource persons to prepare drafts of each of the 14 sub-plans, which then have to be subjected to a series of technical review meetings attended by members of the Committee, key stakeholders and domain experts. The resource persons have also been conducting meetings with relevant stakeholders and organizations to facilitate their inputs into the drafts of the sub-plans. National stakeholder workshops and round-table meetings to deliberate on the consolidated Plan before its finalization and submission to the Cabinet are scheduled for 2007.

3.1 Evolution of the Nigeria NICI Process

Nigeria commenced its NICI process in 1999 soon after the Africa Development Forum (ADF'99)[20] event. Nigeria is currently operating within the framework of its 1st NICI Cycle. In 2000, the country developed its National Information Technology (IT) policy, with the vision of making Nigeria an IT-capable country and a key player in the global and African Information Society, by using IT as an engine for sustainable development and global competitiveness.

Unlike the case of Rwanda, the Nigerian IT Policy Document was not preceded by a Framework Document as per the NICI methodology. However, the IT Policy documented a number of the key issues normally addressed in a NICI Framework Document. For example, sections of the Policy Document made the case for the need for Nigeria to embark on developing its IT sector and industry to facilitate its socio-economic development. Emphasis

[20] Africa Development Forum held in Addis Ababa, Ethiopia, 24-28 October 1999, on the theme "The Challenge to Africa of Globalization and the Information Age" http://www.uneca.org/adf99/adf99m.htm

was also placed on the need for Nigeria to embark on a socio-economic development programme that was IT-led.

On the whole, the Government has recognized IT as a strategic imperative for national development and resolved to provide considerable national resources, financial and other, for realization of the national IT vision statement.

Following approval of the Policy Document in 2002, the Nigeria Information Technology Development Agency (NITDA) was established to serve as a national agency for coordinating Nigeria's ICT4D initiatives and efforts. Establishment of NITDA was one of the key provisions of the Policy Document. NITDA, working with key stakeholders in the public and private sectors as well as with civil society, provided leadership in implementing the IT Policy Document. It is currently coordinating national efforts to develop the Strategic Action (NICI) Plan. Nigeria had begun implementation of the provisions of the Policy Document without a detailed NICI Plan. This was possible because the Nigerian Policy Document identified action-oriented policy measures for each policy provision.

Key deliverables of the Nigerian NICI process

The two key deliverables of the Nigerian NICI process were the National IT Policy (completed and approved by the Government in 2000) and the National ICT4D Strategic Action Plan (currently being developed and at an advanced stage).

The National IT Policy

The Nigerian National IT Policy[21] identified such strategic areas for action as: Human Resource Development; Infrastructure Development; Governance; R&D; Health; Agriculture; Urban and Rural Development; Trade and Commerce; Fiscal Measures; Government and Private Sector Partnerships; Arts, Culture and Tourism; National Security and Law Enforcement; Legislation; and IT Popularization and Awareness.

Some of the specific strategies targeted for implementation include:

- Establishing a coordinated programme for the development of a national, state and local information infrastructural backbone by using emerging technologies, such as satellite including VSAT, fibre optic networks, high-speed gateways and broad band/multimedia;
- Increasing the telephone line penetration rate by expanding the existing telecommunication network and providing new networks using modern technologies in that to minimize the cost of expansion;

[21] The Nigerian National Information Technology (IT) Policy, Government of the Federal Republic of Nigeria, 2001.

- Encouraging further deregulation of the telecommunication industry with a view to providing affordable, competitively priced Internet connectivity for a larger community of users;
- Restructuring the educational system at all levels with a view to developing relevant IT curricula for primary, secondary and tertiary institutions in order to respond effectively to the challenges of the information age and, in addition to this, allocating an IT development fund to education;
- Developing government/private sector R&D partnerships through equitable facilities sharing and by establishing pilot schemes in software and hardware development within as well as outside designated IT parks;
- Establishing and operating IT zones also known as IT parks to attract IT investment;
- Encouraging massive local and global IT skills acquisitions through training in the public and private sectors, as well as through joint ventures and alliances, to achieve a strategic medium-term milestone of at least 500,000 skilled IT personnel by year 2003;
- Bringing government services to the doorsteps of the people by creating virtual forums and facilities to strengthen access to government information and interaction between the governed and government, which lead to greater transparency, accountability and democracy; and
- Establishing NITDA to implement, monitor, evaluate, regulate and verify IT activities on an ongoing basis, under the supervision of the Federal Ministry of Science and Technology.

The National Strategic Plan

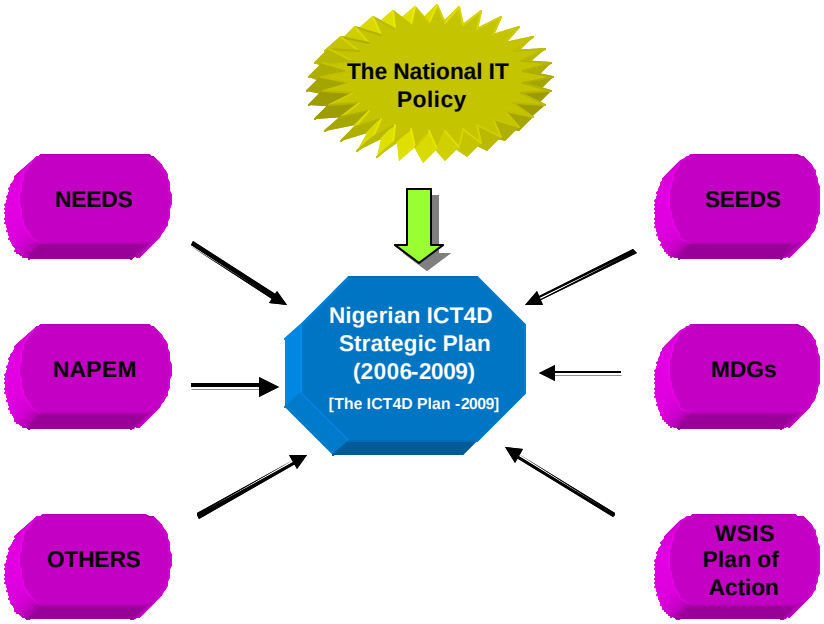
The Nigeria NICI process set the ICT4D Plans within the time frame of its National IT Policy. It was envisaged that the Policy would have a life span of 15 to 20 years, subject to its revision to take into account any changes in the nation's economic development programme priorities and the dynamic changes and advances in technology. The ICT4D Plan (the ICT4D-2009 Plan), currently at an advanced stage of development, is the first of these 4-yearly plans and the time frame set is 2006-2009.

Nigeria has made major strides in implementing ICT programmes, initiatives and projects in e-government, infrastructure development, e-education, human resource development, e-health, e-commerce, private sector development and a number of community and rural-based ICT deployment initiatives. These activities have helped to implement the provisions of the National IT Policy Document since its launch in 2000. Mainstreaming of ICT programmes and initiatives is ongoing at federal and state levels.

A key feature of the Nigerian NICI Plan is that it aims to implement not only the policy commitments and provisions of the National IT Policy Document, but is also linked (see figure 3.5) to the country's ongoing socio-economic development programmes, initiatives and priorities. These include the National Economic Empowerment Strategy (NEEDS), complementary strategies at the state (e.g. SEEDS) and local government levels, as well as the Millennium Development Goals (MDGs), and NAPEM among others. The WSIS Plan of

Action was used as a reference in identifying a number of the programmes and initiatives of the Plan. The Nigerian NICI Plan is therefore WSIS-complaint.

Figure 3.5: Policy/Plan links to development programmes



On the whole, the Nigerian NICI Plan is made up of 8pillars. Some of the pillars such as Social Sector Development and Developing Key Sectors have a target sectors. The structure of the Plan in terms of its pillars is:

- Human Resource Development;
- Electronic Government;
- ICT Infrastructure Development;
- Social Sector Development:
  - ICTs in Education;
  - ICTs in Health;
  - ICTs in Community.
- Developing Key Economic Sectors:
  - Agriculture Sector Development;
  - Service Sector Development;
  - Industrial Sector Development.
- Legal and Regulatory Framework;

- National Security and Law Enforcement; and
- R & D.

Development of both the Nigerian National IT Policy and the NICI Plan involved extensive stakeholder participation. Consultations were held nationally targeting key sectors including the public sector, private sector and civil society. The Nigerian Diaspora also played a key role in the process. The Government established a National Task Force to facilitate the Policy development process. This was a multi-sectoral Task Force with representation from all key sectors.

To support the development of the NICI Plan, the Government established the National ICT4D Strategic Plan Committee under the auspices of NITDA, with membership from all key sectors including, government, the private sector and academia. To facilitate across-the-board stakeholder participation in the plan development process, various technical sub-committees of the National ICT4D Plan Committee were established. Each technical sub-committee was tasked with developing a section of the NICI Plan.

3.2 Evolution of the Malawi NICI process

The Malawi NICI process, which also commenced after the ADF '99 meeting, is based on the ECA NICI methodology within the AISI framework. As was the case with Rwanda, the Malawi process was aimed at four key outputs, namely: the Framework, Policy, Plan and Structures. The National ICT Task Force released the Framework Document, "An Integrated Socio-Economic and ICT Policy and Plan Development Framework for Malawi", in 2000.

The Framework Document set the agenda for guiding the development of other elements of the process. The Policy Document, based on the Framework, was completed in 2003 and detailed the key policy commitments and considerations of the Government. The corresponding Action Plan currently under development will detail the programmes and initiatives for implementing the commitments as per the Policy Document. The Structures or institutional mechanisms serve as the relevant national coordinating mechanisms to support the implementation.

The Framework Document

The Integrated Socio-Economic and ICT Policy and Plan Development Framework for Malawi[22] (Framework Document) serving as a key deliverable of the of the 1st NICI Cycle of the Malawi process is aimed at guiding the development of the subsequent policy and the

[22] C.K Dzidonu, Integrated Socio-Economic and ICT Policy and Plan Development Framework for Malawi, United Nations Economic Commission for Africa, 2002.

plans and providing the analytical basis for the developing them. Specifically, the Framework, among other things:

- Reviewed and analysed the government's socio-economic development frameworks, policies, and programmes and examined the general ICT landscape and infrastructure; the degree and level of ICT deployment, utilization and development in the country with a view to defining and specifying areas worth pursuing as per the Policy Document and subsequent plans;
- Identified and crystallized the developmental challenges as well as the relevant socio-economic development vision, missions and strategies that need to be pursued to address these challenges; and
- Identified specific policy and plan development issues that were required to guide the policy development process and the subsequent plans for the deployment and use of ICTs to facilitate and accelerate Malawi's socio-economic development process within the context of the aspirations of the Vision 2020.

The specific elements of the Framework Document include:

- An analysis of the current socio-economic situation of Malawi based on key social and economic indicators;
- Identification and review of the key socio-economic developmental challenges facing Malawi;
- A review of efforts being made (past and present) to address the developmental challenges facing the country;
- A review and analysis of the Vision 2020 framework and other socio-economic development frameworks for Malawi;
- Making the case for the need to take steps to address the emerging challenges of globalization and the information age;
- An analysis of the limitations, challenges and the potentials for transforming the Malawian economy and society into an information and knowledge-based society and economy within the time-frame of the Vision 2020;
- A clear statement of the national vision for social and economic development and the corresponding strategies, measures and mechanisms for its attainment;
- Details of specific sectoral development goals that needed to be pursued to transform the Malawian economy and society as per the stated vision, mission and strategy statements;
- Details of the proposed policy development framework and the corresponding plan development framework as components of the integrated socio-economic and ICT policy and plan development framework for guiding the policy and plan development process; and
- Identification of specific institutional arrangements and structures for facilitating the policy and plan implementation process.

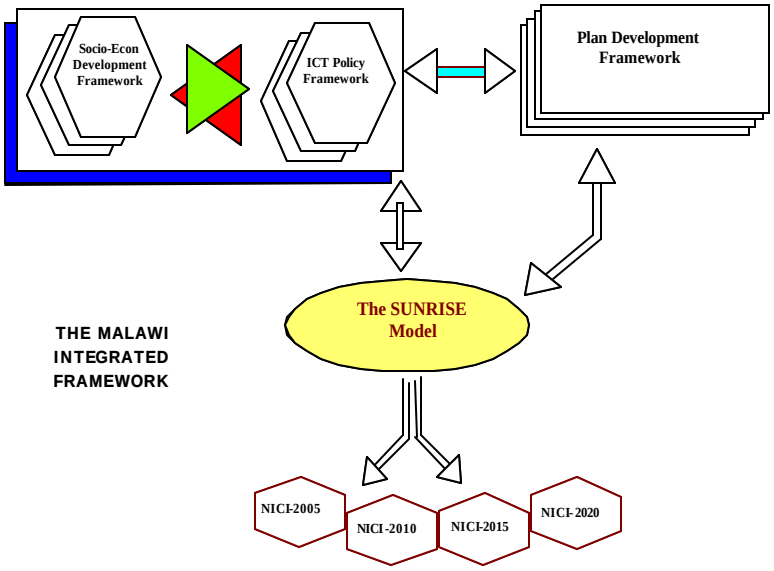
The Framework Document is divided into three parts as shown in figure 3.6.

Part I presents a review and analysis of the relevant socio-economic background information and indicators for establishing the current social and economic status of the country;

Part II presents the basis for the development of the integrated socio-economic development and ICT policy and plan framework for Malawi; and

Part III presents the proposed integrated socio-economic development and ICT policy framework for guiding the subsequent outputs of the Malawi process, including the details of the SUNRISE model, a framework for identifying suitable programmes and an initiatives for incorporation into the NICI plans.

Figure 3.6: The Framework Document



The Malawian ICT4D Policy Statement[23] is aimed at achieving a number of specific goals, the key ones being:

- To create the necessary enabling environment to facilitate the deployment and use of ICTs within the economy and society;

- To support the development of a local ICT industry to facilitate the production, manufacturing, development, delivering, and distribution of ICT products and services;

[23] Government of Malawi (2003), The Malawian Draft ICT4D Policy Statement, Government of Malawi 2003.

- To aid development of the national human resource capacity and the nation's R&D capabilities to meet the changing needs and demands of the economy;

- To facilitate the demand-driven expansion, rehabilitation and continuous modernization of the national information and communications infrastructure as dictated by advancing technology;

- To guide the development of e-government and e-governance, as well as e-commerce and business strategies and action plans;

- To facilitate the development and enforcement of the necessary legal, institutional and regulatory framework and structures required for supporting the deployment and use of ICTs; and

- To develop and promote the necessary standards, good practices and guidelines to support the deployment and use of ICTs within the society and economy;

The Policy is strategically targeted at developing an ICT sector and industry that is also a broad-based enabler of developmental goals, with emphasis on the use of ICTs to aid the development of all other sectors of the economy. The priority areas of focus for development and promotion include:

- Human Resource Development;
- ICTs in Education;
- E-Government and e-Governance;
- Private sector development;
- An export-oriented ICT industry;
- Modernization of the agriculture sector;
- A competitive value-added services sector;
- Deployment and spread of ICTs in the community;
- ICT infrastructure development;
- The legal, regulatory, and institutional framework for facilitating ICT development, deployment and use in the economy and society; and
- An ICT foreign and local direct investment drive.

The Malawi Government acknowledged that if the ICT-led socio-economic development (ICT4D) Policy was to have a desirable and substantial impact on addressing Malawi's social and economic problems and contribute to the nation's developmental process, it should be related to the wider social and economic development agenda of the country. The Government further recognized that the Policy should form an integral part of the nation's overall vision for social and economic development and also take into account the developmental challenges and performance as measured by the key social and economic indicators.

The Policy Statement is set within the wider socio-economic development objectives and aspirations of the nation and takes into consideration the provisions and the details of a number of crucial socio-economic development policy frameworks such as Vision 2020, the Malawian Poverty Reduction Strategy Paper (PRSP), the Science and Technology (S&T) Policy and other socio-economic development frameworks of Malawi. The Statement acknowledges and addresses a number of the key developmental challenges, objectives and goals of these frameworks in defining the main elements and provisions of the policy.

The ultimate goal of the Policy is to accelerate Malawi's development and transformation into a middle-income, information-rich, knowledge-based, technology- driven economy and society. It sets an ICT-led development policy and strategy within the context of achieving Vision 2020 and the Shared Vision for Malawi.

The NICI Plan

Malawi has implemented a number of catalyst and flagship projects and initiatives since the development of the ICT4D Policy in 2003. Some of these initiatives include, the Government-wide network project (GOV-Net) and other critical application systems in the area of e-government and the implementation of e-education initiatives and a number of ICT infrastructure development projects and initiatives. A number of these initiatives implement key provisions of the Policy.

The first NICI Plan, driven by a national multi-stakeholder task force is currently being developed under the following broad headings and sub-themes:

- Human capital development:
  - Education;
  - Health;
  - Accelerated Human Resource Development.
- Governance:
  - Promoting e-government and e-governance;
  - Promoting ICT security;
  - Promoting national security, law and order.
- ICT Industry:
  - Facilitating the development of the private sector;
  - Developing an export-oriented ICT industry.
- Development of ICT Infrastructure;
- Growth Sectors:
  - Modernization of the agriculture sector;
  - Promoting e-tourism;
  - Modernization of natural resources management.
- Community; and
- Legal and regulatory framework.

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This NICI Plan, the first of the four to five Plans envisaged within the time frame of the National ICT4D Policy, details the specific programmes and initiatives targeted at implementing the policy provisions and government commitments in the Policy Document. The Plan, which has an implementation time frame of four years, brings on board all ongoing national ICT programmes and initiatives of the Government and its development partners.

Stakeholder involvement in the NICI process

The national dialogue that occurred through the consultative process carried out was key to the study that preceded development of the Framework and the Policy Documents. The process brought all key stakeholders - government, private sector and civil society - on board. During development of the Framework in 2002 and on the Policy Document in 2003, a series of one-on-one meetings and consultations was held with key leaders within government, the private sector and within the civil society including academia. These meetings provided an opportunity to revisit the broad social and economic development vision for Malawi, which served as the basis for identifying the role that ICTs could play in the strategies defined for achieving that vision.

The meetings not only generated and established consensus on the socio-economic development vision for Malawi and the role for ICTs in achieving this vision but also obtained and documented the views of the national leaders and other stakeholders on the subject of the national socio-economic development strategy and the extent to which the deployment and use of ICTs was a key component of this strategy.

On the policy consultative process, a number of high-powered review meetings were convened before submission of the national ICT4D Policy to the Cabinet for approval. The Parliament is also scheduled to consider and debate the provisions of the Policy.

It is envisaged that the development of the NICI Plan, the first of the four, will also be through a consultative process. The multi-stakeholder National Task Force set up to coordinate development of the Plan has been organizing a series of stakeholder meetings to facilitate across-the-board multi-stakeholder participation in the plan development process.

Chapter 4

The Regional Dimension

4.0 Regional Strategies for Regional Integration

Regional integration is necessary to overcome the limitations inherent in Africa's small and fragmented economies and to afford the continent a greater voice in the management of international economic processes. Increased regional integration and economic cooperation is important for ensuring sustainable development in Africa and assuring a greater share in the global economy. Mechanisms for integration, such as establishing vertical and horizontal economic links, are desirable for facilitating larger free trade zones and joint development projects. In view of inherent multiplier effects, ICTs play an important catalytic role in the development of all the other sectors and regional integration as a whole. The role of ICTs in speeding and expanding regional cooperation and integration has increasingly gained considerable attention. A regional approach to ICT development and building of the Information Society can allow for greater harmonization of national efforts in strategy and policy formulation and implementation. ICTs will have a substantial impact on regional cooperation and integration, provided suitable policies, programmes and mechanisms are established.

It is important therefore that regional cooperation and integration efforts mainstream Information Society issues into their programmes from the on set. ICTs are the foundation to improved intra and inter-institutional communication among regional cooperation institutions, thereby promoting trade, financial cooperation and efficiency in key sectors such as agriculture, health and education.

Regional organizations should therefore facilitate the integration of African countries and develop programmes and strategies to further consolidate regional cohesion. RECs should assume a leading role in regional consultations and in the development of regional e-strategies that are not only linked to national e-strategies, but address regional communications policy, financing and regulatory issues in a way that promotes harmonization.

