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# Rwanda Knowledge Society Policy Handbook

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# TABLE OF CONTENTS

Table of Contents .....	ii
List of figures .....	iii
LIST OF ABBREVIATIONS .....	iv
INTRODUCTION: .....	1
1. KNOWLEDGE SOCIETIES .....	3
1.1. What are knowledge societies? .....	3
1.2. Basic concepts .....	4
2. POLICIES FOR KNOWLEDGE SOCIETIES .....	12
2.1. What is a knowledge society policy? .....	12
2.2. National, Regional and Local Context .....	13
The role of education and training in knowledge societies .....	16
3. BUILDING KNOWLEDGE SOCIETY POLICIES .....	19
3.1. Explicit public policies functionalities .....	19
3.2. Areas of governmental intervention .....	22
3.3. Phases of a knowledge society policy .....	25
4. ADAPTATION OF A KNOWLEDGE SOCIETY POLICY TO NATIONAL, REGIONAL, OR LOCAL CONTEXTS .....	30
5. WHAT IS NEEDED TO BUILD KNOWLEDGE SOCIETIES IN AFRICA .....	32
6. RWANDA AS A KNOWLEDGE SOCIETY .....	36
7. KNOWLEDGE SOCIETY POLICIES IN RWANDA .....	39
7.1. The National Information and Communication Infrastructure Programme (NICI) .....	39
7.2. E-Readiness .....	40
8. CONTEXTUALISATION AND USE OF THE UNESCO KNOWLEDGE SOCIETIES HANDBOOK AT THE COUNTRY LEVEL/RWANDA .....	47
9. RWANDA BY 2040 .....	50

# LIST OF FIGURES

<b>Figure 1:</b> Relationships between data, information and knowledge .....	4
<b>Figure 2:</b> Data, information, knowledge, technology and innovation .....	6
<b>Figure 3:</b> Internet users in Africa .....	7
<b>Figure 4:</b> Internet penetration in Africa .....	7
<b>Figure 5:</b> Consecutive steps for the construction of a KSP .....	22
<b>Figure 6:</b> First steps for building a KSP .....	26
<b>Figure 7:</b> Building a KS. The process .....	28
<b>Figure 8:</b> Rwanda’s National Backbone Project .....	37

# LIST OF ABBREVIATIONS

**COMESA:** Common Market for Eastern and Southern Africa

**EGOV:** Electronic Governance

**EU:** European Union

**EC:** European Commission

**ECA:** Economic Commission for Africa

**ECE:** Economic Commission for Europe

**ECLAC:** Economic Commission for Latin America and the Caribbean

**ECOSOC:** Economic and Social Council

**FDI:** Foreign Direct Investment

**HERD:** Higher education expenditure on R&D

**ICT:** Information and Communication Technology

**IFAP:** Information for All Programme

**IMF:** International Monetary Fund

**IT:** Information Technology

**InfoComm:** Information and Communication

**KS:** Knowledge Societies

**KSP:** Knowledge Society Policy

**KSP:** Knowledge Society Public Policy

**KSP-BoR:** KSP Board of Representatives

**KSP-DAT:** KSP Design and Analysis Team

**KSP-MCU:** KSP Management and Coordination Unit

**KSP-SB:** KSP Steering Board

**MOOC:** Massive Open Online Courses

**NICI:** National Information and Communication Infrastructure

**NGO:** Non-Governmental Organization

**NPHRST:** National Profiles Human Resources in Science and Technology

**OECD:** Organisation for Economic Co-operation and Development

**PPP:** Public-Private Partnerships

**PPPP:** Public-Private-People Partnerships

**R&D:** Research and Development

**SD:** Sustainable Development

**SME:** Small and Medium-sized Enterprises

**UNESCO:** United Nations Educational, Scientific and Cultural Organization

**UNU:** United Nations University

**UNU-EGOV:** UNU Operating Unit on Policy-Driven Electronic Governance

**UNDPEPA:** United Nations Division for Public Economics and Public Administration

**UNCTAD:** United Nations Conference on Trade and Development

**UNDP:** United Nations Development Programme

**UNESCAP:** United Nations Economic and Social Commission for Asia and the Pacific

**WIPO:** World Intellectual Property Organization

**WGIG:** Working Group on Internet Governance

**WICANN:** World Internet Corporation for Assigned Names and Numbers

**WTO:** World Trade Organisation

**WSIS:** World Summit on the Information Society

# INTRODUCTION:

Have you ever wondered how a knowledge society public policy (KSPP) is built? Are you responsible for generating or implementing a KSPP for your country, region, or city? Do you have to monitor and evaluate an existing KSPP? Are you a civil servant concerned with the development of knowledge societies? Are you a citizen worried about how knowledge societies will contribute to your country's development? Then this handbook is for you.

This handbook is grounded on existing knowledge and practices to provide policy-makers, civil servants and educators with an actionable conceptual framework for understanding and assessing the relationships between the United Nations 2030 Agenda for Sustainable Development<sup>1</sup> and its Sustainable Development Goals (SDGs), and knowledge societies. By identifying gaps as well as strengths, the handbook hopes to enable Rwanda to more effectively deploy resources and implement appropriate policy measures to build its knowledge society.

The handbook has been developed to support the training sessions on knowledge societies and policy for an executive training course in Rwanda on 18 and 19 May 2017 but, appropriately adapted, it can be used for further training sessions in Rwanda or in other African countries. For reference and reflecting purposes it is mostly based on three previous related works: "Public Policies for Information Society: A Handbook" (IFAP – UNESCO, 2009<sup>2</sup>); "Knowledge Societies Policy Handbook" (IFAP – UNESCO and UNU EGov, 2016<sup>3</sup>); and "Africa as a Knowledge Society: A Policy Handbook" (IFAP – UNESCO, 2013<sup>4</sup>). It also reflects on Rwandan policy documents but takes into consideration the African continent in general. Most of the content has been specifically researched for the training session.

The handbook has been enriched by students' comments during the executive training course in Rwanda on 18-19 May 2017, collected by Dr Rehema Baguma, the Workshop Facilitator, as well as Dr Baguma's contribution on practical exercises.

However, since the African and Rwandan landscape regarding KS is changing so fast, please consider that the content of this handbook may become rapidly outdated.