Regional coordination will enable the continent to overcome limited market size, reach critical mass and ensure economies of scale. The need to attract huge investment in developing the Information Society will be mitigated by regional coordination in resource mobilization. In addition, developing a common approach can improve prospects for mainstreaming developed applications (e-commerce, e-government, ehealth, e-education) into other regional initiatives and strategies. This lays the required foundation for promoting greater economic integration through increased intraregional trade and economic cooperation among countries and accelerated integration of countries into the global economy.

4.1 Regional policies and plans

The Regional Information and Communication Infrastructure (RICI) is ECA's response for harmonizing national strategies at the subregional levels by Regional Economic Communities. The RICI addresses regional communications policy, financing, partnerships and regulatory issues and provides a framework for the development of information and communication infrastructure whilst strengthening capacity and also building a critical mass to facilitate regional economic integration through ICTs. This framework also provides an impetus for strengthening capacity at the subregional level in ICT4D, whilst also building a critical mass to facilitate regional economic integration through ICTs.

Regulatory integration at the regional level would create and strengthen the associations of regulators to facilitate cross-border interaction and market enlargement. A key component of the harmonization process at subregional level would entail policies establishing common tariffs for ICT products and services across borders. This would also offer potential for cost sharing in executing joint projects at subregional and regional levels, particularly the financing and strengthening of connectivity in the region.

4.2 The ECA response to regional initiatives

In response to the strategic refocusing of ECA programme priorities towards trans-boundary initiatives and activities in sectors vital to the regional integration agenda, ECA has been supporting several REC's including the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of West African States (ECOWAS), the Southern African Development Community (SADC), the West African Economic and Monetary Union (UEMOA), and the Arab Maghreb Union (AMU) in the development of RICI Initiatives.

The following activities were undertaken by ECA:

Common Market for Eastern and Southern Africa (COMESA)

The formulation of the COMESA ICT strategy emerged through a broad participatory process. The strategy identified relevant application of ICT in sectors where this could produce multiplier effects for development in the whole subregion. The draft ICT strategy for COMESA was presented and discussed at an experts' group meeting in February 2006. Inputs from the meeting were reviewed and submitted for adoption during the COMESA Council of Ministers meeting in 2007.

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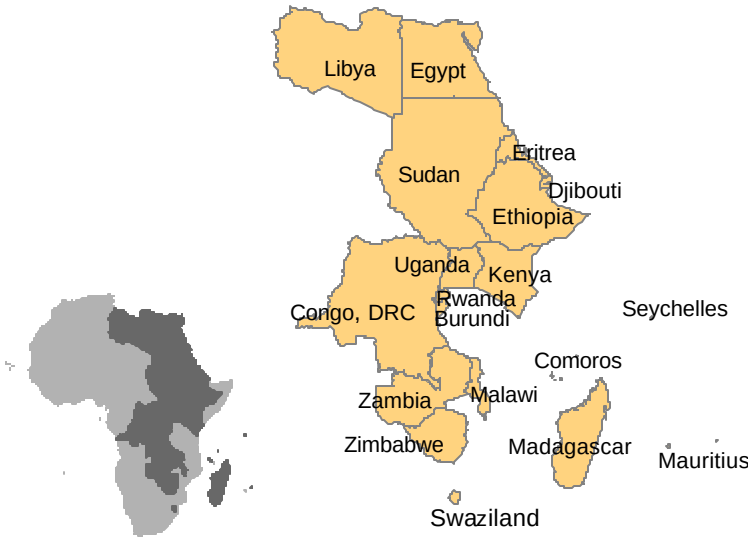
Figure 4.1 Common Market for Eastern and Southern Africa (COMESA)



COMESA member States are Angola, Burundi, the Comoros, Democratic Republic of Congo (DRC), Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, the Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

East African Community (EAC)

In the framework of ePol-Net, ECA assisted the EAC (figure 4.2) in developing an e-Government Strategy for the subregion. The EAC Regional e-Government Framework considered an action roadmap in strategic areas supported by enabling legal environment, secure information infrastructure and adequate human resources. On the policy front, the strategy outlined the agreements and protocols that should be in place to sustain e-government services, applications and content in a harmonized manner across the region.

The policy statements also proposed a review and adaptation of legislation at national and EAC level to ensure interoperability, competitiveness and reducing legal obstacles relating to online services. The framework also included the following strategic areas: Customs and Immigration Control, e-Parliament, e-Health, e-Banking & e-Procurement, e-Commerce and e-Tourism, Meteorological and Tidal Information**.** The Regional e-Government Framework for EAC was adopted and approved by the 13th meeting of the Council of Ministers and endorsed by the 6th EAC Summit held in November 2006.

Figure 4.2: East Africa Community (EAC)

Member States of the East African Community are Kenya, Tanzania and Uganda.

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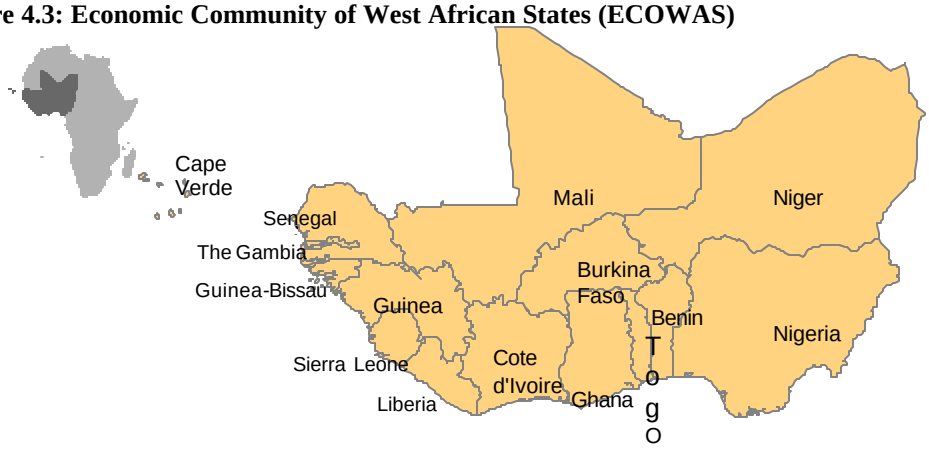
Economic Community of West African States (ECOWAS)

Despite efforts geared towards trade liberalization in the framework of both ECOWAS (figure 4.3) and UEMOA, intra-west-African trade remains insignificant, due partly to lack of market information, poor communication facilities and cumbersome trading processes and procedures. One of the objectives of regional integration in West Africa is to dismantle the tariff and non-tariff barriers with a view to boosting intra-regional trade. This can be achieved through the deployment and use of ICTs in general, and use of electronic commerce in particular, to promote intra West African Trade and attract foreign direct investment (FDI).

Figure 4.3: Economic Community of West African States (ECOWAS)



The 15 member States of ECOWAS are Benin, Burkina Faso, the Gambia, Ghana, Guinea, Guinea Bissau, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.
The activities in ECOWAS are therefore geared towards the promotion of regional integration through e-commerce. To this end, two studies on a harmonized legal framework for e-commerce and a harmonized legal framework for ICT were conducted. The outcomes of the studies discussed at a workshop organized by ECA, ECOWAS and UEMOA on the 19 – 20 December 2006 in Ouagadougou, Burkina Faso were:

- Review of the ICT regulation status with respect to e-commerce in ECOWAS member states and an analysis of existing legislation;
- Proposal for a legal framework for e-commerce and related activities providing possible options towards the development of harmonized guidelines on various legislative priorities for the successful development of e-commerce in ECOWAS; and
- Development of draft guidelines currently being circulated to ECOWAS member States for discussion before adoption by the ECOWAS Commission and individual countries.

The draft guidelines are as follows:

Harmonized ICT framework for West Africa

The draft guidelines take into account the commitments of West African countries in global, regional and subregional forums and propose a basis for effective participation of the subregion in the information economy through the following four priority objectives:

- Participation of all stakeholders in information and knowledge resource creation;
- Promotion of a universal access system to ICTs, knowledge resources and partnerships;
- Security of information resources and individuals; and
- Promotion of ECOWAS and UEMOA of the principles enacted in AISI and the African Regional Action Plan on the Knowledge Economy (ARAPKE).

The guidelines also identify the rights, roles and responsibilities of the various stakeholders (government, civil society, private sector and individuals) and the partnerships to be established at local, national and international levels as well as incentives for various sectors and applications. It is envisaged that a watchdog mechanism responsible for the monitoring and evaluation of ICT harmonization standards to ensure continuous improvement and adherence will be established through the West African Strategic Council on ICT (WASTIC).

Personal data protection in West Africa

Guaranteeing personal data and freedom and at the same time promoting the development of ICTs can only be achieved through a mechanism that combats threats and risks inherent to ICT diffusion and development. This is particularly important in the West African subregion where there is a juridical vacuum on personal data protection. The draft guidelines are based

on best practices, including those enacted by the UN General Assembly in 1990 taking into account the specificities of the subregion.

For overseeing personal data protection at national level, the establishment of a Data Protection Authority comprising of lawyers, ICT experts, parliamentarians and civil society groups is proposed along the lines of models used in Canada and France.

E-commerce in West Africa

Although e-transactions are still few and far between in the West African sub region, the growth potential is high despite several obstacles related to e-commerce regulatory texts. There is therefore a need to develop a regulatory framework which suits the legal, cultural, economic and social environment of West Africa. The draft guidelines are geared towards ensuring security and a legal framework for the development of reliable and effective e-commerce in the sub region.

Response to cyber crime in West Africa

The rapid development of ICTs has created a cyber crime phenomenon for which national laws are inadequate as they were established for specific countries and did not cater for some of the activities intrinsic to the digital era. Accordingly, there is need for relevant laws against cyber crime in general and money laundering in particular for the West African subregion. The existing regulations on money laundering are related to the electronic payment system in UEMOA and physical exchange means in ECOWAS. Harmonized legislation is therefore required to take into consideration both the ECOWAS and UEMOA regulations.

The draft guidelines on cyber crime are geared towards the modernization of instruments for fighting cyber crime through elaboration of relevant new ICT texts and adaptation of some of the existing national laws to suit technological developments.

Implementing the four guidelines require that the West African member States adopt and translate the guidelines into laws. There will be need for continuous dialogue and interaction among countries and the ECOWAS Commission. There will also be need for capacity-building and awareness raising programmes to train the various stakeholders such as lawyers, ICT professionals, parliamentarians, policy makers, business community, etc in the knowledge economy. If successfully implemented, the guidelines could be replicated in other subregions and the continent at large.

Central African sub region

ECA, through its two Subregional Offices (SROs) in Kigali and Yaounde, is supporting the activities aimed at the development of a regional strategy on the information and knowledge society for the two RECs, Central African Monetary and Economic Community (figure 4.4) and the Communauté Economique des Etats d'Afrique Centrale (figure 4.5). The scope of the

programme extends the eCEMAC 2010 to all CEEAC countries as a framework for the implementation of the Information Society in the subregion.

Figure 4.4: Central African Economic and Monetary Community (CEMAC)

Seven member States

• *Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon, Sao Tome and Principe*

Figure 4.5: Economic Community of Central African States (CEEAC)

The 14 member States of the Economic Community of Central African States (ECCAS – CEEAC) are: Angola, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo (DRC), Republic of Congo, Equatorial Guinea, Gabon, Rwanda and Sao Tome and Principe.

Strategic objectives

The subregion is encouraged to use ICT's to enhance regional integration, socio-economic development and poverty reduction. It proposes new concrete initiatives in terms of actions and subregional projects that promote connectivity and active participation in the knowledge economy.

The strategy is centred on the following pillars:

- Development and implementation of an action plan on the revision of the regulatory and legal framework to facilitate convergence between existing networks and new technologies;
- Infrastructure development and network interconnection;
- Development of sectoral strategies (e-government, e-commerce, e-health, e-education etc);
- Establishment of model incubators for SMEs and capacity-building on e-trade and e-business;
- Strengthening of the capacities of the private sector;
- Establishment of a R and D strategy;
- Strengthening the secretariat capacity of CEEAC and CEMAC and the relevant national institutions;
- Evaluation of the usage of the Automated System for Customs Data (ASYCUDA) by the various customs administrations; and
- Evaluation of the current tracking tools of the wood industry, creation of a portal for information exchange and creation of an electronic system for the sustainable management of forests.

The main objective of the five-year strategy is the "improvement of the enabling environment and infrastructure for healthy competition which would promote innovation and attract investment". It sets up clear objectives, defines an institutional and implementation framework and indicates responsibilities for implementation at both national and subregional levels.

A series of draft directives have been prepared to harmonize the regulatory environment of the subregion. This harmonization is expected to:

- Create and promote a Central African subregional market by facilitating intraregional traffic;
- Protect user interests and attract private investors;
- Protect the security of individuals and promote Internet-secure transactions; and
- Take into account the need for convergence of technologies.

Draft guidelines on establishment of a Committee of Regulators

In order to promote cooperation between national regulatory authorities and ensure strict adherence to subregional guidelines on electronic communications, it was necessary to establish the Committee of Regulators. The guidelines define the scope and activities of the Committee.

Draft guidelines on a harmonized ICT framework for CEMAC

The draft guidelines lay the foundation for effective participation of the subregion in the information economy. The guidelines define a harmonized ICT framework on electronic communications within CEMAC member States, taking into account the commitments of Central African countries in global, regional and subregional forums.

Draft guidelines on harmonized interconnection costs

The draft guidelines define the scope for harmonizing regulations governing interconnection among member States. The guidelines deal with interconnection between electronic communication networks and service providers, sharing of infrastructure and access to the local loop to promote competition, interoperability and diversification of services at affordable cost to the user.

Draft guidelines on Universal Service

The draft guidelines define a harmonized framework on national Universal Access policies in CEMAC countries, whilst also providing the scope of services that qualify for the Universal Access principle and conditions for implementation and financing.

Draft guidelines on harmonized electronic communications tariffs for Central Africa

The objective of the draft guidelines is to harmonize rules on electronic communications tariffs for the benefit of the user. The guidelines define the scope for setting up and controlling harmonized tariffs applicable to some electronic communications as the basis for national regulations.

Project status and challenges

The implementation of the strategy at both national and subregional levels will be a major challenge necessitating close collaboration between CEEAC and CEMAC to ensure that ICT's become as a cross-cutting priority to be mainstreamed in the various PRSPs of member countries. This will enable the subregion to benefit from the funding earmarked for various programmes. The strategy should be incorporated into the Medium- and Long-Term Framework (MLTF) for the development of infrastructure in Central Africa.

The lead role of the two RECs would also be to facilitate ICT mainstreaming in the regional integration programme for attainment of the MDGs. This would require the establishment of

an enabling environment, development of a legal and regulatory framework, infrastructure deployment, creation of subregional ICT industries, development of local content and capacity-building. The strategy is awaiting adoption by Heads of State.

Arab Maghreb Union (AMU)

In North Africa, a study is currently underway in collaboration with AMU on the status of e-commerce development in the subregion and this would culminate in the development of an on-line platform for e-commerce.

Figure 4.6: Arab Maghreb Union (AMU)

The AMU member States are Libya, Morocco and Tunisia.

Project objectives

The objective of the platform will be to facilitate and promote trade and partnerships among North Africa countries by using ICT's as an enabler and facilitator for ease of access to information and knowledge. Trade among North African countries is now less than 6 per cent of the total trade and is one of the lowest regional rates in Africa and the rest of the world.

This low rate is partially attributed to:

- The trade vision of the countries within the region directed more towards the North, in particular Europe, than towards the subregion;
- Lack of knowledge of the trade practices in force in the different countries of the region in terms of customs procedures, tariffs etc; and
- Inadequate knowledge of markets (products, product quality and services offered) in countries within the region.

The proposed regional electronic trade platform seeks to address this as it will be for both Business-to-Business (B2B) and Business to Government (B2G) transactions and will over time, evolve through three stages, informational, interactive and transactional. This will

encompass all enterprises and their products as well as external trade formalities and procedures.

The platform identifies the following three ways to attain this objective:

- Identification of products to be traded and promotion of on-line business opportunities;
- Facilitation of the business formalities and shortening of the trading time through better knowledge of external trade legislation and procedures; and
- Conducting on-line trade for exports from the country of origin and import to the country of destination via interconnection of the existing external trade customs systems.

This platform will also be used as an e-procurement platform for member States and when fully operational, the e-commerce platform is expected to deliver the following:

- Regional trade development and new export markets (North Africa and other regions of the world);
- Effective on-line presence of the North African exporters and their respective products;
- A single regional e-commerce platform including product specifications;
- Easy access to regional economic information and exchange regulations; and
- Promotion of AMU and North African domestic products.

The platform will also incorporate multicultural, multilingual user and administration interfaces and some of the functions will include:

- General information on the region and countries, companies, and products;
- Regulatory aspects and regulating and support bodies;
- A multi-criterion research engine by company, product, sector and geographic location;
- A dynamic module to company access;
- Tender bids and business opportunities; and
- Newsletters.

Project status and challenges

Project specifications were developed, presented and adopted at a regional stakeholder workshop: "North Africa Development Forum" held in Morocco in February 2007.

Securing the political will of member States and resource mobilization have posed as major challenges in the development of the platform.

Information/data collection in relation to legislation, custom regulations, trade/tariffs, standardization and company registration has also been a challenge for this project. In order to facilitate information collection and company registration, the proposed platform will have a dedicated web interface to be used by several partners e.g. chambers of commerce, professional organizations, etc.

Chapter 5

SCAN ICT: Indicators and NICIs

5.0 Measuring ICT4D: The Scan-ICT Initiative

What is SCAN ICT?

Background

At the adoption of the African Information Society Initiative (AISI) in 1996, it was recognized that efforts being undertaken in the continent to harness ICT for development could only bear fruit if supported by sustained efforts to design and implement effective and appropriate tools to measure the impact of ICTs in various sectors of the economy and in the society at large. In most African countries, there is a lack of basic information on key ICT and related economic and social indicators, as well as on ICT-related activities.

Recognizing the crucial role that ICTs can play in facilitating socio-economic development, a number of countries have formulated or are in the process of developing ICT for development (ICT4D) policies and strategic action plans to facilitate the process of transforming economies and societies. To support these efforts, attention is increasingly being directed to the development of suitable Information Society assessment and measurement indicators. This is in response to the World Summit for the Information Society (WSIS) Plan of Action on the development of suitable indicators to monitor and measure the development of the Information Society.

The development of these indicators is essential to support and facilitate key aspects of the ICT4D process as part of efforts targeted at addressing the developmental implications of the digital divide. Appropriate indicators would also elucidate the magnitude of the digital divide in both its domestic and international dimensions and provide a baseline for regular assessment, whilst also tracking global progress in the use of ICTs to achieve internationally agreed development goals, including those of the Millennium Declaration.

To respond to the challenge of monitoring the progress in the implementation of national e-strategies, the Scan-ICT programme[24] was launched in November 2000 as a collaborative project between the Acacia programme of the International Development Research Centre (IDRC) and the United Nations Economic Commission for Africa (ECA), with financial support from the European Union (EU) and the Norwegian Agency for Development Co-operation (NORAD). The objective of this initiative was to build the capacity of national statistical offices and research institutions in monitoring, analysing and evaluating progress

[24] http://www.uneca.org/aisi/scanict.htm

achieved at the national level and subsequently attracting investment to the ICT sector. This multi-partnership initiative monitors the penetration, impact and effectiveness of ICT applications in pilot countries across Africa whilst also providing value to the AISI implementation at the national, regional and global levels. Furthermore, the programme aims at assisting member States in their efforts to develop the Information Society and economy through the compilation of suitable Information Society/ICT4D indicators that would guide ICT policy, plan and implementation processes.

5.1 Scan-ICT Phase I

The first phase of the programme, which comprised six countries, namely, Ethiopia, Ghana, Mozambique, Morocco, Senegal and Uganda, was completed in 2004. The minimum and common themes identified for data collection were based on indicators developed in AISI focus areas such as infrastructure, sectoral applications (education, health, public sector, and private sector) and the information economy.

The main recommendations of the first phase of the Scan-ICT project were in three categories, namely, policy issues, human resources development and infrastructure. Specific recommendations included:

- The creation of an enabling policy environment for ICT4D by strengthening regulatory frameworks:
    - Instituting policy reforms in the telecommunications sector;
    - Adopting measures to reduce tax and duty levied on computers and accessories;
    - Reduction in ICT access charges.
- Encouraging enterprise development and private investment by increasing the availability of credit facilities and creating venture capital;
- Increasing access by empowering citizens economically through the implementation of innovative poverty reduction programmes;
- Designing and implementing comprehensive ICT4D master plans for addressing current and future ICT needs at all levels;
- According priority to small ICT projects with immediate and discernable development impact, e.g. telecentres, instead of mega-projects requiring huge investments;
- Designing and launching ICT training programmes including an ICT awareness-creation campaign;
- Encouraging and supporting private sector involvement in R&D, software development; subcontracting with client firms, entry into joint research ventures with foreign companies and taking advantages of low labour costs; and
- Infrastructure deployment and expansion to enable inclusive access to basic telecommunications services thereby bridging the urban-rural ICT infrastructure gap.

The main findings at the country level for sectoral applications (education, health, public sector and private sector) were:

- ICT penetration was generally higher among educational institutions and public administration facilities in most of the six pilot countries than among health institutions;
- Shortage of qualified staff was a critical issue for all sectors. The proportion of ICT experts was very low as few schools and universities had fully incorporated ICT into their curricula;
- Computers were widely used only as traditional office tools; and
- Although home pages and elaborate sites on the World Wide Web were popular throughout the world, the percentage of institutions with websites was low. Site content was frequently limited to information of a very generic nature. Internet resources as a tool for business and commerce had not made a substantive impact in the Scan-ICT sectors and industries.

5.2 Scan-ICT Phase II

Evaluation of the first phase led to the decision to empower National Statistic Offices (NSO's) to develop ICT indicators for the continent. This was in line with decisions of the first phase of the WSIS, which urged countries to take stock of activities related to ICT deployment, development and usage. As a result, NSOs, national observatories for ICTs and ICT Ministries were identified as implementing partners to undertake the Scan-ICT II country studies.

The Scan-ICT Phase II is currently being implemented in Cameroon, the Gambia, Ghana, Mauritius and Rwanda with financial support from the Government of Finland. The main objective of the second phase is to ensure the sustainability of the Scan-ICT process and to integrate it as an essential part of the NICI policy. NSO's or respective Government agencies need to be closely involved in the process so as to realize the goal of creating a pan-African ICT network that would collect, analyse and disseminate ICT4D indicators.

The Scan-ICT Phase II process commenced with consultative workshops leading to development of a document detailing the priority theme areas, selected core ICT4D indicators, data collection and analysis, survey instruments and geographical coverage. The outcomes will be published on a national Scan-ICT website and database.

Project status

Cameroon completed the project and submitted the final report and a corresponding website on the findings. Gambia, Ghana, Mauritius and Rwanda were undertaking data analysis and database/website development and the process was scheduled for completion in mid-2007.

The Cameroon Scan-ICT project made key recommendations and proposed measures to facilitate access to ICT and to enhance training in the use of ICTs. These were:

- Training of personnel in the use of ICTs, training of trainers and introducing ICTs in the school curriculum;
- Reducing the costs of communication and equipment by reducing taxes on the goods and services of this sector; and
- Awareness raising on the use of ICTs.

ECA and its partners organized a regional workshop in March 2007 in Addis Ababa, Ethiopia to review progress with implementation of Scan-ICT Phase II. The event served as a platform for NSO's, Ministry and regulatory agency representatives (i.e. the producers and/or users of ICT statistics) to share best practices in ICT measurement at the regional level, cognizant of the need for comparable data on Information Society developments. The workshop also examined and reviewed the results achieved and challenges encountered in implementing the Scan-ICT Phase II project.

5.3 Linkages between Scan-ICT and the NICI process

ICT indicators were a vital cog in the wheel of the development of NICI policies and plans. In most cases, the NICI process commenced with a baseline study which established benchmarks so that subsequent monitoring and evaluation could assess the effects of identified activities for a target population and provide relevant information for formulation of short, intermediate and long-term specific objectives. The Scan-ICT process produced the essential information to direct the policy pronouncements to areas of need and evaluate the NICI policy impact. The Scan-ICT process required evaluation of long-term development effects and establishment of permanent frameworks and processes such as NICI, backed by institutional arrangements, possibly through NSO's, to sustain the process.

In Ghana, the data collected during the first phase of Scan-ICT project served as baseline data for the development and formulation of the Ghana ICT4D Plan. The ICT indicators used for collecting data through the Scan-ICT project were based on the NICI pillars identified in the Framework Document of the Ghana NICI. The spin-off from the Ghana Scan-ICT project resulted in the same methodology being adopted in the Nigerian and Ethiopian development processes.

In Uganda, the development of the national ICT policy benefited significantly from the study and results of the first phase of the Scan-ICT initiative. The single source of information and data used in the development of strategies for implementation of ICT policy and action plans was the Scan-ICT study. The study provided a comprehensive national ICT profile that included microeconomic and national ICT infrastructure indicators, segregated secondary information and data on ICT status in the upcountry districts outside the capital, Kampala, and the commercial municipality of Jinja. The nature and scope of ICT sector intervention and levels of investment in the ICT sub-sector were also identified. This information was key to development of the draft national ICT policy.

Information from the Scan-ICT study was also useful in formulating the implementation strategy for the Rural Communication Fund, to set up rural networks. In addition, Scan-ICT

information and data played a significant role in providing readily available information on the status of ICT to investors and to the Uganda Investment Authority, to facilitate investment decisions. The Scan-ICT report was regarded as a one-stop shop for national ICT data and information.

Lessons learnt in this area have so far indicated that the national Scan-ICT process should be a part of the NICI process under the leadership and ownership of the NSOs. This would support continuous evaluation of ICT developments and their related impact on socio-economic development. Continuous status monitoring, assessment and measurement would provide information for decision makers and for benchmarking at regional and global levels.

5.4 Scan-ICT case studies

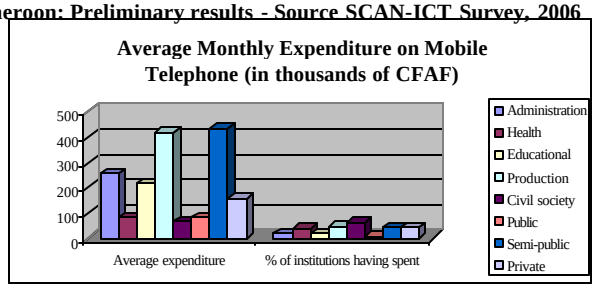
Cameroon

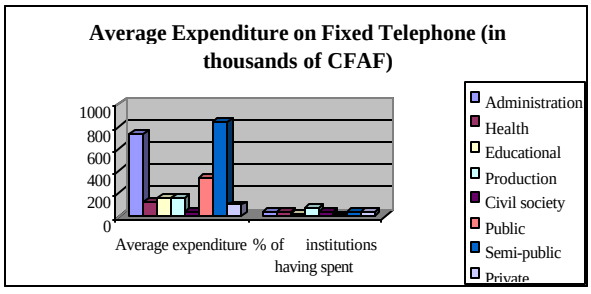
The Scan-ICT survey in Cameroon assessed expenditures on consumption of ICT services. The average expenditure on telephone consumption was calculated on a monthly basis. The telephone facility included both fixed telephony and mobile telephony. The results of the survey indicated that of the 812 sampled institutions, 29 per cent registered a monthly expenditure on mobile telephone communication and 30 per cent for fixed telephone communication. Furthermore, the results revealed that of all the institutions, civil society and the production sector utilized relatively higher revenues on telephone bills as compared to the education and heath sectors.

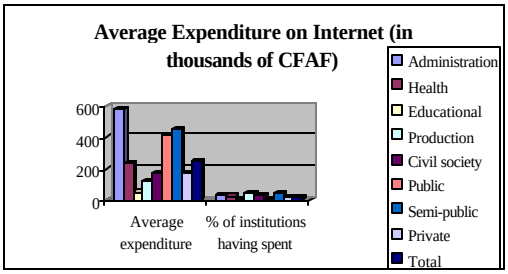
On mobile telephony development, the survey results indicated that this development was at a personal level and very few enterprises included mobile telephony in their holistic communication plans. A significant number of institutions used personal employee mobile phones for official use.

Expenditure on Internet services was still relatively low with only about 20 per cent of the institutions surveyed registering monthly expenditures for this facility. The low level of Internet penetration in the country accounted for the low expenditure.

Figure 5.1: Cameroon: Preliminary results - Source SCAN-ICT Survey, 2006







To address the constraints/obstacles related to ICT access and training in the use of ICT, the following recommendations were proposed:

- Training of personnel in the use of ICT. The government should not only support training of trainers, but also include ICT in the school curriculum;
- Reducing the costs of communication and equipment by reduction of taxes on ICT goods and services;
- Sensitizing and popularizing ICT - awareness raising on the use of ICTs; and
- Provision of State subsidies since 20.5 per cent of institutions recommended that the State should provide subsidies for this sector to enhance the ICT4D role.

Finally, issues ranging from reduction in costs, awareness raising, sensitization and training of the population were major factors linked to ICT development in Cameroon.

The Gambia

In the Gambia, the Scan-ICT project analysed the status of ICT in business:

- Computer access/usage

Of the businesses which responded, about 85 per cent acknowledged computer usage of which, 81 per cent had Internet access. More than 97 per cent of the businesses reported that they regularly used the Internet services/facilities (table 5.1).

Table 5.1: Percentage distribution of businesses by uses of computers, access to and use of Internet facilities

Questions	Responses		
	Yes	No	Total
Business Uses Computers	85.10	14.90	100.00
Business have Access to Internet	80.90	19.10	100.00
Business Used Internet Regularly	97.30	2.70	100.00

Source: 2006 Scan-ICT Baseline Sector Surveys.

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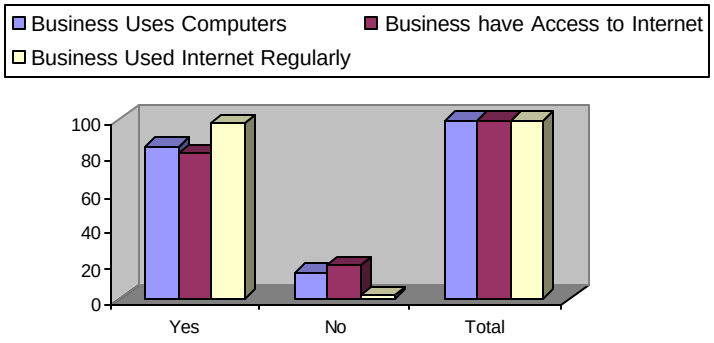
Figure 5.2: Computer usage in business



With regard to the purpose of Internet usage, all businesses surveyed reported that use of the Internet was for information browsing, whilst 97.30 per cent used the Internet for communication purposes. Only a few businesses, 17.10 per cent, used the Internet for conducting business with government offices and institutions (table 5.2).

Table 5.2: Percentage distribution of businesses by purpose of Internet use

Purpose of Internet Use by Businesses	% of Business
Accessing information	100.00
Communication	97.30
Purchasing/Ordering goods/services	48.60
Internet banking/other financial services	45.70
Searching or research	69.40
Education and learning	45.70
Conducting business with government	17.10
Leisure activities	34.30

Source: 2006 Scan-ICT Baseline Sector Surveys.

In terms of receiving and placing online orders, about 23 per cent of businesses acknowledged receiving online orders, whilst about 30 per cent placed online orders.

Table 5.3 Businesses that place and receive online orders via Internet

Questions	Responses		
	Yes	No	Total
Business received online orders via internet	23.10	76.90	100.00
Businesses placed online orders via internet	29.70	70.30	100.00

Source: 2006 Scan-ICT Baseline Sector Surveys.

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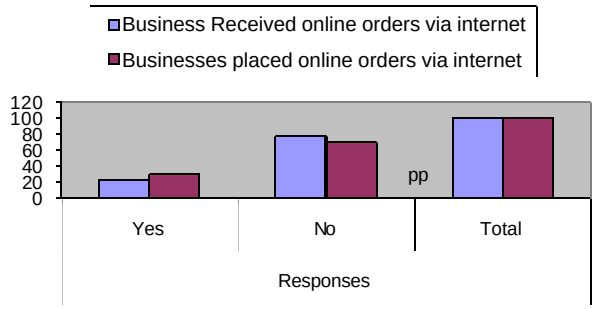
Figure 5.3: Business online orders



The value of orders received over the Internet as a percentage of total value of orders was estimated at about 3.7 per cent. This figure was an estimate as there was no additional information to verify authenticity or allow for computation of this estimate.

Types of Internet connection/networking

About 4 out of every 10 businesses surveyed used the analogue/modem type Internet connection. Wireless Internet connections were however on the increase.

Table 5.4: Percentage distribution of businesses by type of Internet connection (% of businesses using feature)

Type of Internet Connection

Analogue Modem	ISDN	Wireless	Others	Total
39.50	15.80	36.80	7.90	100.00

Source: 2006 Scan-ICT Baseline Sector Surveys.

About 54 per cent of businesses acknowledged the use of Intranet type networked computers within their premises. Only about 5 per cent reported the use of extranet networking systems.

Table 5.5: Percentage distribution of type of network in business (% of businesses)

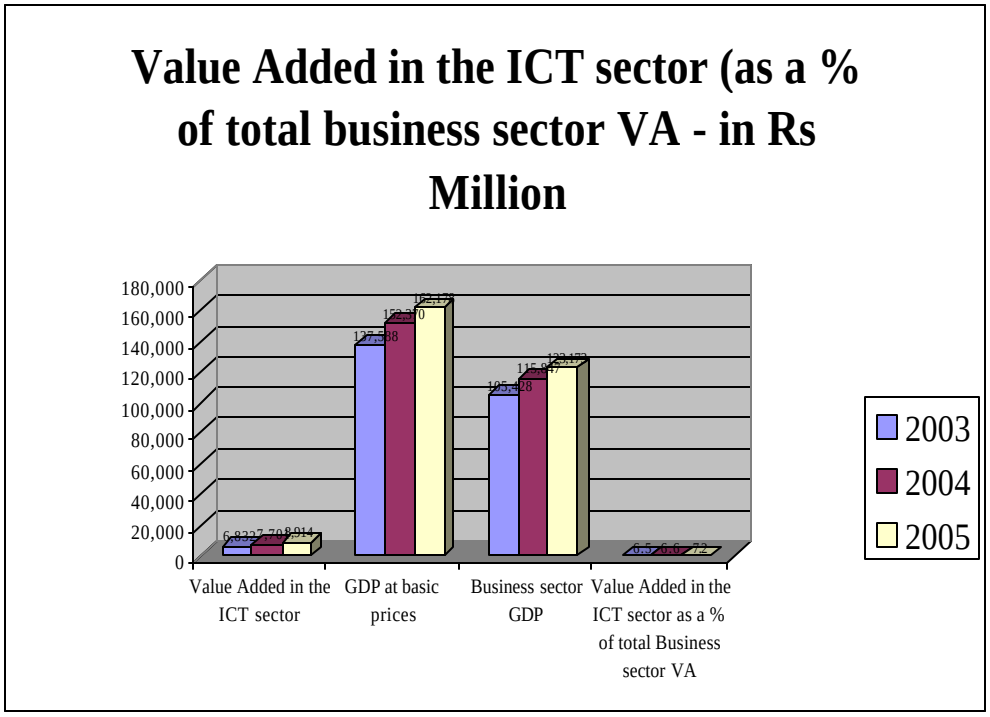
Type of Network		
Intranet	**Extranet**	**None**
53.50	4.70	41.80

Source: 2006 Scan-ICT Baseline Sector Surveys.

Mauritius

The Scan-ICT project in Mauritius focused on assessing ICT trade, based on indicators such as value added in the ICT sector as a percentage of total business sector value added. Value added in the ICT sector is the sum of value added of all establishments falling within the sector.

Figure 5.4: Value Added in the ICT sector ($1 = 31.5 Rupees)



An analysis was also conducted on ICT goods imports as a percentage of total imports, and ICT goods exports as a percentage of total exports. ICT goods imports were compiled from total imports of goods from customs data based on the list of ICT goods provided by OECD (the sum of imports of all ICT goods as per OECD list of ICT goods). Similarly, ICT exports were compiled from total exports of goods based on the list of ICT goods provided by OECD (the sum of exports of all ICT goods as per OECD list of ICT goods). Imports were valued at a cost, insurance and freight (CIF) basis, whereas exports were valued at the free on board (FOB) basis. See table 5.6.

Table 5.6: ICT goods imports as a percentage of total imports and ICT goods exports as a percentage of total exports (in million Rupees)

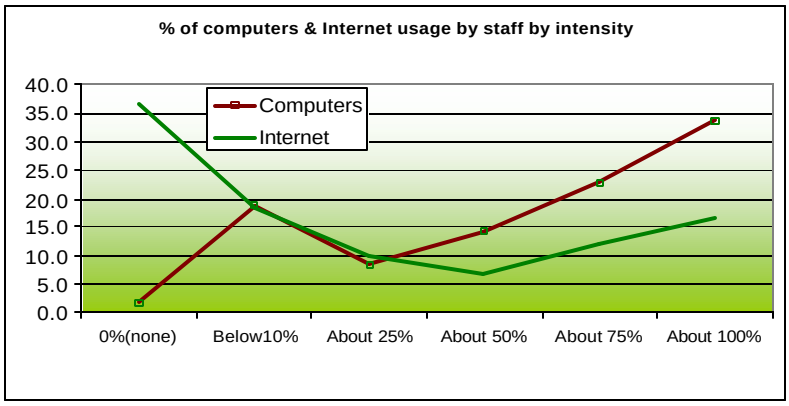
ICT Goods	2003	2004	2005
ICT goods Imports (CIF)	3,627	4,811	12,277
Total Imports of goods (CIF)	65,942	76,387	93,282
ICT goods Imports as a % of total Imports of goods	5.5	6.3	13.2
ICT goods exports (fob)	850	1,549	8,484
Total exports of goods (fob)	50,978	52,704	59,095
ICT goods exports as a percentage of total exports of goods (%)	1.7	2.9	14.3

Rwanda

The Rwanda 2nd NICI- Plan was approved by the Cabinet in July 2006 to support the strengthening of the economic base so as to accelerate development and growth towards achieving an information-rich, knowledge-based society and economy. The National Institute of Statistics (NIS) of Rwanda supported this process through the provision of the required ICT data and information collected through a number of surveys and studies. In addition, the proposed e-Rwanda project was intended to fast-track activities identified by the plan. Sixty-four activities were selected for analysis and consideration from the 87 identified by the 1st NICI Cycle plan. The Scan-ICT Phase II in Rwanda is serving as the main mechanism for conducting this analysis.

The following charts were the preliminary results of the Rwandan Scan-ICT project.