The objectives of the training sessions are:

1. to introduce the concept of knowledge societies (KS) and discuss the importance of generating, implementing, assessing and updating knowledge society policies (KSP);
2. to introduce the role of governments and educators in supporting the development of a knowledge society;

<sup>1</sup> See Sustainable Development Goals, at <http://www.un.org/sustainabledevelopment/development-agenda/>

<sup>2</sup> "Knowledge Societies Policy Handbook", IFAP UNESCO / United Nations University, Paris, 2016. Director: Tomasz Janowski, UNU. Rehema Baguma, João Alvaro Carvalho, Guillermina Cledou, Elsa Estevez, Susana Finkelievich, Tomasz Janowski, Nuno Vasco LOPES, Jeremy Millard. Available at: [http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge\\_societies\\_policy\\_handbook.pdf](http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge_societies_policy_handbook.pdf)

<sup>3</sup> "Public Policies for Information Society. A Template", Susana Finkelievich, Adrián Rozengardt, Alejandra Davidziuk and Daniel Finkelievich, UNESCO, Communication and Information Sector, Information For All Programme (IFAP), Paris, 2010, available at: [http://portal.unesco.org/ci/en/files/29360/12602731983IFAP\\_Template\\_en.pdf/IFAP\\_Template\\_en.pdf](http://portal.unesco.org/ci/en/files/29360/12602731983IFAP_Template_en.pdf/IFAP_Template_en.pdf).

<sup>4</sup> Roxana Bassi and Susana Finkelievich, "Africa as a Knowledge Society. A Policy Handbook", IFAP – UNESCO, Kampala, 2013. <http://www.roxanabassi.com.ar/files/IFAP-Uganda-as-a-Knowledge-Society-training-manual.pdf>

3. to analyse e-readiness indicators in order to understand the state of the art concerning KS in the world, Africa and Rwanda in particular;
4. to reflect on the knowledge acquired through a series of practical exercises based on the current African and Rwandan situation; and
5. to draft a national roadmap for the contextualization and use of the UNESCO knowledge society handbook at the country level.

### **Expected Learning Outcomes:**

By the end of the workshop, participants should:

1. have an understanding of what the term knowledge societies means and the importance of knowledge societies for national and global development;
2. have an appreciation of the need to generate, implement, monitor, evaluate, and update knowledge society policies (KSP) in general and in Rwanda in particular;
3. understand the role governments and educators in general and in Rwanda in particular should play in supporting the development of a knowledge society (KS);
4. have an awareness of the e-readiness concept and indicators for the KS and their status in the world, Africa and Rwanda in particular;
5. reflect on the policy strategies required to make Rwanda a knowledge society;
6. have an understanding of how to use the UNESCO Knowledge Society Handbook for Rwanda.

Since this is a handbook, the language has been kept understandable for people with diverse educational backgrounds, and the quoted literature is listed as footnotes to facilitate reading. However, a list of additional reading materials is available at the end of the handbook.

This handbook provides examples of knowledge societies policies in several countries. If you are interested in more examples, please consult the Knowledge Societies Policy Library, IFAP UNESCO – UNU EGOV, 2016, available free of charge at:

[http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge\\_socities\\_policy\\_library.pdf](http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge_socities_policy_library.pdf)

Susana Finkelievich, June 2017

# 1. KNOWLEDGE SOCIETIES

## 1.1. What are knowledge societies?

According to UNESCO, knowledge societies (KS) are societies in which people have the capabilities not just to acquire information but also to transform it into knowledge and understanding, which empowers them to enhance their livelihoods and contribute to the social and economic development of their communities. (IFAP UNESCO - UNU EGOV, 2016)

The fundamental aim of this vision is the use of knowledge to further the human condition. The vision is built upon the principles of freedom of expression, cultural and linguistic diversity, universal access to information and knowledge, and quality education for all. In turn, this vision is enabled by the spread of digital technology (information and communication technologies - ICT) and particularly upon the Internet Universality principles of human rights, openness, accessibility and multi-stakeholder participation (UNESCO, 2015).

There is no specific model of what a KS should be. The plurality of knowledge societies explicitly recognizes the diversity of contexts where knowledge is applied to inform societal-scale decisions. In order to systematically apply knowledge to address the needs, further the aspirations, and enhance the self-development capacities of societies, communities and individuals, the development of knowledge societies requires guidance and coordination from the State and its legislative, executive and judicial branches. The State is also needed to empower businesses, non-profit organizations, academia, other non-State actors and the whole industrial sector to contribute to the development and sustainability of locally appropriated knowledge societies.

The main instruments through which the State can act to guide, coordinate and empower are public policies for knowledge societies.

“The NICI-2010 document represents the culmination of many months of dedicated work from all stakeholders in ICT in Rwanda. We began in mid-2005 by conducting a comprehensive survey and review of the implementation progress of the NICI-2005 policy and plan. During the policy and plan formulation phase, which followed directly after the survey and review, we engaged in extensive dialogues and long deliberations with representatives from government, the private sector, academia and all other interested parties. Then followed the process of synthesizing and crystallizing this wide and varied dialogue into a working document, which had to be both detailed enough to guide implementation and yet simple enough to aid in the overall understanding of the context of our ICT policy.”

Eng Albert Butare, Minister of State in Charge of Energy and Communications in the Preface of Government of Rwanda. An integrated ICT-led socio-economic development plan for Rwanda, 2006-2010, The NICI-2010 Plan

## 1.2 Basic concepts

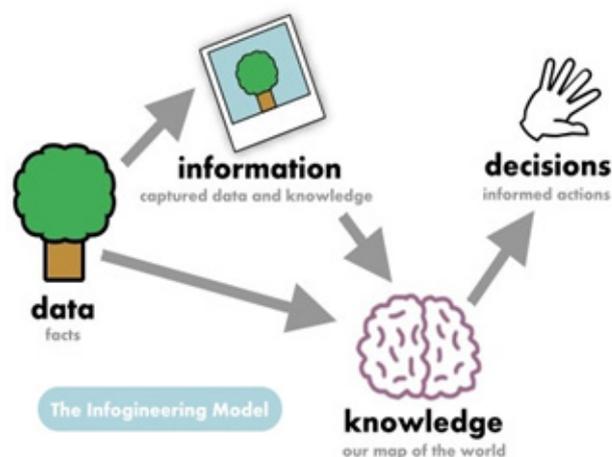
What are the differences between data, information and knowledge?

By data we basically mean facts about the world. Data can be used to calculate, analyse and plan. It can be produced or stored in physical or digital forms. Basically, data is a set of values of qualitative or quantitative variables. An example of qualitative data would be a sociologist's first notes about his or her interviews with people of a vulnerable social group. Pieces of data are individual pieces of information. While the concept of data is commonly associated with scientific research, data is collected by a huge range of organizations and institutions, including governments (e.g., crime rates, unemployment rates, literacy rates), businesses (e.g., sales data, revenue, profits, stock price), and non-governmental organizations (e.g., censuses of the number of homeless people by non-profit organizations).

We need data to produce information, which comprises contextualized, organized and categorized data.

Information is the answer to a question of some kind. Information uses and processes data. It is thus related to data and knowledge, as data represents values attributed to parameters, and knowledge signifies understanding of real things or abstract concepts. The information cycle (addressed as a whole or in its distinct components) is of great concern to information technology, information systems, as well as information science. These fields deal with those processes and techniques pertaining to information capture (through sensors) and generation (through computation, formulation or composition), processing (including encoding, encryption, compression, packaging), transmission (including all telecommunication methods), presentation (including visualization/display methods) and storage (such as magnetic or optical, including holographic methods). Information does not cease to exist; it may only become jumbled beyond any possibility of retrieval.

Finally, knowledge is information organized for a specific context or applied to address a specific need. Knowledge can be defined as the human faculty/ability/capacity resulting from interpreted information; understanding that comes from a combination of data, information, experience, and individual interpretation. In recent years, knowledge has come to be acknowledged as a factor of production (as in knowledge capital) in its own right, and different from labour. In practical fields, such as law, it is understood as the awareness or understanding of a circumstance or fact, gained through association or experience.



It may seem that data, information and knowledge have a hierarchical order, in which data is at the lower level and knowledge at a higher level. However, it should not be forgotten that we need knowledge to determine which kind of data we need, and how to obtain it. The three elements are intimately intertwined.

**Table 1. Examples of data, information, knowledge, technology and innovation**

Examples of data	Examples of information	Examples of knowledge	Examples of technology	Examples of innovation
<ul style="list-style-type: none"> <li>• Access to electric power for schools</li> <li>• Number of computers used in schools</li> <li>• Schools with electric power</li> <li>• Attendance lists</li> <li>• Data from surveys and interviews</li> <li>• Data from questionnaires</li> <li>• Number of teachers trained</li> <li>• Number of students in class</li> <li>• Age of students</li> <li>• Interests of students</li> <li>• Potential collaborators</li> <li>• Best practices everywhere</li> </ul>	<ul style="list-style-type: none"> <li>• Report on distribution of computers to schools</li> <li>• Activity report (teaching)</li> <li>• Report of teachers trained by the district</li> <li>• Age average for a class</li> <li>• Tech access rate</li> <li>• Research reports</li> <li>• Technology used</li> <li>• Net enrolment rate</li> <li>• Gross enrolment rate</li> <li>• Factors that lead to dropping out/retention</li> </ul>	<ul style="list-style-type: none"> <li>• Skills of computer use in teaching and learning</li> <li>• Ability to conduct interviews using laptops</li> <li>• Progress report to inform teacher training</li> <li>• Scientific papers</li> <li>• Strategies to improve enrolment</li> <li>• Instructional design principles</li> </ul>	<ul style="list-style-type: none"> <li>• Record-keeping system</li> <li>• Learning platforms</li> <li>• Projectors, videos, as teaching and learning tools</li> <li>• Kindle and other electronic reading devices</li> <li>• Broadband internet</li> <li>• Management information systems</li> <li>• Internet connection</li> <li>• Digital learning material</li> <li>• Computers in schools</li> <li>• Social media</li> <li>• Learning management systems</li> <li>• Collaborative learning technologies</li> <li>• Survey technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Design of web-based applications for teaching and learning</li> <li>• Teachers' integration of ICT in teaching and learning</li> <li>• Use of ICT resources in teaching</li> <li>• Improving technology/learning support via social media</li> <li>• Introducing innovative planning for teachers to improve professional practice</li> <li>• Open resources adaptation</li> </ul>

**Source:** Rehema Baguma, Workshop Report, Capacity Building Workshop on Knowledge Societies for Government Administrators and Education Officials in Rwanda, 18-19 May 2017, Kigali, Rwanda

What is the relation between technology and knowledge?

Technology plays an important role in the production and management of data, information, and knowledge. In turn, technology is defined by the Merriam Webster dictionary as the practical application of knowledge. It also means a capability given by the practical application of knowledge. Another meaning refers to a manner of accomplishing a task, especially using technical processes, methods, or knowledge.

### Activity:

Take some minutes to reflect about the differences between the concepts of data, information, and knowledge

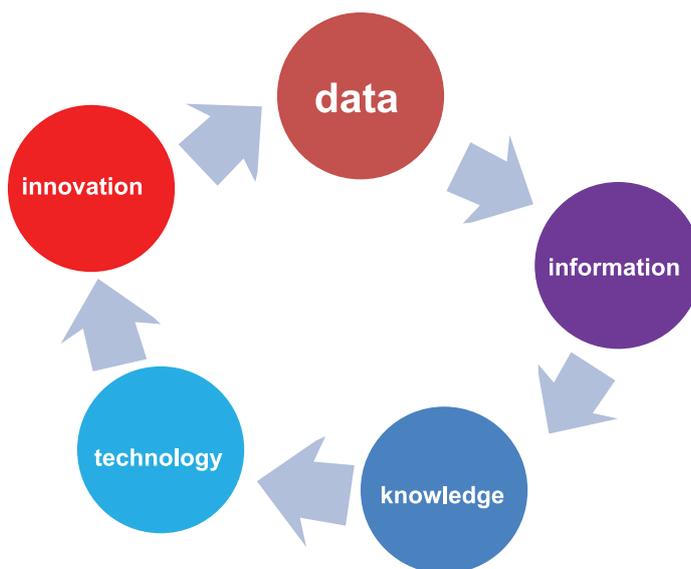
## Data, information, knowledge, technology and innovation

When data, information, knowledge and technology work together, they often generate innovations. There are many definitions of innovation, including “specific function of entrepreneurship, whether in an existing business, a public service institution, or a new venture started by a lone individual in the family kitchen. It is the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth” (Drucker, 2002<sup>5</sup>).