Figure 5.5: Percentage of computers & Internet usage by staff intensity



Education Sector – Summary of Results

Figure 5.6: PC availability and usage in the education sector

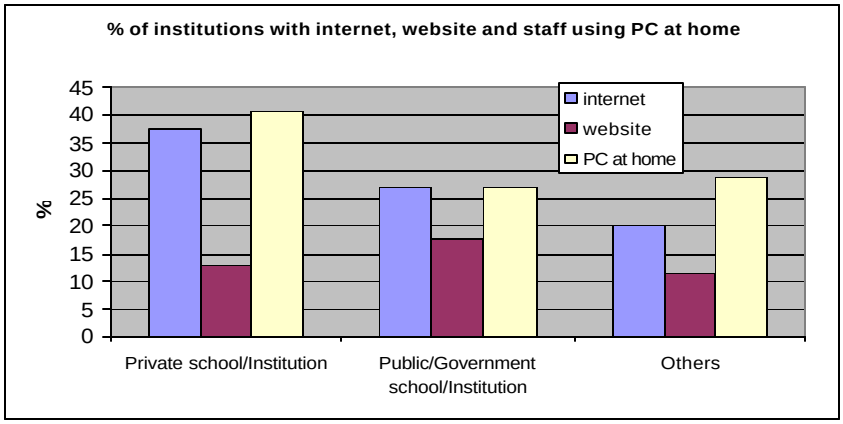
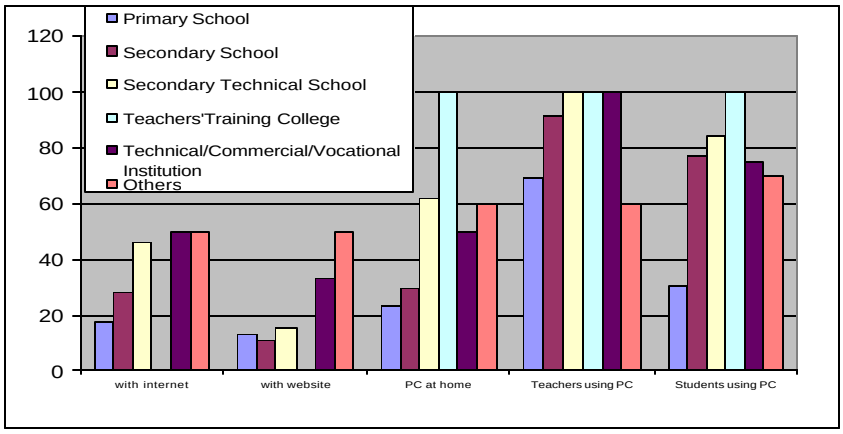
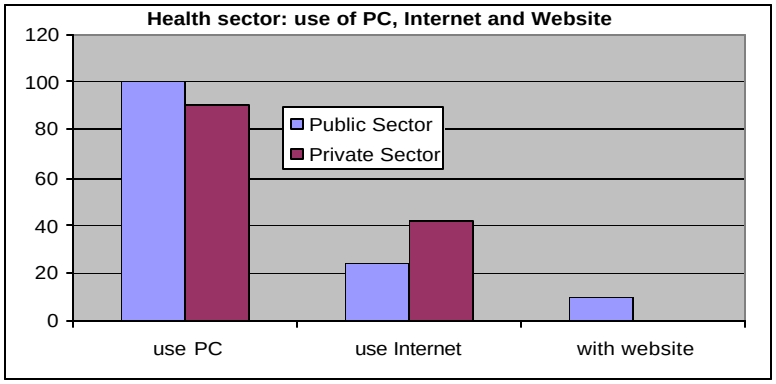


Figure 5.7: PC availability and usage in the education sector



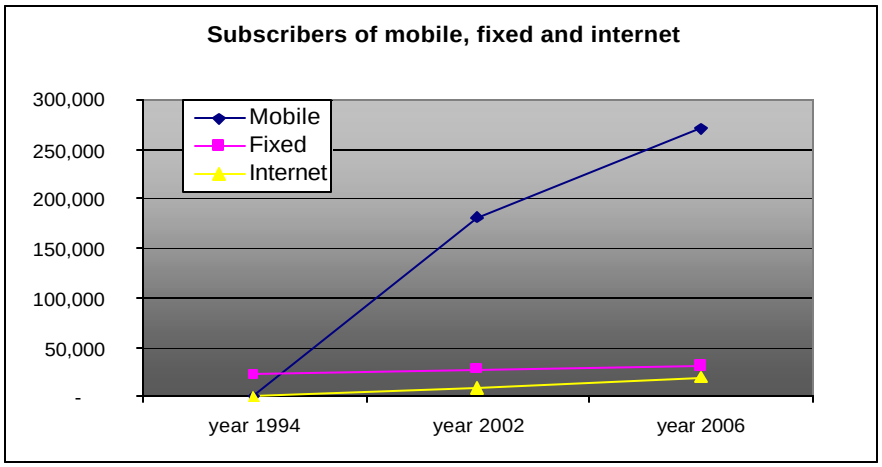
Health Sector – Summary of Results

Figure 5.8: PC usage – health sector



ICT Penetration and progress

Figure 5.9: Mobile, fixed and Internet subscribers



Chapter 6

Funding the NICI Process and critical success factors

6.0 Introduction

A number of African countries have successfully embarked on NICI processes that articulate long-term policy, infrastructure, content and application strategies as an integral part of their overall national development goals. In some cases, the development and implementation of corresponding action plans has been undertaken.

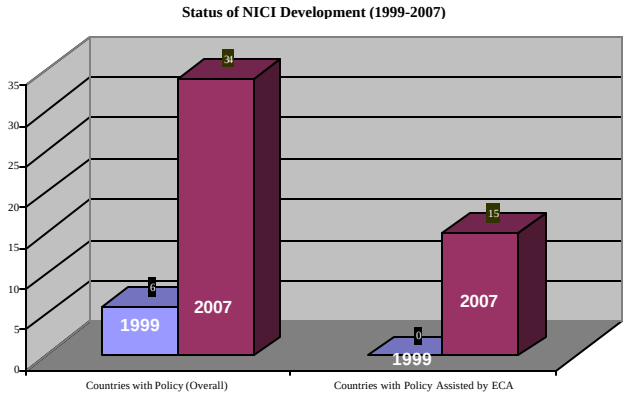
African countries engaged in the NICI process can be divided into three broad categories namely:

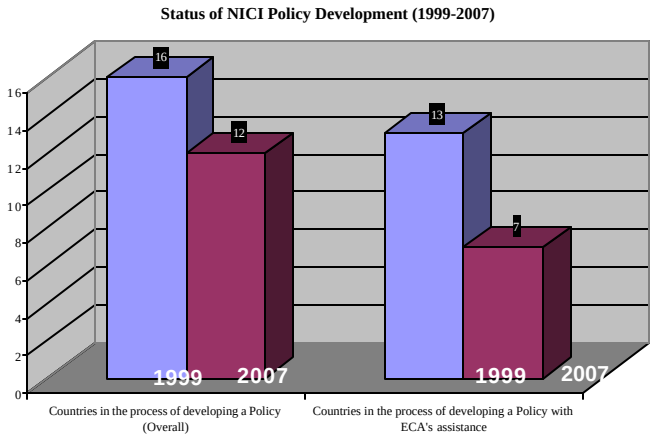
- Countries in the process of developing their national policies and plans;
- Countries that had partly completed their policy development processes and were in some cases implementing specific initiatives or sectoral projects; these included countries that are operating in a policy vacuum but implementing a number of initiatives; and
- Countries that have completed their policy and plan development processes and have embarked on the implementation process.

6.1 NICI process analysis

Prior to AISI, only six countries had developed ICT policies and it was not until ECA commenced implementing its work programme that the number of countries increased up to 15 in 2007 (figure 6.1).

Figure 6.1: Status of NICI development (1999-2007)



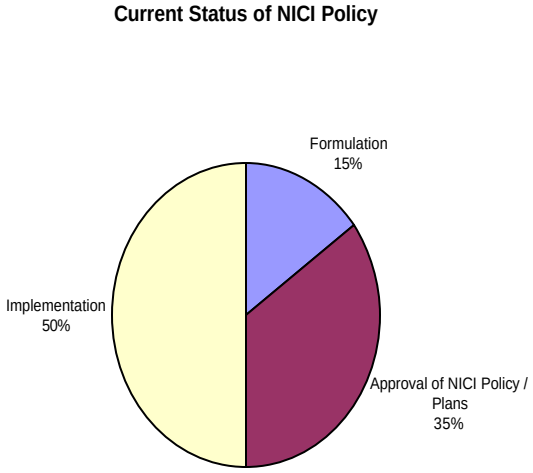


The 13 countries that had either commenced the development of their NICI policy with ECA's assistance or were working with the IDRC under the AISI framework in 1999 were, Benin, Burkina Faso, Burundi, Cape Verde, Ghana, Guinea, Ethiopia, Mali, Malawi, Namibia, Nigeria, Rwanda, Tanzania and Uganda. Consequently, ECA has supported over 50 per cent of its member States in developing their national e-strategies. Countries currently developing their policies include Chad, Cameroon, DRC, Lesotho, Sierra Leone, Togo and Gabon.

The 2006 ECA survey [25] indicated that, of the twenty respondents, 15 per cent were in the policy formulation phase, 35 per cent, in the approval of policy or plans and 50 per cent, in the implementation phase (figure 6.2). Stages and priority areas of implementation varied from country to country with Rwanda now in its 2nd NICI Plan.

[25] "Status of implementation: NICI Process analysis - ECA, 2006 (Burkina Faso, Burundi, Cameroon, Chad, the Gambia, Ghana, Guinea, Kenya, Malawi, Mali, Niger, Nigeria, DRC, Republic of Congo Brazzaville, Rwanda, Senegal, Sierra Leone, Swaziland, Tanzania and Togo).

Figure 6.2: Country status of NICI policies



Main pillars of the NICI policies

The different socio-economic development challenges faced by a majority of African countries have led to diverse approaches to Information Society development although there are in existence, crosscutting themes in almost all the countries (Appendix B). The major themes include:

Human resource development/education

African economies continue to sustain the growth momentum of previous years, recording an overall real GDP growth rate of 5.7 per cent in 2006 compared to 5.3 per cent in 2005 and 5.2 per cent in 2004. This strong economic performance has however not been accompanied by substantial gains in job creation and has not impacted on poverty alleviation or human development.[26] There is however conscious realization that human resource and skills development are central to development in a globalized, competitive environment. Human resource development (HRD) is considered critical in the development of the ICT sector and in stimulating ICT usage in other sectors. A number of governments are now persuaded that a nation's ability to fully develop an Information Society depends on the level of education of its people, which affects the ability to assimilate and to process complex information.

[26] UNECA Economic Report on Africa, Accelerating Africa's Development Prospects Through Diversification, 2007.

At the presentation of the 2007/2008 Budget in Mauritius, the Deputy Prime Minister and Minister of Finance and Economic Development, Mr. Rama Sithanen, announced:

> *"To the young people of our country, that Government, through the Empowerment Programme and in partnership with key players in the ICT industry will train and organize placements for some 5,000 SC and HSC holders for the ICT/BPO and Call Centre operations. This is an outstanding example of public private sector cooperation to address national issues".*

For African countries, according to the 2006 ECA report, one of the key gaps negatively impacting on policy process implementation and management has been the lack of capacity in critical areas broadly categorized as:

- Engineering – ICT/IT/Geo Information System experts;
- Legal experts in ICT regulation;
- Project management – expertise in Monitoring and Evaluation;
- ICT/Management Information System experts to facilitate ICT applications in socio-economic sectors; and
- R&D experts.

Legal, Regulatory and Institutional Framework provisions

The development and implementation of an enabling legal and regulatory framework and environment will support the development of the local ICT sector and ensure a competitive environment for the development and provision of services. Governments are increasingly playing their role of promoting the development and the use of ICTs in the economy and society as well as the development of the information and knowledge economy supported and facilitated by appropriate legal provisions and legislation. Inappropriate regulation has been recognized as one of the limiting factors constraining the e-economy. One of the major challenges is that of the development and implementation of policies that create a favourable climate for stability, predictability and fair competition in order to attract private investment for ICT infrastructure development and meeting of universal service obligations.

From the same ECA status report, it appears that activities to address the legal and regulatory framework are being undertaken in Burkina Faso, Burundi, Cameroon, the Gambia, Ghana, Guinea, Kenya, Malawi, Mali, Niger, Nigeria, Republic of Congo, Rwanda, Senegal, Swaziland and Tanzania as part of implementing NICI policies. As these countries are at varying stages of the ICT4D process, activities being undertaken in general included:

- Design and adoption of laws on the Information Society and bills for document validation, e-signatures, data protection, etc;
- Development of a cyber law framework;

- Institution of national ICT regulation agencies;
- Continuous training of regulators to integrate new technologies in the regulatory framework;
- Development of telecommunication policies; and
- Establishment of a public utility regulatory authority.

Private sector development

The development of the private sector, as one of the strategies to improve the economy's job creation capability, is now a priority area for socio-economic development programmes. There are efforts aimed at encouraging the private sector to pursue a more proactive role in the formulation of policy and national plans and strategies to promote the Information Society. This is with the realization that the private sector, in most cases, is well positioned to facilitate the development and implementation of various ICT applications through innovative financing schemes.

In many African countries, although the national private sector is incapable of assuming leadership of this process for varied reasons, the emergent national entrepreneurs have had a catalytic role in stimulating economic growth and participating in the development of national information infrastructure and taking advantage of business opportunities resulting from growth of the Information Society.

Governments' have acknowledged the need to create the necessary enabling environment and incentives to facilitate the role of both the domestic and foreign private sector as a key partner in the nation's development. In Rwanda, private sector development is one of the six pillars of the Vision 2020 that establishes the country's development objectives for the years' 2010 and 2020.

Physical infrastructure development

The prerequisite for creation of an information-based economic structure is the existence of an efficient information infrastructure and services. In spite of efforts made to date by most African countries to create the necessary environment for ICT development, a majority continues to face challenges relating to the availability, quality and affordability of ICT infrastructure. Although the basic infrastructure to connect to the global information network exists in some countries, affordable and equitable access remains a critical issue for economic empowerment and FDI attraction.

ICT diffusion is also often limited to urban areas, thus disadvantaging the population in the rural areas. Network rollout is not usually coordinated with other strategic infrastructure development initiatives thus foregoing the attendant benefits associated with collocation of infrastructure. Adoption and diffusion of ICTs is also hampered by lack of access to reliable sources of electricity, as grid penetration to rural areas is low. Remote areas, and in some

cases urban areas, are characterized by irregular/intermittent or non-existent electricity supplies.

To ensure appropriate utilization of ICTs in all sectors of the economy so as to facilitate sustainable social and economic development, several governments' have prioritized ICT physical infrastructure development, including programmes that address energy deficiencies.

Infrastructure activities being undertaken in several surveyed countries include:

- Building of national ICT infrastructure backbone (laying of fibre optic cables) - expansion of the fixed network (optical fibre) as well as the transport infrastructure for data communications;
- Expansion of the mobile network to under-serviced areas;
- Power/energy supply projects;
- Improvement of the rural service access through the creation of the Universal Service Fund; and
- Promotion of network expansion by private operators.

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Capacity to implement: financial resources

Countries generally face a number of socio-economic developmental challenges characterized by low growth rates, poor infrastructure development, heavy debt burden as well as perennial epidemics. These developmental challenges inadvertently require substantial financial resources to address, and this has tended to relegate the ICT4D agenda to the lower rungs of the resource prioritization ladder. This has negatively impacted on the capacity to implement and the translation of policy into plan implementation is occurring at a snail's pace.

On the allocation of funds for 1st NICI Cycle implementation, only 55 per cent of governments' allocated part of their national budgets for ICTs (figure 6.3). These countries include Burkina Faso, Ghana, Kenya, Malawi, Mali, Niger, Nigeria, Republic of Congo Brazzaville, Rwanda, Senegal and Tanzania, according to the ECA status report. The method of allocation was either through directly allocation to the lead Ministry or as a portion of the general budget distributed across the board to all the Ministries (figure 6.4).

However, upon closer examination of specific ICT budget allocations in some African countries, it is clear that the amounts allocated to the ICT sector not only represent a small percentage of the total budget, but are also a fraction of allocations to the other sectors. This allocation is often inadequate to meet demand and this has resulted in the need to solicit for funds from other sources as represented by the 45 per cent in figure 6.3.

Figure 6.3: Allocation of funds for 1st NICI Cycle implementation

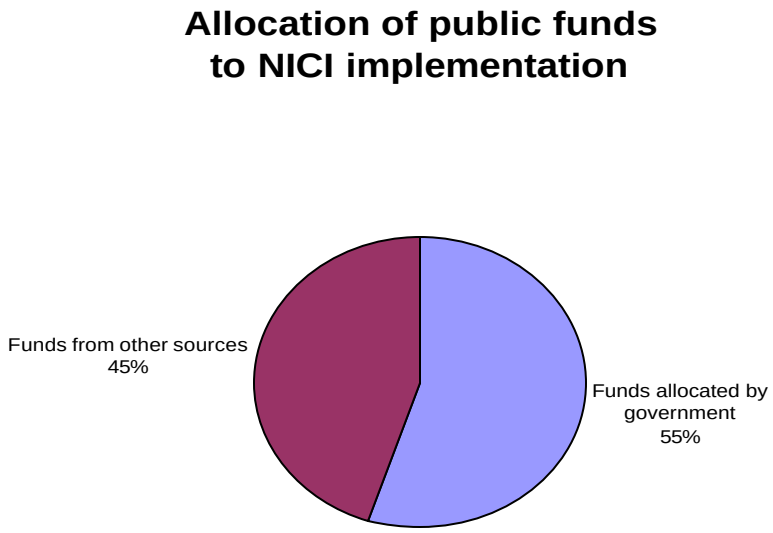
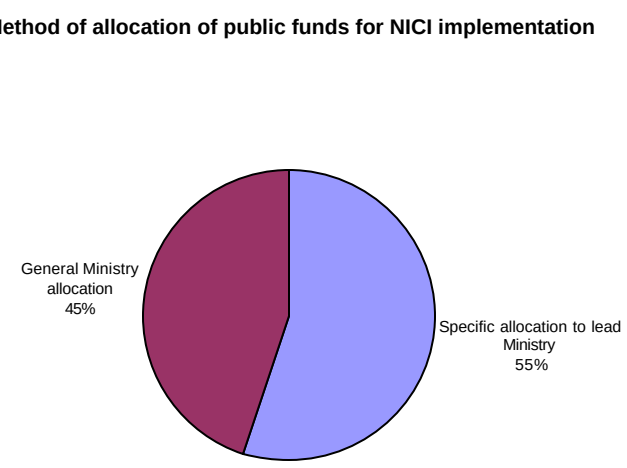


Figure 6.4: Method of allocation of public funds for 1st NICI Cycle implementation



During the financial year 2005/2006, ICT sector allocations, as a percentage of the total budget for the following countries were, South Africa (0.28 per cent), Mauritius (1.89 per cent), Botswana (1.27 per cent), Ghana (0.07 per cent) and Lesotho (1.47 per cent). In the Ghana 2007 budget,, there has been an increase to 0.38 per cent. With due consideration of the programmes detailed in the ICT4D Plan, there will be funding gaps in the process of realizing the plan.

The "total resource envelope for the 2007 budget is projected at ¢54,315.9 billion ($6 billion), and an amount of ¢207,682 million ($23 million) has been allocated to the Ministry to carry out its activities in 2007, from Government of Ghana, ¢60,283 million ($7 million), IGF, ¢0,856 million ($94), donors, ¢126,543 million ($14 million) and HIPC, ¢20,000 million ($2 million)."[27]

In the 2006/2007 budget, for Botswana, the allocation is 2.75 per cent of a proposed development budget of P5.8 billion ($1.2 billion).

[27] Budget Statement and Economic Policy, 2007: Growth with Stability – Ghana.

"The remaining P894 million ($195 million) or 15 per cent of the total development budget is shared among Ministries with the Communications, Science and Technology Ministry allocated, P154 million ($ 33 million)."[28]

There is clear evidence of the importance of ICTs in delivering sustainable economic development. Investments in the sector offer opportunities for employment generation, creation of new sources of innovation and enhancement of industrial competitiveness. Inadequate funding has resulted in uncoordinated activities and isolated islands of technology. Governments, not only play a unique role in the diffusion of ICTs, but are also leading consumers of ICT products and services. It is therefore imperative that the correlation between ICT investment and positive economic results is recognized. ICT investments produce impacts that can be measured in three quantitative ways, contribution to Gross Domestic Product (GDP), productivity and employment.

In the Gambia, during 2006, real GDP grew by 7.7 per cent. The 2007 Budget speech stated:

"*The Communications Industry registered the highest growth of about 18 per cent. The growth in communication is attributed to expansion of telecommunications activities and the rapid internalization of ICT activities nation wide. National policies will continue to facilitate development within the ICT Sector to ensure faster socio-economic development, and optimize benefits from globalization."*[29]

From the foregoing, it is clear that the potential of ICTs to transform social and economic activities and ways of working is recognized. Sustained investment in the sector is key, as seen in Mauritius where investment in the ICT sector, a key pillar of the economy, has led to increased growth, despite the decrease to a 0.5 per cent, allocation, about 314,913,000 rupees ($10 million), from a total budget 60 billion rupees ($2 billion).

The Ministry of Information Technology and Telecommunications (MITT) is finalizing a comprehensive 5-year National ICT Strategic Plan (NICTSP) to implement the Government's strategy to make the ICT sector the fifth pillar of the Mauritian economy, position Mauritius as a regional ICT hub and provide equal ICT opportunities to citizens. The NICTSP will set the framework for Government intervention along the following main priorities:

- Promote development of the ICT industry (both for domestic and export uses; and
- Leverage the use of ICTs within Government and for government services to businesses and citizens (e-government).

Growth is on a rising path. Foreign direct investment is flowing in at an unprecedented rapid pace. .. the ICT sectors are doing well."[30]

[28] Budget speech, 2006 - Republic of Botswana.