Innovation is not limited to the productive sector. It may be understood as a social process, developed everywhere, with the support of different social actors (governments, academia, enterprises and citizens, among others). Focusing solely on innovative processes or products in business or enterprises entails disregarding innovations such as new forms of social organization, open source software, and even the Internet. Moreover, innovation is not limited to products and services. There are innovative organizations, innovative ways of production and different ways to accomplish a given task.

Knowledge and innovation both work together and are inseparable from each other. They steer economies around the world. Innovation is the application or transmission of knowledge through a process from research to development to application. In turn, sharing knowledge through collaborative innovation becomes more and more important.

**Figure 2: Data, information, knowledge, technology and innovation**



<sup>5</sup>. Drucker, Peter F: *The Discipline of Innovation*, in the *Harvard Business Review*, August 2002 issue, available at: <https://hbr.org/2002/08/the-discipline-of-innovation>

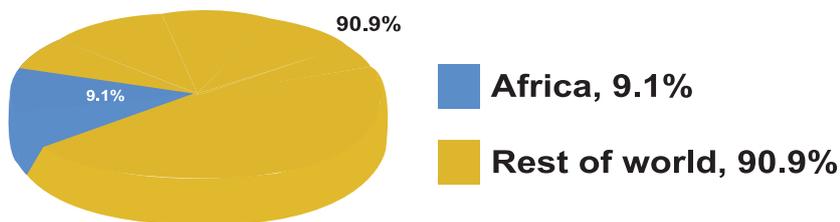
**Information society**

The expression “information society” defines a society in which the creation, distribution and treatment of information, based on the use of ICT, have become the most significant economic and cultural activities. An information society is frequently contrasted with societies in which the economic foundation is primarily industrial or agrarian.

The digital divide remains a global challenge in information society. Around 40% of the world population has an Internet connection in 2017, according to the Internet World Stats. In 1995, it was less than 1%. Despite the growth in Internet penetration in the world, the distribution of access between developed and developing countries, between urban and rural communities and even between different age groups and genders is still inequitable. In Africa, in March 2017, the percentage of Internet penetration was 26.9%, or 9.1% of total world users. The resources required to bridge all these divides is far beyond the means of UNESCO and other international organizations. Many governments also view this as outside their means.

**Figure 3: Internet users in Africa and in the world**

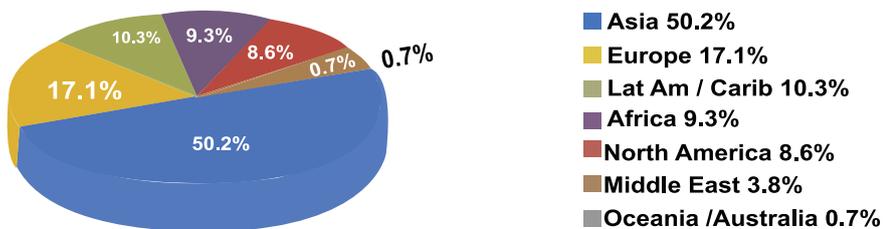
**Internet Users in Africa  
March 2017**



**source: Internet world Stats - www.internetworldstats.com**  
**335,453,374 estimated internet Users in Africa in March 31, 2017 with a 26.9% penetration and 9.1% of total world users**  
**Copyright © 2017, Miniwatts Marketing Group**

**Figure 4: Internet penetration around the world<sup>6</sup>**

**Internet Users in the World  
by Regions - March 25, 2017**



**Source Internet World Stats - www.internetworldstats.com/stats.htm**  
**Basis: 3,731,973,423 Internet Users on March 31, 2017**  
**Copyright@2017, Miniwatts Marketing group**

<sup>6</sup> See Internet penetration in Africa by country at: Africa 2017 population and Internet users statistics for 2017, <http://www.internetworldstats.com/stats1.htm>

## Knowledge societies

Knowledge societies are identified as societies based on the creation, dissemination and utilization of information and knowledge.

They are societies with economies in which knowledge is attained, created, disseminated and applied to enhance economic and social development. The OECD refers to “knowledge-driven economies” to signify the complex and all-encompassing change leading – though at a different pace in different parts of the world – to the emergence of knowledge societies and economies.

Knowledge societies can also be defined as human-structured organizations founded on contemporary knowledge and representing new quality of life support systems. This indicates the need for understanding of distribution of knowledge, access to information and capability to transfer information into knowledge. In short, knowledge society refers to a society in which the conditions for generating knowledge and processing information have been greatly changed by a technological revolution focused on information processing, knowledge generation, and information technologies.

### Activity:

Discussion: Take a minute to reflect on the concepts you have read about knowledge societies. What are the main traits of KS? Is your country planning to become one? Do you know about African initiatives to build regional or national knowledge societies?

There is not a single model of what a knowledge society is or should be. The concept “encompasses much broader social, ethical and political dimensions. There is a multitude of such dimensions which rules out the idea of any single, ready-made model, for such a model would not take sufficient account of cultural and linguistic diversity, vital if individuals are to feel at home in a changing world. Various forms of knowledge and culture always enter into the building of any society, including those strongly influenced by scientific progress and modern technology. It would be inadmissible to envisage the information and communication revolution leading – through narrow, fatalistic technological determinism – to a single possible form of society” (Bindé and Matsuura, 2005<sup>7</sup>).

Every society has its own knowledge advantages and strengths. No society starts at ground zero. It is hence forth essential to work towards connecting the forms of knowledge that societies already possess, including traditional knowledge, and new forms of development, acquisition and spread of knowledge valued by the knowledge economy model and supported by ICT. This is why this handbook refers to the plural concept of knowledge societies.

<sup>7</sup> BINDE, J.; MATSUURA, K. (2005) Towards knowledge societies. Paris, UNESCO world report. Available at <http://goo.gl/YjhJTm>

**Example: The Kenya ICT Action Network (KICTANet)**

The impetus for a multi-stakeholder process in Kenya arose from a recommendation of the World Summit on the Information Society and long-standing collaboration between civil society and the private sector in advocating for different ICT policy changes in Kenya over the last two decades. KICTANet was initiated by civil society organisations in October 2004 during a meeting organised by the Media Council, APC, the DFID-supported CATIA programme, TESPOK (Telecommunications Service Providers Association of Kenya), Summit Strategies and the Kenya WSIS Civil Society Caucus. These organizations together with the Kenya ICT Federation (KIF) formed the initial members of KICTANet.

The initiators of KICTANet were facing common problems relating to ICT policy in Kenya and felt that their individual goals could be achieved by focusing on the collective goal of sharing resources and skills, stimulating debate and catalysing the policy process. Through interaction with stakeholders, awareness creation, mobilization of the private and public sectors and civil society around policy issues and encouragement of synergies, KICTANet was able to achieve trust and social legitimacy among policy-makers, international institutions and the general public in Kenya. KICTANet played a catalytic role in facilitating ICT policy changes in the country.

**Source:** Lishan Adam, Tina James, Alice Munyua Wanjira: Frequently Asked Questions about Multi-Stakeholder Partnerships in ICTs for Development, A guide for national ICT policy animators, CATIA, 2007

**Knowledge societies for development; an example from Estonia<sup>8</sup>**

Before the Second World War, Estonia's economy was based on agriculture, but there was a significant knowledge sector, with the university city of Tartu known for scientific contributions, and a growing industrial sector, similar to that of neighbouring Finland. The annexation of Estonia in 1940 by the Union of Soviet Socialist Republics (USSR) and the ensuing Nazi and Soviet destruction during World War II crippled the Estonian economy. Before the war, Estonia and Finland had relatively similar standards of living. By 1987, capitalist Finland's GDP per capita reached \$14,370, while communist Estonia's was around \$2,000.

After Estonia became an independent capitalist economy in 1991, it emerged as a pioneer of the global economy. Oil shale energy, telecommunications, textiles, chemical products, banking, services, food and fishing, timber, shipbuilding, electronics, and transportation are key sectors of the economy. The GDP (PPP) per capita of the country was \$23,631 in 2012 according to the World Bank. Because of its economic performance Estonia has been termed one of the Baltic Tigers. (Source: Wikipedia)

<sup>8</sup> IFAP – UNESCO / UNU EGov (2016)

Nowadays Estonia's economy relies heavily on knowledge as defined by its research, development and innovation (RDI) strategy. The overall aim of the development of RDI is to create favourable conditions for an increase in productivity and in the standard of living, for good-quality education and culture, and for the country's longevity and development.

This strategy establishes four main objectives: (1) research in Estonia is of a high level and diverse; (2) research and development (RD) functions in the interests of the Estonian society and economy; (3) R&D makes the structure of the economy more knowledge-intensive; and (4) Estonia is active and visible in international RDI cooperation.

**Source:** (Estonian Ministry of Education and Research, 2014)

Generating and developing knowledge societies is a key element for Sustainable Development, as defined in the 2030 Agenda for Sustainable Development<sup>9</sup> adopted by the United Nations in 2015. The 2030 Agenda is guided by the purposes and principles of the Charter of the United Nations, including full respect for international law. It is grounded in the Universal Declaration of Human Rights, international human rights treaties, the Millennium Declaration and the 2005 World Summit Outcome Document. It is informed by other instruments such as the Declaration on the Right to Development.

The 2030 Agenda decides, between 2016 and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. It has also resolved to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities.

How can knowledge societies contribute to the achievement of these goals? In the first place, the accumulation of knowledge is intrinsic to science and technology development. It represents quality and quantity in the description and understanding of our perception of material, social and cultural life. The connection between diverse quality of life support systems is vital. During the progression of human history the knowledge structure has been formed, leading to the formation of its division into the specific branches devoted to individual entities. With the development of ICT in hardware and software forms, a new opportunity was opened for the further systematization and organization of available knowledge. The knowledge base becomes a powerful tool for organizing knowledge and making available its potential for economic, cultural, and technological development.

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<sup>9</sup> See <http://www.un.org/sustainabledevelopment/development-agenda/>

**Example: knowledge societies for development, Republic of Korea**

Over the past four decades, the Republic of Korea (South Korea) has demonstrated incredible growth and global integration to become a high-tech industrialized economy. In the 1960s, the GDP per capita was comparable with levels in the poorer countries of Africa and Asia. A scarcity of natural resources has motivated the country to look at human capital as its biggest endowment, and the country has invested heavily in education, science and technology, and a “knowledge-based” economy.

Through state-led research and education and corporate research and development (R&D), a robust science and technology capacity has been developed. The country is currently emphasizing R&D in the areas of green technologies, value-added services, and technology convergence—merging telecommunications and network technologies into a single device, for example. The government also ensures that, through its support of industry-oriented research centres, there is a central locus of research geared towards the development of platform and infrastructural technologies (fundamental technologies that enable subsequent creation of other products and processes).

In 2004, the Republic of Korea joined the trillion-dollar club of world economies, and it is currently the world’s 12th largest economy. The “Miracle on the Han River” is a term used to refer to the country’s post-war export-fuelled growth, including rapid industrialization, technological achievement, and education boom, large rise in living standards, rapid urbanization, modernization, successful hosting of the 1988 Summer Olympics and co-hosting of the 2002 FIFA World Cup. This growth was accompanied by a democratization and globalization that transformed the country, following the destruction of the Korean War, into a wealthy and developed country with a globally influential economy and prominent multinational conglomerates such as Samsung, LG and Hyundai.

**Source:** (Gupta, Healey, Stein, and Shipp, 2013)

Knowledge societies represent a new paradigm for future development and are strongly related to sustainable development. The sustainability paradigm of knowledge societies is a potential frame for human society development heading to social cohesion, economic competitiveness and stability, use of resources and economic development and safeguarding biodiversity and the ecosystem.

**Activity:**

Discussion: Which fields of action are more advanced in Africa, and particularly in Rwanda, regarding knowledge societies? Which fields need more efforts from national governments and international organizations?

## 2. KNOWLEDGE SOCIETY POLICIES

### 2.1 What is a knowledge society policy?

A policy can be defined as a development or general plan of action embraced by a governmental organization, multisectoral body, party or person. A policy for knowledge societies (KSP) can be described as a plan or road map for the inclusion and appropriation by governments, institutions, communities and individuals of the benefits derived from the construction and permanent development of knowledge societies at the local, national or international level.