[29] Budget speech 2007 – Gambia, Programme-based budgeting for efficient resource allocation and use with a Poverty reduction dimension.

[30] Budget Speech 2007/8 – Mauritius: Consolidating the transition and securing full employment.

For other countries, the government contribution, albeit small, is across all Ministries and is embedded under administration that is complex to quantify. The Government of Rwanda established a set of quantified development objectives for the years 2010 and 2020 in the Vision 2020 document. The Long-Term Investment Framework (LTIF) led by the Ministry of Finance and Economic Planning (MINECOFIN) to support Vision 2020 has been built on the six pillars of the Vision, which are:

- Good governance and a capable State;
- Human resource development and a knowledge-based economy;
- Private sector led development;
- Infrastructure development;
- Agri-business development; and
- Regional and international integration.

In addition, the framework considers three "cross-cutting" development issues, namely gender equality, natural resources and the environment; science, and technology, and ICT. In the 2007/2008 Budget, this is translated into a visible and significant ICT allocation, not only in the parent ministry, but also distributed across all ministries, clearly indicating government's resolve to push the ICT agenda forward.

Box 6.1: Rwanda cited as an ICT success story in East Africa

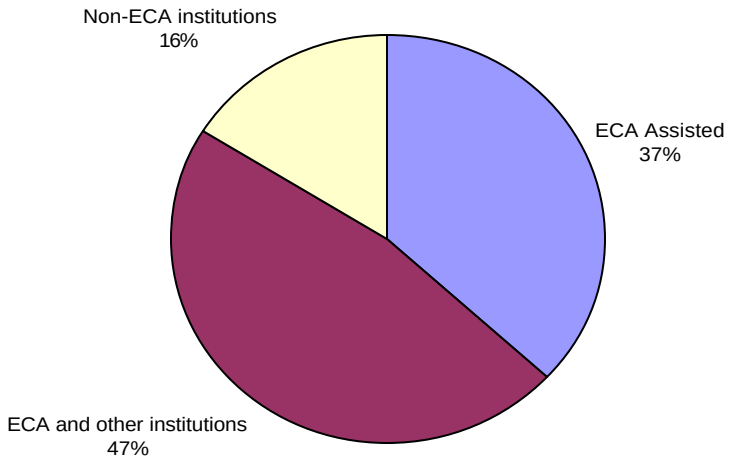
Rwanda has been named East Africa's number one ICT nation by the United Nations Conference on Trade and Development (UNCTAD). According to UNCTAD, the country's current ICT sector budget is at par with nations of the Organization of Economic Cooperation and Development (OECD), a grouping of 30 rich nations, at 1.6 per cent, far above the African average.

Source: http://www.ceprc.ca/africa/africa_e.html

The funding gap in a number of countries has in most cases been filled through the active involvement of partners as shown in figure 6.5. According to the ECA, 2006 survey, 37 per cent of the countries received ECA assistance in the NICI process, while another 47 per cent from ECA and other institutions, including UNDP, World Bank, EU, and French Cooperation, among others. Sixteen per cent was received independently from other institutions including UNDP, EU, and UNESCO.

Figure 6.5:

Involvement of partners in the funding of the NICI process



It is important that governments adequately commit financially to realize the benefits of the Information Society Innovative and financing mechanisms should be explored (e.g. PPP's, BTO's, BOT's, BOO's, BOOT's etc) and these should include leaning on best practice approaches, especially from within the continent, in view of similar challenges.

Prioritizing policy implementation: Focus on infrastructure development

Most of the countries surveyed indicated that in policy implementation, significant progress was being registered towards addressing the cross-cutting ICT infrastructure theme, more than in any other pillar (table 6.1). Although governments' financial contribution to ICT sector has generally been inadequate in most cases, a number of countries have instituted programmes addressing infrastructure deficiencies - the prerequisite for the creation of an information-based economic structure.

In Uganda, the Government has recognized the role of ICT in national development and transformation programmes. In the financial year 2007/2008 budget statement, the priority area that will have the first call on all new resources is ICT, Science, Technology and

Industrial Development. The full liberalization of the telecommunications sector has led to more investors in the sector. The Government has embarked on a National Data Transmission Backbone which links districts using fibre optic cable to high-speed connectivity for both voice and data exchange. The project also includes the linking of all Government Ministries and agencies using fibre optic technology.

"The 2007/2008 budget includes Shs. 5 billion ($3 million) to fund the construction of a National Data Transmission Back Bone to enhance Uganda's domestic fibre-optic network and wireless capability. This counterpart funding will supplement a $30 million loan from the Peoples' Republic of China"[31] *(10 per cent counterpart funding).*

Box 6.2: Infrastrucure deployment: Uganda Telecom

French based Alcatel-Lucent last week entered into a $20 million (Ush 35.6 billion) contract with Uganda telecom to increase the latter's network and over all service quality.

Providing hardware, software, and services to telecom service providers and enterprises in over 100 countries, the company will extend Uganda telecom's GSM/EDGE mobile network and deploy the first third-generation (3G) UMTS/HSPA network in the country.

"The enhanced network will enable Uganda telecom to expand its service offerings with high-quality, mobile voice and high-speed broadband data services such as video streaming, access to corporate e-mail and intranets and many other new applications that can help generate additional revenue," a joint statement issued after the Kampala signing said.

The new systems will be ready and capable of handling the needs of both existing customers and guests at the Commonwealth Heads of Government Meeting to be held later this November in Uganda.

All three active mobile telecoms providers in the country have over the last two quarters invested substantial resources into enhancing their communications infrastructure.

About two months ago, Uganda telecom contracted Chinese high-tech enterprise, Huawei Technologies at a cost of $50 million (Ush 89 billion) to augment its GSM network to 70 per cent national coverage by November. (East African Business Week, 27/08/07):
http://www.busiweek.com/index. php?option=com_content&task=view&id=3922&Itemid=9

In the Gambia, ICT continues to be a catalyst for socio-economic development and the Government has established a new ICT Directorate to implement Government's priority policies and strategies. The Government has embarked on a number of equipment and infrastructure projects at a cost of $10 million, both in the short- and medium-terms, with the objective of providing country-wide universal access, and the enabling environment, to promote operator competition, thus satisfying the high expectations of customers.

In Kenya, the Government intends to develop and support an efficient ICT infrastructure and facilitate the completion of the ongoing ICT infrastructure expansion in order to improve broadband connectivity, whilst also providing easy access to international and national networks. This will be achieved through investment in an undersea fibre optic cable and the development of a National Fibre Optic Network.

[31] Budget speech Financial Year 2007/2008 - Uganda, Theme: Re-orienting Public Expenditure Towards Prosperity For All.

In his 2007/2008 budget speech statement, Kenya's Minister of Finance stated, *"I have allocated KShs.1.0 billion ($ 15 million) towards The East African Marine System (TEAMS) project, whose completion by mid next year is expected to provide cheaper and faster Internet connection with the rest of the world."*[32]

In Botswana, the draft Information and Communications Technology Policy to be presented to Parliament recommends appropriate legal and regulatory changes critical for the realization of an e-business environment and e-government services. The major initiative will be the 'connecting communities' project, which will involve the provision of ICT access points in rural areas across the country.

In Ghana, the Ministry of Communications is pursuing a vision that will transform *"Ghana into a country with a reliable and cost effective world-class communications infrastructure and services."*

Box 6.3: Infrastructure requirements for 2010 - South Africa

South Africa is expected to spend about R5 billion on information and communication technology (ICT) infrastructure in preparation for the Fifa World Cup event in 2010, according to a report quoted by a local organising committee (LOC) official. Speaking at a media forum at Wits University's Link Centre, the technology manager for the LOC, Zakes Mnisi, said that based on the commitment made by stakeholders such as the government, cities and the private sector so far, South Africa had passed R2 billion ICT investments. Mnisi said Fifa had appointed an international technology company Match to develop a software system for event management and also for services such as accreditation and travel. He said the LOC was still in discussions on whether it would appoint a local technology partner. So far, Telkom, MTN and First National Bank are among the companies that have been appointed as ICT partners for the event. The SABC will provide broadcasting services for the local market.

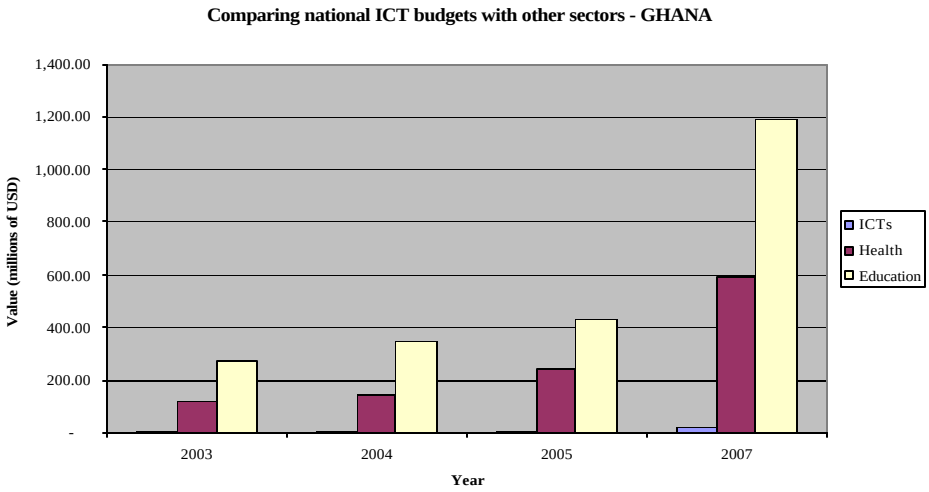
The ICT infrastructure includes broadband rollout and there has been wide speculation that South Africa was running out of capacity, as was the existing undersea cable Sat3, which is co-owned by Telkom. The government is planning a $700 million (R5.25 billion) investment to build a cable linking South Africa with Europe and South America. Another cable, the Nepad Broadband Cable, will connect South Africa with east African countries and Europe. Both cables are expected to be in operation before 2010. As one of the host provinces, Gauteng was planning an estimated R7 billion investment to roll out a broadband network.

Gauteng MEC of finance, Paul Mashatile, said the province was positioning itself to meet the broadband demand to ensure that there was capacity and lower telecoms costs. http://www.busrep.co.za/index.php?fSectionId=561&fArticleId=3987473

A comparison of ICT budget allocations with other sectors indicated a huge discrepancy between country priorities. Responses to the statement: "Information and communications technologies (ICTs) are an overall priority for the government" (1 = strongly disagree, 7 = strongly agree) yielded impressive responses, which are not however reflected through budget commitments (ECA, 2006).

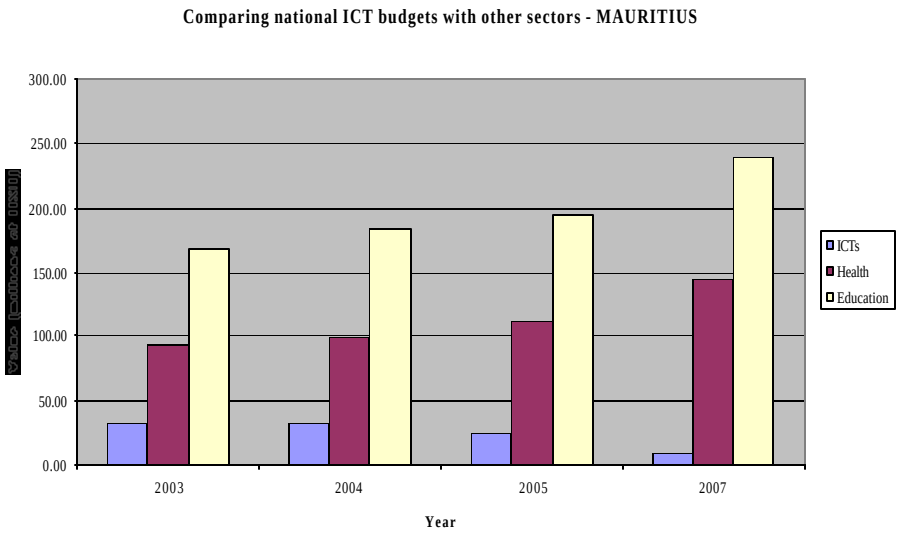
[32] Budget Speech 2007/2008 – Kenya, Hon. Amos Kimunya E.G.H., M.P. Minister of Finance, 14 June 2007.

Figure 6.6: Budget comparisons - Ghana



For Ghana, although the budget for the health and education sectors continue to increase, the ICT allocation decreased between 2003-2005 and registered a small increase (0.38 per cent) in 2007. This upward trend should help to foster realization of the comprehensive ICT4D Plan (figure 6.6).

Figure 6.7: Budget comparisons - Mauritius



Similarly, budget allocations for the education and health sectors in Mauritius have been increasing through the review period (figure 6.7). The ICT allocation is much lower in comparison and there is a decrease for 2007 although from the 2007/2008 budget statement, *"total investment in 2006 increased by 18.2 per cent compared to a decrease of 2.4 per cent in the previous year. These investments are more diversified flowing in most key sectors including…ICT. In 2006, FDI inflows amounted to 7.2 billion rupees, ($ 232 million) exceeding the FDI inflows for the four previous years."*

The ICT sector is mature and private sector efforts continue to complement government's vision of eventual transformation into an intelligent island and a hi-tech India, Africa and Europe hub providing innovative business solutions. Due to attractive fiscal incentives, more than 300 companies are operating in the ICT sector in Mauritius. These companies are involved in a wide range of activities, including software development, call centres, Business Process Outsourcing (BPO), web-enabled services, training and networking. Other support services companies, mostly foreign-owned, are presently servicing the European and US export markets.

NICI Process critical success factors and conditions

NICI Cycles in African countries have resulted in a number of lessons and best practices in a number of areas. The process on the continent has also yielded invaluable lessons in the area of the critical success factors and conditions necessary for the success of the NICI process.

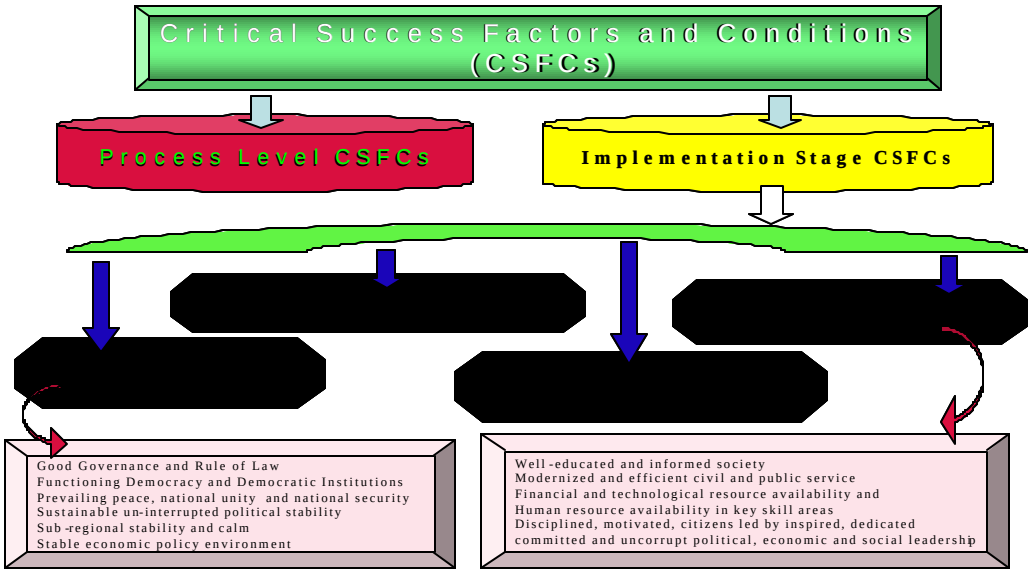
A key lesson is that the development, deployment and use of ICTs within the economy and society can contribute to and accelerate the socio-economic development process of Africa provided some critical success factors and conditions (CSFCs) are addressed at all levels. ICTs cannot have an appreciable impact on the developmental process unless these CFSCs are addressed. As illustrated in figure 6.8, two broad types have been identified:

- Process Level Critical Success Factors and Conditions (P-CSFCs) - necessary for the success of planning for the NICI process in African countries; and

- Implementation Stage Critical Success Factors and Conditions (I-CSFCs) - necessary for the success of the implementation of the NICI policy and plan in these countries.

The I-CSFCs provide the necessary conducive environment within the society and economy for ICTs to have an appreciable impact on the socio-economic development process of any given African country, at both the policy and plan formulation stage and at the actual implementation stage. The details of each of each type are summarized in figure 6.8.

Figure 6.8: Critical Success Factors and Conditions



The Process Level Critical Success Factors and Conditions (P-CSFCs)

These include:

- An active high-profile national ICT champion such as the President, Vice-President or Prime Minister;
- Other top-level political and economic leadership, support, commitment and championship of the process;
- A clear national NICI (ICT4D) vision, mission and strategies process to guide the formulation and development of the desired outputs and the corresponding policies, initiatives and programmes designed to implement the policy;
- Government endorsement and commitment to the national ICT4D vision, mission and strategies;
- The goodwill and support of the people and their endorsement of the need for ICT4D;
- A strategic government ministry to facilitate and coordinate the process on behalf of the government;
- Dedicated policy decision makers and professionals, cutting across the public and private sectors, who are committed to the process;
- Adoption of a well scheduled step-by-step approach with specific milestones and deliverables during policy and plan development;
- Identification and setting of realistic objectives and targets achievable within a given time frame;
- A well researched process that made an effort to learn from the experiences of other countries;
- Nation-wide policy and plan development consultative exercise involving key stakeholders within the public and private sector to facilitate across-the-board contributions and inputs into the process and its deliverables;
- Continued dialogue sessions with key stakeholders, namely, government, private sector and civil society;
- Logistic support and facilitation of the process; and
- Sustained steering and leadership from the top for action and results.

The Implementation Stage Critical Success Factors and Conditions (I-CSFCs)

These include:

- A conducive enabling environment for facilitating the implementation of the policy and plan;
- National support, leadership and championship targeted at facilitating the implementation process;
- Suitable organizational and institutional-level support to implementation; and
- Presence of enabling environment CSFCs to facilitate the plan formulation and implementation.

Enabling Environmental Critical Success Factors and Conditions

Three types of Enabling Environment CSFCs have been identified:

- Governance and socio-political enabling environment;
- Socio-economic development framework enabling environment; and
- Legal, regulatory, institutional and environment CSFCs.

Governance and Socio-political Enabling Environment CSFCs

- Good governance and rule of law;
- Functioning democracy and democratic institutions;
- Prevailing peace, national unity and national security;
- Sustainable uninterrupted political stability;
- Subregional stability and peace; and
- Stable economic policy environment.

Socio-economic Development Framework Enabling Environment CSFCs

- Sound socio-economic development framework for setting policy and priorities;
- Stable economic liberalization environment; and
- Stable economic investment climate.

Legal, Regulatory and Institutional Environment CSFCs

- Relevant legal and legislative provisions to support NICI;
- Enabling regulatory environment necessary for implementing specific NICI components;
- Institutional structures and mechanisms to facilitate and support the policy and plan development and the implementation.

National Support, Leadership and Championship CSFCs

- Top-level political leadership commitment and championship of NICI;
- A core group of dedicated senior level decision makers and professionals within the public and private sector that promotes and supports NICI within their respective organizations, institutions, business establishments and entities; and
- Across-the-board stakeholder commitment to the NICI vision and the mission and strategies for achieving this.

Organizational and Institutional CSFCs

- Required changes in relevant organizational and institutional structures and procedures for effective deployment and use of NICI initiatives within these organizations;

- Changes in unproductive attitudes to work, duty and service that could hinder the effective deployment and use of ICTs to improve organizational efficiency, productivity, activities, operations and service delivery; and
- A motivated, disciplined and adequately remunerated work force committed to bringing about the necessary organizational changes conducive to effective deployment and use of ICTs within their organizations and institutions.

Facilitating Environment CSFCs

- Well-educated and informed society;
- Modernized and efficient civil and public service;
- Financial and technological resource availability;
- Human resource availability in key skill areas;
- Disciplined, motivated and patriotic citizens; and
- Non-corrupt, inspired, and committed political, economic and social leadership.

Chapter 7

Towards the Knowledge Economy (KE)

7.0 Introduction

In today's global, information-driven society, economic success is increasingly based on the effective utilization of intangible assets such as knowledge, skills and innovative potential as key resources in gaining comparative and competitive advantages. Knowledge has become the important driving force of economic growth in the advanced economies. The global knowledge economy is characterized by knowledge-intensive industries, producing goods and services for each and every sector. The capacity of industries and countries to manage knowledge assets has become a major determinant of economic growth and competitiveness. The knowledge economy provides an excellent tool for achieving faster development in the globalizing world. In order to fast track the building a successful knowledge economy, the following are necessary:

- Strong political will on the part of the government;
- Focusing on a clear long-term knowledge economy goal - development of a competitive market-based innovation system;
- Fostering communication, networking and coordination among the different public and private actors in the economy and their development strategies; and
- Measurement and analytical tools for policy development in the area of KE.

Information technology production, dissemination and use have become crucial for enhancing economic growth, and competitiveness. A knowledge-based economy is one in which organizations and people efficiently acquire, create, disseminate and use knowledge for specific economic and social gains.

For improving the competitiveness of industry and its sectors in a knowledge-based economy, the impact of ICT for the acceleration of productivity growth is recognized. The diffusion and uptake of new ICTs has resulted in enhanced growth and productivity of the economy and created global markets for goods and services. Information and knowledge-based economies are often characterized by widespread deployment and use of ICTs within the society to support, for example, the delivery of educational, health and other social services. For improving the competitiveness of industry and its sectors in a knowledge-based economy, the impact of ICT for the acceleration of productivity growth is recognized.

Emerging information and knowledge-based economies (economies directly based on the production, distribution and use of knowledge and information) are characterized by modern educational systems and targeted investment in cutting-edge R&D. Innovation in products, processes and organizational structures is a major source of growth and is a result of numerous interactions by a community of actors and institutions. Higher levels of R&D are

correlated with higher levels of economic performance and the importance of R&D cannot be overlooked, as economies become more knowledge based. Countries which have taken the lead, are reaping the benefits of R&D potential and accelerated innovation and taking advantage of emerging global markets.

Employment in the knowledge-based economy is characterized by an increasing demand for more highly skilled human resources for developing and maintaining a competitive edge on the global market. Educated and skilled human resources or human capital (the skills embodied in workers) become the most valuable asset and a central pillar in development and growth. The challenge for Africa is that, while knowledge and information may be abundant, the capacity to access and use them in meaningful ways is usually scarce.

Box 7.1: An information and knowledge economy

- An information and knowledge economy is likely to be:
- An economy characterized by a large commercial service sector with a reasonably large and vibrant ICT service sub- sector and industry;
- An economy characterized by a technology-based knowledge-driven industrial sector;
- An economy in which the majority of the working population is either directly or indirectly involved in information and communications related activities;
- An economy with a modern, efficient and competitive agricultural sector;
- An economy in which a reasonable large proportion of the population has access to ICT products and services;
- An economy in which the provision and delivery of goods and services of the key sectors of the economy are to a large extent facilitated by information and communications technologies;
- An economy in which the provision and delivery of services by government and its administrative machinery are to a large extent facilitated by ICTs;
- An economy based on an advanced and reliable national information and communications infrastructure; and
- An economy based on a literate society with a high proportion of computer literates.

Reliable access to critical information and knowledge is the basis for human development. Capacity development and empowerment at the individual and institutional levels depend on the ability to create, share and apply knowledge. Without examining and addressing the expertise and skills base that exist in Africa, the continent will not be able to take advantage of the benefits of the knowledge economy.

7.1 Relationship between NICI and KE

The AISI provides the roadmap to guide African countries in addressing the challenges of the emerging globalization and the information age by developing and implementing NICI policies and plans set within the wider national socio-economic development objectives, strategies and aspirations of their respective countries. The NICI framework provides incentives to accelerate ICT diffusion, business adoption and instilling confidence amongst users. As countries continue to witness the shift from industrial to post-industrial knowledge-based economies, policies, particularly those relating to ICT, science and technology, industry and education, will need a new emphasis in knowledge-based economies. The

development of a knowledge economy and knowledge-based society places new opportunities and challenges to policy makers in Africa.

Making effective use of knowledge for development requires developing appropriate policies, institutions, investments, and coordination across four pillars/functional areas of a knowledge-based economy as identified by the World Bank, 2005[33]. The developed NICI policies and plans in most African countries have focused on similar priority areas/pillars and it is imperative that countries formulated comprehensive knowledge-based strategies which foster creative knowledge based activities.

Policies reflecting the emergence of KE

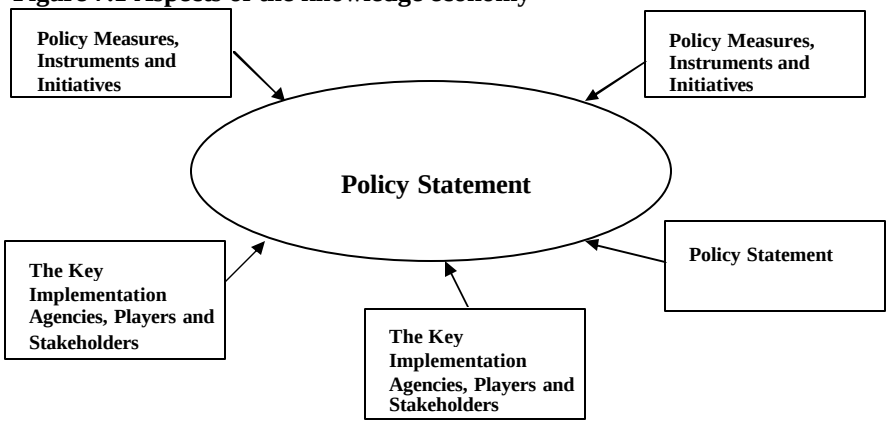
In a survey conducted by ECA (ECA, 2006) to determine the status of ECA supported NICI policies and plans in various African countries, the capacity of countries and activities towards building a knowledge economy was analyzed thus:

Seventy per cent of respondents indicated that their NICI policy reflected the emergence of the knowledge economy - Burkina Faso, the Gambia, Ghana, Guinea, Kenya, Malawi, Mali, Niger, Nigeria, Republic of Congo Brazzaville, Rwanda, Senegal, Sierra Leone and Tanzania. Some of the countries acknowledged that even though the NICI policy goals reflected the KE, not much ground had been covered on the economic and institutional regime to stimulate the effective creation and use of knowledge. Some of the initiatives cited as stimulating the knowledge economy were in the areas of e-government, creation of techno parks, training of all citizens, revising the legal texts for facilitating e-commerce, access to public markets, banking and financial services etc (figure 7.1).

Online government information and services and online government procurement should be part of broad government knowledge management strategies to improve efficiency and increase reach whilst providing public demonstration and diffusion effects.

[33] Derek H. C. Chen and Carl J. Dahlman, "The Knowledge Economy, the KAM Methodology and World Bank Operations, The World Bank, October 19, 2005.

Figure 7.1 Aspects of the knowledge economy



Comprehensive strategies need to address the following four key areas:

1. **An economic and institutional regime that provides incentives for the efficient creation, dissemination and use of existing knowledge (enabling legal and regulatory environment)**

Carl J. Dahlman, 2005[34] identifies some of the key elements of the economic and institutional regime that are necessary to stimulate the effective use of knowledge as well as its creation as:

Rule of law - a clear rule of law that respects individual and commercial rights and that is enforced consistently and fairly is a very important prerequisite to promote the more effective use of knowledge.

Intellectual property rights – it is necessary not only to accord intellectual property rights over the creation of new knowledge to those who exert the effort to produce it, but also to provide incentives for the effort. It is important to protect indigenous knowledge against appropriation and patenting by foreign concerns and to develop appropriate mechanisms to compensate the original owners of that knowledge when it is industrialized.

Competition - competition is critical to stimulate the creation as well as the effective use of knowledge because these require effort and resources.

[34] Carl J. Dahlman, Knowledge for Development, the World Bank Institute.

Openness to international trade - this is important because of the pressure it exerts on domestic producers to improve performance. It is critical to access global knowledge through the import of goods and services that embody some of that knowledge, through direct foreign investment, technology licensing and through electronic means and direct access to research and databases on the Internet.

Financial markets - The financial system and the key institutions and rules that regulate it are the "brains" of a knowledge-based economy because they process information to allocate scarce capital to the most productive areas.

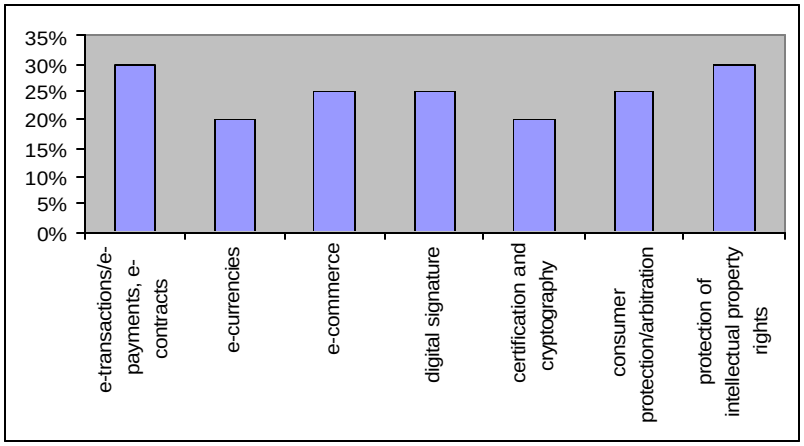
Labour markets and social safety nets – labour markets must be flexible to re-deploy workers from declining industries to growth industries. This necessitates the need for reliable labour market information as well as mechanisms for facilitating the retraining of labour so that the workers will have the skills required in the new jobs.

Governance and accountability - at the institutional level, affective governance mechanisms will have to be established to cope with the demands for constant restructuring, redeployment and adjustment.

The ECA, 2006 survey referred to above revealed that there were significant gaps in the legal and policy regimes of the respondent countries as reflected through the level of enactment of legislation for regulatory frameworks on e-transactions/e-payments, e-contracts, e-currencies, e-commerce, digital signature, certification and cryptography (figure 7.2). The legal challenges posed by e-commerce require legislative intervention and removal of some of the barriers set by existing laws now rendered obsolete by modern technological developments. Countries such as Mauritius, Egypt and South Africa have enacted appropriate laws on data security, protection of intellectual property.

Figure 7.2 Enactment of legislation for regulatory frameworks

(Burkina Faso, the Gambia, Ghana, Guinea, Kenya, Malawi, Mali, Niger, Nigeria, Republic of Congo Brazzaville, Rwanda, Senegal, Sierra Leone and Tanzania).



Box 7.2: Building an enabled environment for E-commerce in Egypt

A key development in creating an enabling environment for e-commerce was the creation of a governmental body to represent the industry, and regulate the use of e-signatures. The conceptual and legal framework of an IT Industry Development Agency (ITIDA) was developed in MCIT and became law in April 2004- Law 15/2004, generally referred to as the e-signature law.

During 2004/2005, the proto-ITIDA and MCIT worked on developing the executive regulations for the e-signature law, setting the standards that would make electronic transactions secure and internationally valid, thus supporting e-commerce in Egypt, making it possible to use the Internet to make legal contracts.

The e-Signature Law also authorizes Public Key Infrastructure (PKI) technology, and this was first used for e-payments on a trail basis in 2005 through Egypt Post outlets.

In the second half of 2005, ITIDA began operating as an independent governmental organization under the leadership of a Board of Directors, half of whom come from the private sector and the other half from government agencies.

ITIDA has three mandates:

- Activation of the e-signature law;
- Protection of IT -related intellectual property rights (IPR); and
- Supporting an export- oriented IT industry and skilled manpower development.

Current activity within ITIDA, with regard to e-signatures is to develop the rules for a Root Certificate Authority (Root CA) that will issue digital certificates to subordinate Certificate Service Providers (CSP) to provide the proper infrastructure for the use of E-Signature in Egypt.

A limited number of CSPs will then be licensed by ITIDA to issue digital certificates and corresponding electronic signatures for citizens and private sector companies' clients. ITIDA is responsible for auditing Information Security Management Systems ("ISMS") within any licensed CSP to ensure best practice of online security controls.

Another important duty that Law 15/2004 emphasizes is the establishment of an ICT Industry Ombudsman within the ITIDA framework. This unit is set up to deal with complaints related to e-signature services and act as mediator between disputing parties as disputes resolution by traditional legal means is often too time consuming to serve the needs of the modern IT industry.

ITIDA will offer technical counseling to disputing parties, dealing with complaints related to the use of e-signatures and electronic transactions. An expert committee will be formed to review international arbitration models and other dispute resolution mechanisms and the committee's recommendations are expected to lead to an IT industry disputes resolution mechanism.

Under ITIDA's second mandate, it is required to undertake intellectual property rights registration and protection for original versions of computer software and databases under IPR law 82/2002 through the IPR Office of ITIDA which carries out this function. Raising Awareness on the importance of respecting copyright laws is another function which ITIDA undertakes, and includes promoting the use of open and free-source software, in recognition of financial difficulties for small businesses and low-income individuals who are unable to pay for branded software.

ITIDA's third mandate, supporting an export- oriented IT industry and skilled manpower development, entails supporting the implement ation of the IT Industry Development Plan developed in partnership with the industry stakeholders. Specifically, the Plan aims at ICT sector exports of $1.1 billion by 2009 and it sets out an e-commerce framework that will allow international markets to thrive and will attract more multinationals to locate in Egypt.

2. An educated and skilled population that can use knowledge

The shift towards knowledge economies has resulted in knowledge intensive industries requiring the requisite skills base, the right workforce or 'knowledge workers' that can deliver the knowledge age and economy. This calls for policies which promote broad access to skills and competencies and especially the capability to learn and ICT literacy. This includes providing broad-based formal education, establishing incentives for firms and individuals to engage in continuous training and lifelong learning in order to facilitate continuous learning and re-skilling thereby matching labour supply and demand in terms of skill requirements.

For Rwanda, competitiveness on national, regional and global markets *"will rely on adequate and rapid investment in specific high-quality human capital, especially in sciences and technology."*[35]

According to a Report on the Economic Impact of ICTs on Trade Among SMMEs in South Africa[36], *"the limited use of the Internet by SMMEs was attributed to high cost of Internet service (25 per cent of the respondents believed that affirmed this ….. However, limited usage could also be explained by inadequate skills."*

However, according to the same report, *"the skills gap is finally being acknowledged and addressed more aggressively. Research has shown that there are many more ICT generalists than specialists. ICT skills in demand in SA include Java programmers and salespeople with strong IT solutions experience, IT managers and systems, IT auditing, and call centre agents."* (Sunday Times, Business Times, Careers, 29 Oct 2006).

In Kenya, a similar study[37] revealed that there was *"low usage of ICT in businesses in the SME sector and…that low penetration was due to low awareness of the business value of ICT among the business leaders and entrepreneurs. Training of business leaders on the value of ICT will be necessary"*. The study also concluded that *"it is not the legislation or even lack of ICT policy that is stopping businesses from using ICT to facilitate trade. It was simply lack of firm-level ICT strategy and IT education of the business leaders."*

[35] Rwanda: A long-term Investment Framework an abstract, 2006.
[36] Report on the Economic Impact of ICTs on Trade among SMMEs in South Africa, M. Socikwa and N. Sunker, 2006 (Commissioned by ECA).
[37] Trade and Economic Growth in Kenya: The Strategic Role of Information and Communications Technology (ICT), M. Wagacha, M. Kashorda, 2007 (Commissioned by ECA).

3. **An efficient innovation system consisting of research centres, universities, think tanks, consultants, firms and other organizations that can tap into the growing stock of global knowledge, assimilate and adapt it to local needs and create local knowledge**

Support to innovation will need to be broadened to include diffusion-oriented programmes. ICT diffusion and use are increasingly recognized to have major impacts on efficiency and productivity performance. The diffusion of new technologies and the development of information infrastructures can be facilitated through the provision of a framework for dialogue and collaboration among different actors, government, academia, industry and consumers. The bottom-up consultation approach of the NICI development process is ideal for accurately identifying and matching industry priorities with policy objectives and possibilities.

Governments need to recognize and acknowledge the importance of innovation systems by increasing public R&D funding and encouraging the private sector to increase its own R&D effort and availing investment promotion incentives in research and training. Support to innovation will need to be broadened to include diffusion-oriented programmes. As innovation in Africa is relatively new, quick returns could be derived through local improvements to existing foreign technology and this could be escalated to the development of new technologies at a later stage. Governments will also need to stimulate development of regional innovation clusters by developing stronger sub regional community institution interactions.

For instance, in order for a country like Ghana to make appreciable progress in developing its high-tech export products industry and sector to boost trade in these products, there will be a need to not only develop its scientific and industrial research base, but to also take policy steps to dramatically increase the percentage of its scientists and engineers involved in R&D work.

A study, specifically conducted as part of the Ghana ICT4AD[38] process, on the number of research scientists and engineers in the universities and the number of registered practicing engineers in the country (table 7.1), estimated that the number of scientists and engineers (per million persons) was about 300. Of these, less than 10 per cent were involved in R&D work. This translated to less than 30 scientists and engineers (per million of persons) involved in R&D.[39] To achieve a sustainable development of the Information Society, national capability in ICT research and development should be enhanced.

[38] C.K Dzidonu, An Integrated ICT for Accelerated Development Policy and Plan Development Framework for Ghana, United Nations Economic Commission for Africa (UNECA), 2003.
[39] The ICTs, Trade and Economic Growth Study: The Ghana Report, 2007.

Table 7.1: Number of scientists and engineers

Scientists and Engineers (2000)			
	Registered Professional Engineers	**Scientists in the Research Institutes**	**Scientists and Engineers in the Universities and Colleges**
Total	3490	636	961
Per cent involve in R&D	< 5%	7% - 12%	5% - 7%

Source: An Integrated ICT for Accelerated Development Policy and Plan Development Framework for Ghana, United Nations Economic Commission for Africa (UNECA), 2003.

African governments will need to investment in this particular area. India has had a strategic vision to spur growth in the IT sector dating back many years. Special schemes have included: software technology parks, export processing zones, 100 per cent export oriented units, electronic hardware technology parks and a domestic tariff area.

Respondents to the ECA, 2006 survey identified ongoing activities to promote Innovation, Science and Technology and Research as (table 7.2):

- Establishment of incubation centres (Kenya, Ghana, Rwanda);
- Establishment of ICT Research and Technology Centres (Rwanda, Senegal);
- Development of technology parks (Ghana, Rwanda);
- Supporting collaborative research at the Universities (Ghana, Cameroon);
- Capacity-building for trainers and researchers using ICTs (Burkina Faso);
- Training (formal and non-formal) through electronic means - radio and educational television, online training (Burkina Faso); and
- Implementation of a virtual library accessible to all in order to increase the channels of access to training and knowledge (Burkina Faso).