Technological change and knowledge is advancing and is being propagated at the fastest pace known in history. Accordingly, governments have to keep up with this pace, generating not only long-term policies, but also strategies for the short and medium terms, which will produce results visible to the actors involved and to the general population. Within this context, it is important to implement access to information and knowledge for all, so all persons and organizations will be able to profit from the advantages of knowledge societies, including co-creating knowledge.

Looking at the many efforts around the world, there is no general or unique formula for successful ICT policies and e-strategies. Government officers, expert teams and policymakers in countries having diverse levels of development may identify examples of successes or best practices either within their own territories and regions, or in other countries with similar conditions, and adjust them as needed to fit their unique local circumstances.

The KSP is a highway, not a harbour. It is a process, a collaborative, open, and permanent building task. In order to travel this highway, it is necessary to envision it, to plan and build it, to make it accessible for all citizens (Finkelievich et. al., IFAP - UNESCO, 2010<sup>10</sup>).

#### **Example:**

Rwanda established its National Information and Communication Infrastructure policy and plan for 2006-2010 (NICI-2010<sup>11</sup>). This plan was generated to guide the country in the adoption and exploitation of modern information and communication technologies to increase the pace of socio-economic development and create value for all citizens. It is the second in a series of four documents, spanning the 20 years required to realise the country's Vision 2020, which aims to bringing Rwanda to the level of a middle income, service- and knowledge-based economy by the year 2020.

<sup>10</sup> "Public Policies for Information Society. A Template", Susana Finkelievich, Adrián Rozengardt, Alejandra Davidziuk y Daniel Finkelievich, UNESCO, Communication and Information Sector, Information For All Programme (IFAP), Paris, 2010, available at: [http://portal.unesco.org/ci/en/files/29360/12602731983IFAP\\_Template\\_en.pdf/IFAP\\_Template\\_en.pdf](http://portal.unesco.org/ci/en/files/29360/12602731983IFAP_Template_en.pdf/IFAP_Template_en.pdf).

<sup>11</sup> See [http://www.ist-africa.org/home/files/Rwanda\\_NICI2010.pdf](http://www.ist-africa.org/home/files/Rwanda_NICI2010.pdf)

## 2.2 National, Regional and Local Context

### Why are explicit policies necessary?

Public policies basically show the intentions of government. Without policies, there can be no governance. To govern there must be a set of guidelines, and public policies to provide those guidelines. Policies enable the public to measure the achievements of the government. If there is an explicit public policy, it can be assessed or criticized by citizens. A policy document lists the intentions or objectives of the government for a particular department or area of government. The fact of discussing a KSP makes governments, as well as the other stakeholders, associate, access and socially appropriate ICT with public policy-making. As mentioned before, knowledge society policies are those which consider the overall development of governmental responsibility in the construction and permanent development of an information society suited to each country's context, specificities, needs and potentials.

A country has a KSP when such a policy is explicit in an official document, or implicit in a higher hierarchy document such as a national development plan. The same is true for regions and cities: actions alone are crucial, but they are not sufficient; governments and other social agents have a KSP when these actions are specified, planned and coordinated in official documents.

#### **Example:**

The Swedish Innovation Strategy<sup>12</sup> (2015).

The strategy presents long-term guidelines for how work within many policy areas until 2020 can create better conditions for people in all parts of society to contribute to a more innovative Sweden through their knowledge, skills and creativity. The purpose of this strategy is to contribute to a climate with the best possible conditions for innovation in Sweden with the year 2020 in sight. People and organizations in industry, the public sector and civil society will be able to develop and more effectively contribute to new or improved solutions meeting needs and demand. Societal challenges faced by Sweden, together with the rest of the world, are big and complex in nature. Therefore, no single actor or area of society has sufficient knowledge or resources to meet these challenges on its own. It is important to further develop coordination between different actors in order to create the best conditions possible for innovation. The development of this innovation strategy has taken place in broad consultation with stakeholders in different parts of society. The work was conducted with a high degree of involvement from all ministries within the Government. This strategy constitutes a basis for a long-term way of working in order to enhance the Swedish innovation climate and innovation capacity.

<sup>12</sup> <http://www.government.se/contentassets/cbc9485d5a344672963225858118273b/the-swedish-innovation-strategy>

**Activity:**

Take some minutes to think about explicit KS policies in the world, in Africa, in your country. Which ones can you mention? Which ones seem most appropriate or the development of its respective region or country?

Consideration of national, regional and/or local contexts involves analysing and diagnosing national politics and economics as well as the country's e-readiness, and linkages with the international context, to interpret the information situation and identify development issues to be addressed. Some of the issues to be reflected upon are:

1. The degree of awareness and engagement of political groups regarding Knowledge society: If a government is informed and willing to create a KSP to fully build its specific knowledge society, it will be supportive of and receptive to the transformations proposed by the KSP.
2. The State agency in charge of the KSP: An important issue to consider is the hierarchical level held by the agency, group or person mandated to lead the national strategy. The higher the hierarchical level, the stronger will be the support for the policies proposed by that agency or group and the greater the chances of implementing them in practice. Other factors include working procedures and the special coordination of the participants' work.
3. Infrastructure and generic ICT services: The most evident thematic topics of KS strategies focus on the building and distribution of ICT infrastructure and services. Depending on the characteristics of each country's infrastructure and ICT services and the numbers and location of the underserved population, policies should be aimed at promoting universal access and technology use by providing a basic minimum of connectivity for the whole of society, with special emphasis on marginalized groups such as rural inhabitants, ethnic minorities, women, the disabled and the elderly.
4. Regulatory frameworks: National regulatory frameworks are key elements in the formulation of KSP. They need to be established or adjusted in order to ensure the concrete implementation, assessment and renovation of national policies. Regulation of the telecommunications industry and the strengthening of hardware and software markets are key policy areas.
5. Human capital and e-skills: knowledge societies are based on knowledge, which is found, among other repositories, in people. Competitiveness, innovation and job creation in knowledge societies are increasingly being driven by the use of ICT. This must be supported by a qualified workforce with the knowledge and skills to use these technologies competently. Shortages and disparities in e-skills negatively affect growth, competitiveness, innovation, employment and social organization in many countries. As technologies develop rapidly, the skills required to use them become more and more complex and need to be continuously updated. Improving the level of e-skills in the labour force requires action at national, regional, and local levels in education, training, research, industrial and labour policies, and also in areas such as immigration and taxation policies. It is then necessary to analyse and diagnose the existence of human capital related to knowledge society and to knowledge economy (e-skills). In other words, it is necessary to know which skills are available and which skills need to be built through education and training.