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Table 7.2: Ongoing activities to promote Innovation, Science and Technology and Research

KE Strategy	Activity	Country
Innovation, S & T & Research	Establishment of technology parks, incubation centres, ICT Research & Technology Centres	Ghana, Kenya, Rwanda, Senegal,
	Collaborative research at the Universities	Cameroon, Ghana

	Increasing the capacity of trainers & researchers using ICTs	Burkina Faso
	Budget allocation to S&T research	Malawi
	Creation of technology institutes	Niger
Intellectual Property Rights	Intellectual property and ICT bills National Intellectual property agency/office/institution	Burkina Faso, Ghana, Niger, Rwanda Congo Brazzaville, Kenya, Senegal
Integration of ICTs in reforms in the financial sector	Electronic payments & transaction safeguards Initiatives being undertaken by banks	Congo Brazzaville, Ghana Mali, Niger, Senegal, Cameroon, Nigeria
	Integrated financial management system, computerization of customs	The Gambia, Guinea
Integration of ICTs into business processes, manufacturing, production, marketing, distribution	E-commerce bill, strategy and revising the legal texts for facilitating e-commerce Public Key Infrastructure Project	Mali, Niger, Burkina Faso Cameroon
	Development of an export – oriented software services and product development industry	Rwanda
	Greater visibility of IT applications in industry	Ghana
Integration of ICTs into agriculture and rural development	Market data real time access (fisheries, agriculture); community multimedia centres in rural areas	Senegal
	Application of ICT tools in extension services & for meteorological reports	Ghana
	Land-Use MIS & Management of Natural Resources	Rwanda

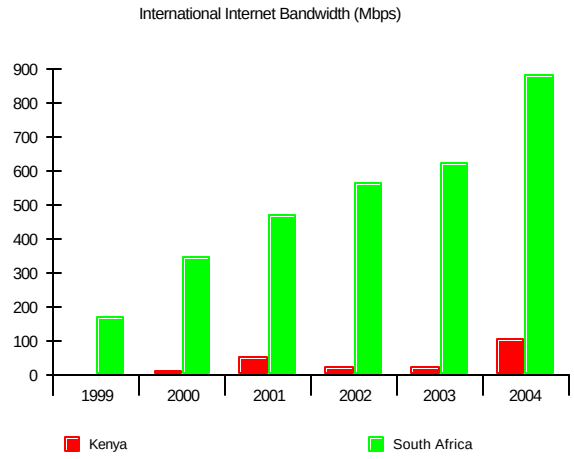
4. A dynamic information infrastructure that can facilitate the effective communication, dissemination, and processing of information

The knowledge-based economy places great importance on the diffusion and use of information and knowledge as well as its creation. The existing information infrastructure has evolved over many years and the emergence of a new mode of knowledge production is bringing with it new information access and dissemination needs. A dynamic information infrastructure should be accessible and easy to use enable users to tap into existing resources of creativity and knowledge. It will lead to the development of products and services that address more effectively many societal problems, including challenges in the areas of health care, education, and manufacturing.

Countries such as Uganda, Kenya, and the Gambia have embarked on infrastructure projects to facilitate high-speed connectivity for both voice and data exchange. Accessibility and reliability of such infrastructure is assuming an importance to the knowledge-based economy.

Another indicator of growth in information infrastructure is in the area of private computer networks and access to the Internet in terms of international Internet bandwidth. According to the "Trade and Economic growth in Kenya study" (2007), there was a large increase in the Internet bandwidth in 2004, although the total Internet bandwidth of just over 100mb/s was still very low when compared to South Africa with an international Internet bandwidth in of 900 Mb/s (figure 7.3). According to the Internet Market Analysis study 2006 (http://www.cck.go.ke), the current International bandwidth is 700 Mb/s, comparable to the South African figure for 2004. The growth of Mobile Internet is expected to increase the International bandwidth further in 2007.

Figure 7.3: Growth in international Internet bandwidth in Kenya and South Africa



Source: Trade and Economic growth in Kenya: The Strategic role of Information and Communications Technology (ICT), M. Wagacha, M. Kashorda, 2007.

Business Process Outsourcing (BPO) readiness

The BPO industry is regarded as one of the fastest growing industries in the world. It is predicted that the demand for outsourcing services will reach $180 billion in 2010.[40] The BPO boom in the Philippines is currently led by the demand for offshore call centres. The Philippines generated offshore service revenues of $2.1 billion in 2006, placing the country third behind India and China and slightly ahead of Malaysia. The Philippines BPO is forecasted to employ 900 000 people and earn $11 billion by the year 2010.[41] For African countries to effectively take a leaf from this book and tap into this lucrative sector, it becomes imperative that the necessary infrastructure to utilize BPOs is developed to facilitate competitiveness in trade both at the national and international levels.

[40] McKinsey 2005, *The Philippines' Offshoring Opportunity,* McKinsey & Company.
[41] Shameen, A 2006, *The Philippines' Awesome Outsourcing Opportunity.*

The growth in international traffic in Kenya is an indication of increasing economic activity and that of the growing utilization of ICT to facilitate international business. In the Budget Speech 2007/8, the Kenyan Minister of Finance, on the theme of further deepening efficiency and productivity through ICT development, noted that the BPO sector was one of the priority sectors in the Vision 2030 and that Government intended to make Kenya the preferred investment destination for ICT related activities that would create more wealth and employment opportunities. To achieve this goal, the Government would develop and support an efficient ICT infrastructure that provided easy access to international and national networks such as the planned East African Marine System (TEAMS) project scheduled for completion by mid-2008.

According to the Ghana "ICTs, Trade and Economic Growth Study", 2007, the country is ranked among the preferred countries for the BPO activities. According to the A.T. Kearney Index, Ghana was ranked 22nd out of 40 preferred BPO countries.[42] It is important that this recognition was utilised effectively to the country's advantage in the world trade. A number of companies have been established to participate in BPO activities with capacity having been developed from incubator laboratories and BPO training centres where a number of people were trained in various areas such as medical transcription, or as data entry clerks and call centre agents.

Under the e-Ghana Project, which aims to support programmes designed to implement the country's ICT-led development strategy, BPO training will be formalized and will be affiliated to formal training institutions. A SWOT Analysis for BPO Readiness in Ghana is shown in table 7.3 below. The SWOT analysis identified a number of strengths that Ghana had and which when well developed and exploited would enable the country to take advantage of the opportunities. The weaknesses identified are equally important and provide an indication of the areas that need prompt attention.

Table 7.3: SWOT analysis for BPO readiness in Ghana

STRENGTHS	WEAKNESSES
• Large pool of potentially good English speaking population • Competitive labour costs differential to US and UK companies • Stable geo-political environment in comparison to neighbouring as well as other countries worldwide • ITES-BPO sector identified as a focus areas for economic development by the Government	• Employability in the context of the Information Technology Enabled Services (ITES)-BPO industry, of large talent pool is proportionately low • Inadequate education infrastructure and training facilities • Low levels of IT literacy and PC proliferation at educational and business-commercial levels

[42] http://www.atkearney.com/shared_res/pdf/GSLI_Figures.pdf

• Availability and penetration of telecom and Internet services is rising • Several investor friendly policies including tax holidays, 100 per cent foreign owner-ship • Cyber laws to protect ITES-BPO investors in the process of being promulgated.	• Though costs of infrastructure may be lower in comparison to some countries, there is a current lack of suitable telecommunications and quality real estate infrastructure which is a bottleneck for investors • High inflation and interest rates, despite recent decreases • No policies or incentives specifically for the ITES-BPO sector • Low level of incumbent presence in spite of early off shoring activity (ACS).
OPPORTUNITIES	**THREATS**
• Leverage the image of its democratic and relatively stable political environment towards establishing itself as a regional hub for more established destinations • Establish itself as a subcontracting hub for more established destinations • Collaborate with countries such as South Africa and offer complementary services • Develop offerings such as medical transcription and data processing in the short and medium term.	• Proactive investment promotion of the ITES-BPO industry by competing Regional destinations such as Nigeria, Mauritius, Botswana • Lack of development of necessary educational and training infrastructure resulting in limited scalability for the industry.

Source: Ghana Government (2006) Improving Business Competitiveness and Increasing Economic Growth in Ghana: The Role of ICT-ITES.

Table 7.4: SWOT Analysis for ICT utilization in Trade in Egypt

Box 3: SWOT Analysis for ICT utilization in Trade in Egypt

Strengths	Weaknesses
• World Class ICT Infrastructure • Progressively growing ICT sector • Government commitment towards modernizing and developing ICT sector • Exporting is a national priority supported by new economic reform policies • Available ICT Caliber • Relevant regulatory environment (e-signature law)	• Inappropriate current volume and structure of exports • Lack of B2B portals that could facilitate international trading • Lack of e-trade specialists • Lack of awareness among exporters of e-trade concepts and advantages • Bad conduct of local exporters towards exporting opportunities emerging from business portals • Weak practices of current e-trading bodies especially International Trade Point which does not provide adequate information about its activities and it has a very limited market reach • Unclear statistics about the trade volume that takes place over the internet • Low share of finished commodities in total exports
Opportunities	**Threats**
• Growing economic activities and growing volume of exports • Various trade agreements that are not utilized • Increasing B2B portals in Egypt and the Middle East and the promising private initiatives in this regard • Initiatives to use ICT to improve other sectors competitiveness • Web Services will continue to gain popularity as corporations standardize with Internet technologies • The role of non-government organizations raising the awareness concerning Information technology field and Promoting ICT Education and Training • Increasing industrial activity	• Perception of IT value & delivery of commitments and quality • Burdensome exporting documentation • Competition from experienced exporters (i.e. China) • Incompetent transportation facilities and inadequate delivery channels for exported commodities • Lack of support programs for emerging B2B activities

Source: Study on ICT role in trade facilitation in Egypt, 2007.

Egypt has taken major strides towards building a modern and sophisticated ICT sector through the sound mix of regulatory and technological components (table 7.4). A conducive environment exists for ICT companies through a solid legal framework that ensures the coherence of ICT policies as well as providing a basis for competition and fair practices.

7.2 The role of ECA in promoting the Digital and Knowledge Economy

The ICT, Trade and Economic Growth (e-trade) Initiative

Governments' need to play a critical role in the creation of an enabling policy environment to enhance the penetration of ICT in business and trade as a key prerequisite for countries' transition into the digital and knowledge economy. The policy environment critical to successful use of e-business, could act either as an enabler and enhance adoption, or act as a barrier that stifles e-business practices.

In Africa, e-business will offer new opportunities to export-oriented companies, especially small, micro and medium-sized enterprises (SMMEs). Using networked ICTs, SMMEs could source production inputs more efficiently, eliminate intermediaries, shorten supply and export distribution chains and effectively reduce business transaction costs. The use of ICTs by SMMEs presents an opportunity towards the rapid deployment of ICT in economic sectors as a first step to the knowledge economy. However, while ICTs accord SMMEs the potential to compete globally, lack of infrastructure and unfavourable policy regimes hinder progress.

To address the role of ICTs in enhancing trade leading to economic growth, the ECA, under the auspices of the Global ePolicy Resource Network (ePol-NET), convened a Forum on ICTs, Trade and Economic Growth initiative in 2006. This Forum culminated with the launching of the ICTs, Trade and Economic Growth Initiative in the form of studies in six countries in Africa - Egypt, Ethiopia, Ghana, Kenya, Senegal and South Africa.

Objectives of the studies

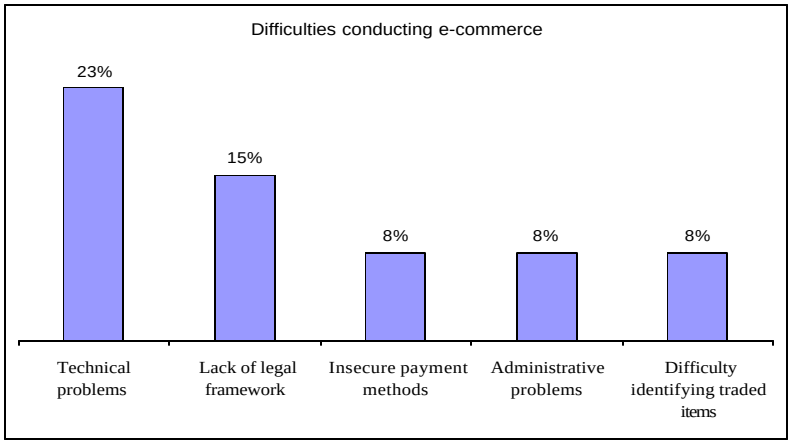
The overall goal of the studies was to assess the use of ICTs focusing the facilitation of domestic and international trade. Several sub-themes formed the scope of the study:

- Assessment of ICT and trade policy environment (including intra-African trade);
- Demonstration of potential economic benefits of ICT utilization in the enhancement of trade;
- Identification of gaps, if any, in the legal and regulatory frameworks and policy recommendations to governments; and
- Assessment of the awareness and usage of ICTs in trade by exporting by SMMEs.

Use of ICTs by SMMEs

In Egypt, the study emphasized on the gap between the ICT sector and international trade practices and proposed a need to link e-commerce applications with the various business practices in the country in a way that enabled Egyptian business to effectively engage in electronic trading. Egyptian SMMEs were utilizing ICT in business, but not as much in trade as only 10 per cent of the companies that accessed the Internet from business premises were involved in e-commerce transactions.

Figure 7.4: Difficulties conducting e-commerce



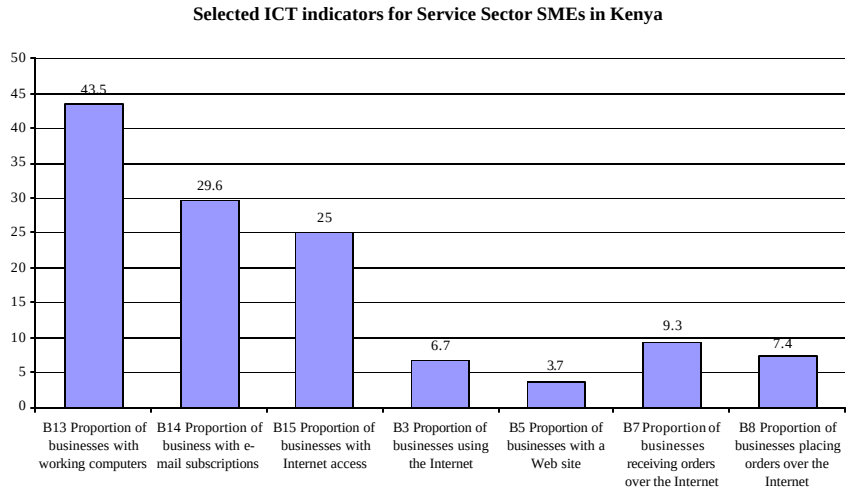
Source: Study on ICT role in trade facilitation in Egypt, 2007.

From figure 7.4, the difficulties in conducting e-commerce calls for solutions which include:

- The need for educating the SMME community about e-commerce applications and the resultant benefits for their businesses;
- Maintaining quality and cost effective ICT infrastructure and continuously developing infrastructure to realize enhanced and low cost services; and
- A dynamic legal and regulatory environment that enhances trust and effective online disputes resolution mechanisms thereby encouraging the companies to conduct electronic business nationally and internationally.

According to the study, "Trade and Economic Growth in Kenya: The Strategic Role of Information and Communications Technology (ICT)" (2007), most of the companies listed on the Nairobi Stock Exchange (NSE) (http://www.nse.co.ke) had created fully networked organizations and had automated their mission-critical business applications. Small enterprises however, were not using ICT as much as the large companies, although this was expected to be an area of growth in the future. Small enterprises required relatively cheap software solutions and were also more sensitive to the cost of ICT and Internet services.

Figure 7.5: Selected ICT indicators for service sector SMEs in Kenya *(Partnership on Measuring ICT for Development indicators)*

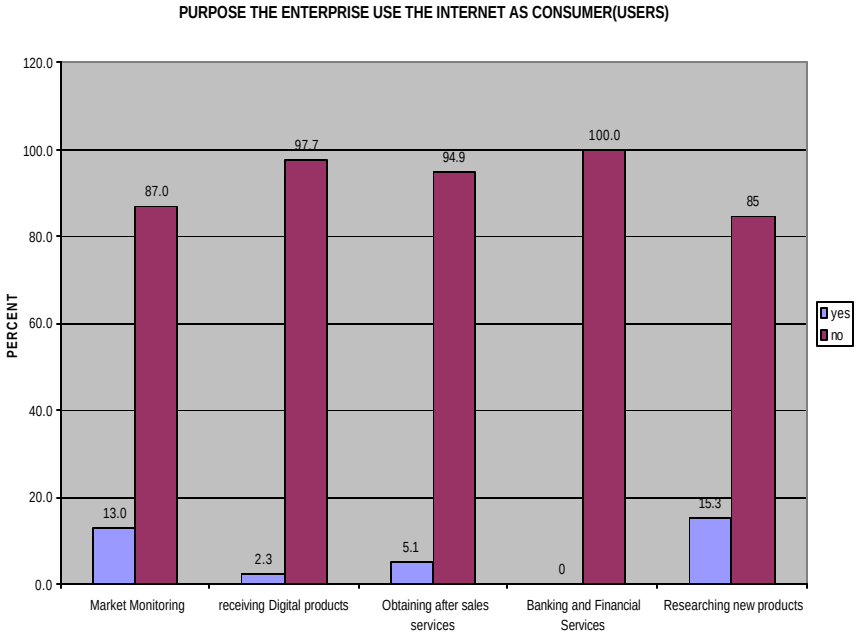


Source: Trade and Economic growth in Kenya: The Strategic role of Information and Communications Technology (ICT), M. Wagacha, M. Kashorda, 2007.

From a sample size of 216 SME's in cities and major towns of Kenya, 43.5 per cent of the service sector businesses sampled had working computers and 25 per cent of the businesses had access to Internet. However, only 6.7 per cent were using the Internet and only 3.7 per cent had a web presence (figure 7.5).

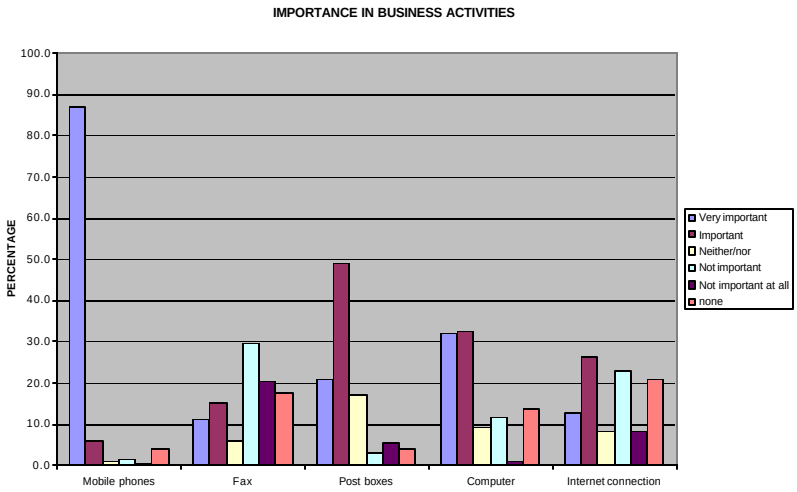
The main purpose for using the Internet was to monitor the market and researching for new products as shown in figure 7.6. Although 9.3 per cent of the enterprises reported that they had received orders via the Internet (i.e., via e-mail or the web), none utilized the Internet for banking or financial services.

Figure 7.6: Purpose of using the Internet in SMEs



Source: Trade and Economic growth in Kenya: The Strategic role of Information and Communications Technology (ICT), M. Wagacha, M. Kashorda, 2007.

Figure 7.7: Relative importance of mobiles, computers and Internet in SMEs



Source: Trade and Economic growth in Kenya: The Strategic role of Information and Communications Technology (ICT), M. Wagacha, M. Kashorda, 2007.

Figure 7.7 illustrates the importance of the mobile phones to SMEs compared to other forms of communications, probably due to the much higher mobile phone penetration levels.

The study concluded "*there was limited readiness and use of ICT by SMEs in Kenya because of lack of awareness of potential benefits of ICT and lack of local ICT applications appropriate for the sector. ICT policy must aim to promote new ICT facilitated business practices.*"

For Ethiopia, according to the sampled firms, the absence of an online payment system and an appropriate legal framework for electronic commerce were the main obstacles to the expansion of the use of ICTs in trade (table 7.5). Lack of client firms and customers who were ready to use the Internet to exchange goods and services as well as the non-conformity of the products and services were cited as additional barriers to expand e-commerce.[43]
To identify the main obstacles on the use of ICTs in trade, the sampled SMMEs were requested to indicate the main constraints related to Internet sales and purchases. The responses are as shown in table 7.5.

[43] Study on The Role of ICTs in enhancing Trade and Economic Growth in Ethiopia, 2007.

Table 7.5: Main Barriers to E-Commerce in Ethiopia

Barrier	Number of rims	Percent of firms	Rank
Products/services not suitable for sales via the Internet	14	35.0	**23**
Customers not ready to use Internet purchases	16	40.0	**33(3)**
Absence of an online payment system	23	57.5	**40(1)**
Absence of legal framework for electronic commerce	21	52.5	**35(2)**
Logistic problems with the delivery network	12	30.0	**8**
Lack of ICT skills	11	27.5	**11**
Others	2	5.0	

Source: Survey data.

Sampled firms were also requested to suggest and identify possible solutions to mitigate the problems facing e-commerce in the country. The firms identified several areas of intervention to enhance the use of ICTs in trade. The responses are as shown in table 7.6.