6. Improving education systems: Most countries have recognized the urgent need to reform their education systems and enable lifelong learning to create and constantly update e-skills. Yet implementation of these improvements is still uneven, within and between countries. Priorities include:
- Investing in education at all levels, and creating opportunities and incentives for private sector investment in education and lifelong training in e-skills. E-skills means the effective application of ICT systems and devices. They vary from ICT specialists who have the ability to develop, operate, and maintain ICT systems, to basic ICT users, who are capable users of the mainstream tools needed in their working life.
  - Focusing governmental interventions on key issues of quality, relevance, impact of education, and access for all.
  - Integrating formal, informal, technical, and adult and distance education and training to provide a greater range of opportunities for life-long learning.
  - Creating policy and regulatory frameworks, including certification schemes, which may make life long learning opportunities attractive and easy for people to pursue.

#### **Example: Uganda**

One of the crucial documents for understanding the future of Uganda is its development policy, Vision 2040, which wants to create “A transformed Ugandan society from a peasant economy to a modern and prosperous country within 30 years”. The newest ICT Policy draft 2012 can be considered critical for Uganda as a knowledge society. Its Vision is “A knowledge society where Information and Communications Technology (ICT) is central in all spheres of life”, while its mission is “To leverage ICT for transformation of Uganda into a knowledge society by 2025”. It also specifies that “In its long term vision, the government of Uganda, like all other countries, aspires to be a globally competitive and prosperous nation with a high quality of life within the shortest time possible. Aware that ICT has the potential to impact economic growth by providing the catalytic role to other sectors, this new ICT policy is aimed at supporting the realization of the national vision.”

The broad policy objectives of the draft national ICT policy of 2012 are: (i) Build a knowledge based human capital; (ii) Promote innovation in economic and social systems; (iii) Expand ICT infrastructure and its integration throughout the country; (iv) Deepen utilization of ICT services by government, private sector, not-for-profit organizations and the citizenry; (v) Enhance research and innovation in ICT products, applications, and services; and (vi) Improve ICT governance and environment in Uganda.

#### **Activity:**

Take some minutes to think about the national and local contexts in your country. Do you think they are favourable for generating, implementing and updating KSP? Why?

## The role of education and training in knowledge societies

Education is one of the fundamental factors of development. It increases the quality of life and leads to broad social benefits for individuals and society. Education in modern societies is producing relevant knowledge and values, which play a vital role for the progress of civilization in general. Education, particularly higher education, can contribute to innovative technical and technological development in society, which enables the increase of economic capacities and material goods, by which unemployment and poverty are decreased and the welfare of economy and society increase.

At present, education and training is considered as one of the European Union's policies for competitive economies based on knowledge. This is highlighted in the programme Europe 2020: "Education and training have a fundamental role in achieving the objectives of the European programme for economic growth based on knowledge, by equipping citizens with the skills and competencies that are necessary for the economy and EU society with the aim of being competitive and innovative, but also by promoting cohesion and social inclusion" (UNESCO, 2005, 78 ). The EU approach recognizes that quality in all levels of education, including lifelong education, vocational education and training quality are crucial factors for the success of the EU.

Higher education in most countries now consists of a complex network of public or private institutions. In most of the countries past decades have seen a trend towards privatization of education systems. The challenges facing developing countries in education are specific: old infrastructure in education, the decline in the quality of higher education, underdevelopment of research infrastructures, the "brain drain" towards wealthy countries, the reduction of state funding and in certain cases the lack of genuine public policies in this field.

Capacity building and international cooperation, the development of network structures and new technologies could make it possible to establish modern university models in developing countries that would serve to limit the massive flight of brainpower and to favour the transfer of the necessary knowledge and information. These are the prerequisite for knowledge sharing.

Knowledge society public policies (KSPP) need to consider education and lifelong training as priority issues. Educators need not only to receive updating training: they need also to be a part of the generation of KSPP.

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<sup>13</sup>. UNESCO. (2005). Towards knowledge societies.

<sup>14</sup>. Fatmir Gashi: knowledge society in the context of the economic development with a focus in Kosovo, Academic Journal of Business, Administration, Law and Social Sciences Vol 1 No 2 Access online at [www.iipcccl.org](http://www.iipcccl.org) IIPCCCL Publishing, Tirana-Albania July 2015,

**Example: Plan CEIBAL in Uruguay, South America<sup>15</sup>**

Plan CEIBAL is a socio-educational plan that enables the integration and coordination of ICT within the school curriculum, from where they extend to the family and community. The idea is that each state school student and teacher should receive a laptop that has been created specifically for educational purposes. Yet this plan is not simply to provide equipment and access; it also guarantees the ownership of the digital medium and places it in context. The objective is to offer equal opportunities to all citizens by promoting the democratization of knowledge and the inclusion of technology to reduce the existing digital divide. Accordingly, it was necessary to investigate the background of different experiences based on the 1:1 modality; establish the type of training to be provided to teachers and analyse the numerous factors that can affect the process, with the aim of achieving the efficient inclusion of technology in the school environment.

The progress of Plan CEIBAL shows the crucial role played at present by information and communication technology (ICT), both in the area of education and in society in Uruguay. In less than two years, XO laptops were distributed to all of the pupils in the country's public primary schools. Access by 350,000 boys and girls and 18,000 teachers, not only to ICT but also to new forms of education and new social environments, has meant that the country has taken a considerable step forward towards innovation.

The responsible use of ICT leads to an improvement in the quality of education, which represents the final step in UNESCO's "Education for All" programme. High-quality education for all is at the root of scientific research, innovation and social development.

The main idea of promoting social and educational development through ICT emerged in 1967, when Seymour Papert created the Logo programming language with an educational purpose, based on the constructivist theory and children's use of computers. However, the decisive element which made the vision of distributing one laptop to each child come true was the technological progress achieved at the end of the millennium, and the Internet. In the global context of the "one laptop per child" initiative, the pioneering role of Uruguay stands out. It was the first country in the world to systematically distribute one laptop to every student in its state primary schools. For this reason, the vision and implementation of Plan CEIBAL in Uruguay has attracted worldwide attention.