Table 7.6: Measures to Expand E-Trade in Ethiopia

Measure	Number of rims	Percent of firms	Rank
Improve telecom, mobile and Internet Services	39	97.5	**71 (1)**
Lower telecom, mobile and internet charge	36	90.0	**22 (2)**
Improve management process within the firms	33	82.5	**3**
Improve customs and trade regulations	31	77.5	**9**
Introduce new licensing and registrations system	22	55.0	**15 (3)**
New regulations for e-contracts and conclusion of transactions	22	55.0	
Improve access to financial resources for ICT related investments	37	92.5	
Introduce cross border e-payment system	34	85.0	**15 (3)**
Encourage private sector participation in the internet business	36	90.0	**14**

Source: survey data.

From table 7.6, improving the telecommunications services was the most important area of intervention proposed coupled with the reduction of service charges. The introduction of new business licensing procedures and an e-payment system were also additional solutions proposed by surveyed firms. Encouraging the participation of the private sector in ICT infrastructure development as well as the improvement of customs and trade regulations were also cited as important measures to improve and expand e-trade in Ethiopia.

In Ghana, SMEs expressed their willingness to build their ICT skills and it was the expectation of SMEs to receive ICT training and capacity building from their business associations and public institutions. From the survey conducted for the ICTs, Trade and Economic Growth Study only 12 per cent of the SMEs acknowledged having received ICT training from their respective affiliations. To address the problem of low e-competency and capacity building for export oriented SMEs, the Ghana Export Promotion Council had

developed an e-competency strategy, which, if well implemented would build the capacity of SMEs to take advantage of ICTs to improve every aspect of their business.

The survey sought to identify ICT facilities available to SMEs, how predominantly they were being used and the importance attached to each facility. Fixed telephones were the only facility available to all SMEs and most widely used for external trading activities. The limited fixed telephone network had fuelled the rapid growth of mobile communication networks. Although the use of computers had become an integral part of the operations of the SMEs, there had been no concerted effort on the part of most SMEs to acquire e–competency or to use the Internet as a tool to increase, or at least, maintain international competitiveness. However, approximately 98 per cent of the respondents noticed improvements after they introduced ICTs in their operations. Evidence of such improvements was in the area of speed, efficiency, accuracy and reliability in business operations.

From the SME perspective, ICT facilities should be accessible and easy to operate. Convenience in using ICTs was necessary as it formed an essential part of their operations. Since SMEs sought to minimize costs, 100 per cent of respondents wanted ICT facilities to be affordable and the cost of recurrent expenditure to be transparent.

Among the concerns, was the issue of security and privacy in using ICTs. This also included issues such as copyright and intellectual property rights.

Conclusion

The creation of a knowledge economy and knowledge based industries does not happen in isolation but is highly correlated with the existence of the human capital, a conducive operating environment, a legal and regulatory regime, access to financial resources, a clear rule of law that respects individual and commercial rights, Intellectual Property protection to encourage innovation and creativity.

Policies that create a favourable climate for stability, predictability and fair competition at all levels should be developed and implemented in a manner that not only attracts more private investment for ICT infrastructure development, but also enables universal service obligations to be met. The ability for all to access and contribute information, ideas and knowledge is essential in an inclusive Information Society.

Creation and diffusion of knowledge as a result of the innovative activity is a key issue. Knowledge is important in encouraging innovation and creativity. R&D is generally hampered by the lack of research capabilities and qualified specialists, inadequacy of the mechanisms available for appropriating the returns from these investments or lack of available financing. It is important for governments to focus on policy options that create an appropriate economic incentive and institutional regime that encourages innovation in all sectors of the economy and eliminates barriers to entrepreneurship. Issues such as, R&D incentives and direct government funding for R&D activities should be addressed. Partnerships in research and development, technology transfer, manufacturing and utilization

of ICT products and services are crucial for promoting capacity-building and global participation in the Information Society.

An educated and skilled human resource or human capital is the most valuable asset and it should be recognized that the cooperation between academic institutions and the ICT industry must be strengthened if the market realities are to be reflected in educational programme. Awareness and literacy in ICTs are also an essential foundation in this regard.

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Appendix A: Rwanda's Performance in Addressing the Critical Success Factors and Conditions (CSFCs) for Facilitating the Development of its Information Economy and Society

The Process Level Critical Success Factors and Conditions	
Critical Success Factors and Conditions (CSFCs)	**Comments**
Active high profile national ICT champion --- the President	There is full commitment to championing the Rwanda ICT4D process at the highest level of Government. H.E. President Paul Kagame has personally been championing the process and he is known world-wide as a leader committed to the development, deployment and the utilization of ICTs to facilitate the developmental process of Rwanda. His singular role in starting and championing the Rwanda ICT4D process has been instrumental in the development and the implementation of the policy and the NICI-2005 Plan
Top level political and economic leadership, support, commitment and championship of the process	The political leadership (the executive and legislature) of Rwanda is committed to the ICT4D process. So does key members of the economic leadership of the country. The President and a number of the top political and economic leadership are also in addition championing the process
A clear national ICT4D vision, missions and strategies to guide the formulation and development of the process outputs – the policy and the details of the corresponding plans	The Rwandan ICT4D process is guided by a clearly stated Vision (the Vision for Rwanda) and Missions statements. These were used to provide the basis for the development of the strategies for the realization of the missions. The Vision and Mission Statements and the corresponding broad strategies provided the basis for the development of the Policy and corresponding of the NICI-2005 Plan
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	The ICT-led Development Vision and Missions are in line with the overall socio-economic development vision for Rwanda endorsed by the Government. The Government of Rwanda is fully committed to an ICT-driven socio-economic development programme within the framework of its Vision 2020 aimed at achieving for Rwanda a middle income status by 2020 and transform its society and economy into an information-rich knowledge-based society and economy by modernizing its key sectors using information and communication technologies. There is therefore a total endorsement and commitment to the ICT4D process by the Government

The goodwill and support of the people and their endorsement of the need for the Vision and stated missions and their realization	The Rwanda ICT4D policy and plan development and implementation process was a consultative one involving nation-wide stakeholder consultation within the public and private sector, including civil society. There is wide ranging public and stakeholder support for the process and the public has made significant inputs and contributions into the policy formulation process. The ICT4D Vision and missions articulated was based on public inputs, submissions and extensive consultations. On the whole the goodwill and support of the people for the process has been demonstrated throughout the extensive nation-wide multi-stakeholder consultative process
Strategic Government Ministry to facilitate and coordinate the policy and plan development process on behalf of the Gove rnment	The Ministry of Infrastructure (and its predecessor Ministry of Public Works, Transport and Communications) served as the strategic Ministry for facilitating and coordinating the development and the implementation of the policy and the plan. RITA which was set-up as part of the process is serving as the national body for coordinating the implementation of the NICI-2005 Plan and other subsequent plans
Strategic Government Ministry to facilitate and coordinate the policy and plan development process on behalf of the Government	The Ministry of Infrastructure (and its predecessor Ministry of Public Works, Transport and Communications) served as the strategic Ministry for facilitating and coordinating the development and the implementation of the policy and the plan. RITA which was set-up as part of the process is serving as the national body for coordinating the implementation of the NICI-2005 Plan and other subsequent plans

Dedicated policy and decision makers, and professionals, cutting across the public and private sector committed to the process	There is in Rwanda a critical mass of dedicated policy decision makers and professionals across the public and private sector that are committed to the Rwandan ICT4D process since its inception. The deployment and use of ICTs to facilitate Rwanda's development process has been central to nation's development planning and activities since 1999 and key decision makers within the public and private sector are committed to this process
Adoption of a well-scheduled step-by-step approach with specific milestones and deliverables during the policy and plan development process	The Rwanda ICT4D process was aimed at three broad types of deliverables: *framework document*, *policy document* and the corresponding *plans (with the NICI-2005 Plan being the first of such plans)* The development of all these deliverables were carried out within the context of a well-scheduled step-by-step approach with specific milestones
The identification and the setting of realistic objectives and targets that can be achieved within a given time-frame	The programmes and initiatives documented in the NICI-2005 Plan were realistic --- with each associated with specific time bound measurable targets to be achieved by an identified implementation agency. The programmes and the initiatives of subsequent NICI plans will also be realistic and aimed at achievable targets
A well-researched policy formulation and plan development process that made an effort to learn from experiences of other countries	The development of the Rwandan ICT4D policy and the NICI-2005 Plan were based on an extensive research work and data gathering exercise as well as on lessons learnt from the experiences of other countries within and outside Africa. Extensive baseline data and information on key aspects of the policy and the plan has been gathered from both primary and secondary sources; individual and stakeholder inputs covering ranges of relevant topics has been solicited and documented; an extensive socio-economic study and analysis has been carried out; details of the landscape of the Rwanda ICT sector as well as the a study of the deployment and use of the ICTs in all the key sectors of the economy has been carried out among others
Nation-wide stakeholder consultation within the public and private sector to facilitate across the board contribution to the process and its deliverables	The Rwanda ICT4D policy and plan development process was based on an extensive bottom-up nation-wide consultative process involving key stakeholders in all sectors. This national consultative exercise involved: face-to-face meetings, dialogs and public forums across the country. Key stakeholders involved in the process include: Cabinet Ministers, senior civil servants, parliamentarians, traditional rulers, public sector organizations, private sector organizations, various constituencies within the ICT industry and sector, universities and colleges, women's groups, labour unions, political parties, civil society groups, among others

Rounds of dialog sessions with key stakeholders -- Government, Private Sector & Civil Society	The Rwanda ICT4D process since its inception has involved series of one-on-one dialogs with key stakeholders in government, public sector, private sector and civil society
Logistic support and facilitation for the process and	Logistics support for the policy and plan development process been provided by the Ministry of Infrastructure (and its predecessor Ministry of Public Works, Transport and Communications) and RITA under a Technical Assistant programme extended to the Government of Rwanda by the ECA under the AISI initiative
Continuous push from the top for action and results	The Rwandan ICT4D process has benefited from a high level support. Also the process owes some of its success to public support and involvement that resulted from the bottom-up consultative approach adopted throughout the process

The Implementation Stage Critical Success Factors and Conditions (I-CSFCs)	
Enabling Environment Critical Success Factors and Conditions	
Governance and Socio- Political Enabling Environment CSFCs	**Comments**
Good Governance and Rule of Law	Good governance and the rule of law situation in Rwanda are good. This has contributed to providing a stable political environment and climate for the implementation of the ICT4D policy and the NICI-2005 Plan
Functioning Democracy and Democratic Institutions	Rwanda's democratic system and institutions are young and improving. The ICT4D process has benefited from the country's existing and conducive democratic process
Prevailing peace, national unity and national security	Rwanda has since the 1994 genocide has been a relatively peaceful nation with no major political upheavals that threatened the peace and security of the country. Peace, national unity and security now prevail in the country and this has facilitated the nation's ICT4D process tremendously
Sustainable un-interrupted political stability	Rwanda after the 1994 war and genocide has been enjoying an un-interrupted political stability for a number of years. This prevailing political stability has no doubt contributed to the implementation of the NICI-2005 Plan. There are signs that the prevailing political stability of the country is a sustainable one
Subregional stability and calm	Subregional instability has been a problem area for a number of years. This on-going sub regional instability does have the potential to negatively impact on Rwanda's socio-economic development efforts including the ICT4D process. Efforts to resolve the underlying issues and problems of the sub regional instability are bearing some results
Stable economic policy environment	Rwanda's economic policy environment has for a number of years been a stable one which to some extent is influenced by global factors and requirements set up by its major development partners including the World Bank and the IMF. The prevailing stable economic policy environment has to some extent positively impacted on the Rwandan ICT4D process in general and on the implementation of the NICI-2005 Plan in particular

Socio-Economic Development Framework Enabling Environment CSFCs	Comments
Sound Socio-Economic Development Policy and Priorities Setting Framework	The development and implementation of the Rwanda's ICT4D policy and the NICI-2005 plan has been set within the wider socio-economic development policy frameworks of the country. These frameworks set out the broader social and economic development objectives and priorities for the country
Stable (non-erratic) macroeconomic Policy Environment	The general global trend is towards economic liberation and Rwanda has been implementing various policy initiatives aimed at the liberalization of its economy. Some of these policy initiatives had positive impact on the economy while others were not so successful
Stable Economic Investment Climate	Rwanda has made progress towards ensuring a stable investment promotion and facilitation climate necessary to attract the substantial FDI that will be required for implementing the ICT4D initiatives and programmes by the private sector, and in some cases by the public sector. Rwanda has been doing reasonably well in attracting FDI, but more will need to be done to attract substantial investments in the area of ICTs
Legal, Regulatory and Institutional Environment CSFCs	**Comments**
Relevant Legal and Legislative Provisions to support the ICT4D policy and plan implementation process	Rwanda has implemented some of the legal, and the legislative provisions required for supporting the ICT4D policy implementation process. However, a number of these legal regulatory and legislative provisions identified in the NICI-2005 Plan are still outstanding. For example, parliament will need to pass specific legislative instruments for setting up the relevant institutional structures and arrangements that will be necessary for supporting and facilitating the implementation of the plan. Some specific cyber laws in areas like intellectual property laws, data protection laws are yet to be enacted to provide the necessary legal and legislative provisions for supporting the development, deployment and use of ICTs within the economy and society
Enabling Regulatory Environment necessary for implementing specific relevant components of the ICT4D policies and plans	To some extent, a conducive investment friendly, stable and industry responsive regulatory framework and environment critical for the development of the ICT sector and industry do exist in the country. Rwanda has made some advances in putting in place the necessary regulatory framework and agencies --- but there is the need to occasionally examine the provisions of the framework and bring them in line with the rapid changes in the ICT industry and sector

Institutional Structures and Arrangements to facilitate and support the policy and plan implementation process	The setting up of RITA to coordinate the ICT4D process in Rwanda has provided an essential component of the requisite institutional structures and arrangements to facilitate and support the policy and plan implementation process. However, the proposed National Information Technology Commission (NITC) is yet to be set-up. Also apart from the need to strengthen RITA, the instructional structures proposed for the Government Ministries and the PSOs to support the implementation of the NICI-2005 Plan and subsequent plans are yet to be fully set-up and strengthened

National Support, Leadership and Championship Requirements	
Top-level political leadership commitment and championship for the ICT4D policy and plan implementation process	There is evidence of top leadership commitment to the Rwanda ICT4D process. Championship of the process by the top leadership will need to be articulated. On the whole there is a demonstrated commitment to the process
A core group of dedicated senior level decision makers and professional within the public and private sector committed to providing leadership and championship to facilitate and support the ICT4D policy and plan implementation process within their respective organizations, institutions and business establishments and entities	Rwanda, to some extent do have a core group of senior and middle level decision makers and professionals that could articulate the ICT4D vision nationally and provide the needed leadership and championship within their organizations and institutions to transform this vision into actions that could move the nation forward. However, the size of this group falls short of the critical mass that is required to move the process forward
Across-the-board stakeholder commitment to the practical realization of the aspirations, the goals and targets of the ICT4D Vision and corresponding missions and strategies	A key aspect of the national consultative exercise of Rwanda ICT4D process involved identifying and getting a consensus among the key stakeholders on the nation's ICT4D vision, missions and strategies. There is therefore an across-the-board stakeholder commitment to the process in terms of the need for the realization of the aspirations for the nation's ICT4D vision
	Comments
Changes in relevant organizational and institutional structures, processes and procedures conducive for the effective deployment and use of ICTs	For the deployment and use of ICTs to make appreciable impact on organizational activities and operations, the processes, and procedures of these organizations in both public and private sector will need to be looked at, to make them conducive for the effective deployment and use of ICTs. The institutional reform of the public sector

Changes in unproductive attitudes to work, duty and service that could hinder the effective deployment and use of ICTs to improve organizational activities, operations and service/product delivery	in Rwanda is ongoing. This process is being set within the wider context of carrying out the requisite organizational reforms to support the implementation of e-government in Rwanda Poor and unproductive attitude to work and work ethics are still a major problem in a number of organizations in both the public and private sector. Attitudinal change will be required across the board if the deployment and use of ICTs within the organizational set-ups of both the public and private sector is to have an appreciable impact on improving organizational efficiency, effectiveness and productivity
Motivated, disciplined and adequately remunerated workforce committed to work and bring about the necessary organizational changes conducive for the effective deployment and use of ICTs within their organizations and institutions	Although, some efforts have been made in the last couple of years to improve the remuneration package of workers and as well as improve their conditions of work, advancement and promotional prospects in most organizations and establishments in both the public and private sector, this has not substantially contributed to addressing the problems associated with lack of motivation and initiatives of workers. Additional efforts will need to be directed at turning the Rwanda workforce into a motivated, disciplined and adequately remunerated workforce committed to work and bring about the necessary organizational changes conducive for the effective deployment and use of ICTs within their organizations and institutions

Facilitating Environment Critical Success Factors and Conditions	Comments
Well educated and informed society	A critical pre-condition for the development of Rwanda's information and knowledge-based economy and society is a well educated and informed society. Rwanda will need to take steps to reverse its high illiteracy rate and providing the conditions to facilitate the development of a well informed society will be critical for the success of the Rwanda ICT4D process
Modernized and efficient civil and public service	The Rwandan public service is being reformed and modernized, however the impact of this modernization in terms of improving the efficiency and the productivity of the service is yet to be realized. A modernized and efficient civil and public service will play a crucial role in facilitating the implementation of key components of the ICT4D policy and plans
Financial and technological resource availability	The implementation of some of the key components of the Rwandan ICT4D policy and the corresponding plans will require substantial financial and technological resources. Although some progress has been made in mobilizing the necessary financial and other technological resources to support the implementation of the programmes and the initiatives of the NICI-2005 Plan, more will need to be done to created the necessary enabling environment to attract resources through FDI and domestic investment
Human resource availability in key skill areas	The human resource situation in Rwanda has improved during the implementation of the NICI-2005 Plan. However, Rwanda lacks personnel in critical skill areas necessary for supporting the development of the nation's information society and economy
Disciplined, motivated and patriotic citizens led by inspired, dedicated committed and incorrupt political, economic and social leadership	Rwandans, by and large, are patriotic and hardworking people. Motivation can in some cases be a problem at work places. Also petty bribing and corruption at work place, sometimes lead to poor service delivery or withholding of service. The greater percentage of the nation's political, and economic leadership are dedicated and committed to the process of the transformation of the country

Appendix B: Main Pillars of the NICI Policies in Selected Member States

	Benin	Burkina Faso	Burundi	Cameroon	Cape Verde	Chad	Comoros	Côte d'Ivoire	D R Congo	Gambia	Ghana	Guinea	Malawi	Mali	Niger	Nigeria	Rwanda	Sierra Leone	Swaziland
Agriculture			✓	✓				✓			✓		✓			✓			
Content Development						✓	✓								✓				
Deployment and Spread of ICTs in the Community						✓					✓		✓				✓		
Developing a Globally Competitive Value-Added Services Sector											✓		✓			✓			
Developing an Export-Oriented ICT Products and Services Industry											✓		✓						
E-applications	✓						✓							✓					
Ecommerce				✓															
Economic Development and Growth of the ICT Sector																	✓		✓
Education		✓	✓	✓	✓			✓		✓	✓	✓	✓				✓		✓
Environment Protection																✓			
Facilitating Government Administration and Service Delivery			✓	✓		✓	✓		✓		✓		✓	✓	✓		✓		
Facilitating National Security and Law and Order					✓						✓					✓	✓	✓	
Fight Against Poverty						✓									✓			✓	
Financial Services Sector																			✓
Gender				✓															
Health			✓	✓	✓			✓		✓	✓					✓			
Human Resource Development	✓			✓		✓	✓				✓		✓	✓	✓		✓	✓	✓
ICT Services				✓															
Infrastructure and Security				✓															
Legal, Regulatory, and Institutional Framework Provisions	✓		✓			✓	✓				✓		✓	✓	✓	✓	✓		✓
Media																			✓
Physical Infrastructure Development	✓	✓			✓	✓			✓	✓	✓	✓	✓	✓	✓	✓			✓
Private Sector Development							✓	✓		✓	✓	✓	✓			✓	✓		
Promoting Diaspora Intervention														✓					
Promoting Local and Foreign Direct Investment in ICTs											✓		✓				✓		
R & D, Scientific and Industrial Research Capacity Development											✓					✓			
Strategic ICT Leadership																			✓
Tourism, Environment and Natural Resources				✓															✓
Trade and Industry			✓																
Youth				✓															