**Example: Rwanda, Digital Ambassadors Programme (DAP).**

Using this innovative, 'triple-win' approach, DAP will accelerate digital inclusion in the country and create new opportunities for youth as they work as Digital Ambassadors to deliver digital literacy programmes in rural communities. DAP will employ 5,000 young Rwandans, aiming for 50%

<sup>15</sup> UNESCO (2011): "Plan Ceibal in Uruguay. From pedagogical reality to an ICT road map for the future", Montevideo, [http://www.anep.edu.uy/anep/phocadownload/Publicaciones/Plan\\_Ceibal/plan%20ceibal%20in%20uruguay.pdf](http://www.anep.edu.uy/anep/phocadownload/Publicaciones/Plan_Ceibal/plan%20ceibal%20in%20uruguay.pdf)

participation of young women and girls, as they serve as digital skills trainers. By doing so, they will impact the lives of five million citizens by providing hands-on training in the use of information and communication technologies (ICT), Internet and mobile applications.

“Young Digital Ambassadors receive essential ICT, facilitation and soft skills and will spend time in their communities getting to understand the needs and challenges of community members while providing digital solutions and training,” said Janet Longmore, founder and CEO of DOT. “DAP is an innovative and youth-led approach to economic development and digital inclusion – we are inspired by the commitment of MYICT and our network of partners in Rwanda to making this a highly impactful initiative that will create new opportunities and transform communities.” The training will focus on basic digital literacy, because this is an important first step for many rural Rwandans who have little or no experience using the Internet. But it will also extend to more in-depth training for ordinary citizens to use e-services such as e-gov and e-business services.<sup>16</sup>

The Government of Rwanda is using ICT to implement more than a few of the United Nations’ Sustainable Development Goals (SDGs). The DAP project seeks to address SDG 5, SDG 8, SDG 10, and SDG 17, as it goes beyond access and digital literacy, with a strong focus on jobs and skills, aiming to reduce inequalities within the country.

Expanding access to the Internet is a priority, as it will aid in expanding economic opportunities for all citizens. The Rwanda Utilities Regulatory Authority (RURA), in collaboration with other stakeholders, is implementing measures towards universal access for all Rwandans. Some of the measures include e-learning and e-service centres in rural areas, subsidizing the cost of Internet in rural areas to ensure affordable access to Internet services and supporting people with disabilities to have equal opportunities and access to ICT.<sup>17</sup>

### Activity:

Discuss the role of education and educators in knowledge societies. Do you think that educators play a key role in current KSP? Do educators participate in the generation, implementation and evaluation of KSPs?

<sup>16</sup> Source: World Economic Forum, <https://www.weforum.org/agenda/2017/02/rwandas-digital-ambassadors-are-boosting-computer-literacy/>

<sup>17</sup> Source: World Economic Forum, <https://www.weforum.org/agenda/2017/02/rwandas-digital-ambassadors-are-boosting-computer-literacy/>

### 3. BUILDING KNOWLEDGE SOCIETY POLICIES

The fast pace of technological innovation requires that governments periodically monitor, assess and update their knowledge society policies (KSP). Internet of things, artificial intelligence, robotics, technological convergence, wireless access, triple play, interactive television on mobile phones, new services to citizens, Internet 2.0, traceable devices, wearable technologies, and new software applications are drastically shifting the terms of the debate on KSP.

At present, it is not only necessary to access technology and it is not enough for citizens to socially appropriate these technologies. It has become necessary to access and to create diversified contents. It has become crucial to prepare national capacities to negotiate and achieve a certain level of development using technologies.

#### 3.1 Explicit public policy functionalities

The construction and updating of explicit public policies for a KS normally has the following stages:

1. Inviting public institutions (including Universities) to analyse their situation regarding an information society, e-readiness, etc., in order to base public policies on the needs, demands, and aspirations identified. E-readiness refers to a country's capacity and state of preparedness to participate in the electronic world. The state of maturity is commonly measured by the country's information and communications technology (ICT) infrastructure and the ability of its government and citizens to utilize the positive impacts of ICT for sustainable development.<sup>18</sup>
2. Inviting representatives of all sectors (government, private enterprises, science and technology, civil society organizations) to participate in the generation, implementation and/or updating of the KSP.
3. Relating information society strategies to overall national policies and strategies.
4. Identifying common goals, visions and missions.
5. Redressing market failures or insufficiencies through legal frameworks and regulation (IFAP Template, 2009, and Knowledge Societies Policies Handbook, 2016).

According to UNESCO's IFAP National Information Society Policies Template (2009), countries develop knowledge society policies to achieve three main goals:

- **To democratize access:** to place within the reach of all persons the means to access and use information and ICT, guaranteeing the enjoyment of citizen rights, fostering education, local development, eradication of poverty, gender equity, digital inclusion, universal access, public transparency and efficiency, and participatory governance.
- **To develop capacities:** to create, support and promote strategies, tools and methodologies to generate capacities and skills to utilize information and ICT for all sectors and societal groups, at all levels of formal and informal education, also disseminating the opportunities

<sup>18</sup> See Wikipedia, <https://en.wikipedia.org/wiki/E-readiness>

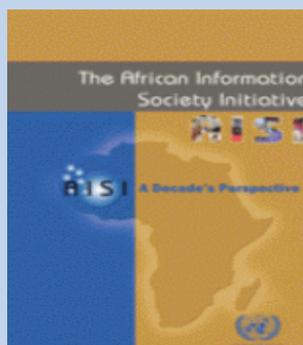
provided by different information management models. In particular, to build capacity for research and technological innovation oriented toward generating one's own knowledge; and to generate national content from public institutions and local content on behalf of different social groups.

- **To achieve an appropriate legal and regulatory framework:** to create the necessary norms and regulations to guarantee the right to information; to encourage utilization of information and of ICT through relevant legal bodies, creating an appropriate, stable legal setting.

**No country starts from zero in the construction and development of a knowledge society.** Multiple existing examples in both developing and developed countries, demonstrate that each country has its own entrance point. Each local, national and regional reality is unique and needs a KS policy adjusted to its circumstances.

### **The African Information Society Initiative (AISI) – A decade's perspective**

The African Information Society Initiative (AISI), launched in 1996 is perhaps one of the most comprehensive regional ICT-for-development frameworks of its kind. Preceding the Geneva



Action Plan of the World Summit on the Information Society (WSIS) of 2003 and the WSIS Tunis Commitments, 2005, AISI can be credited for being a reference point for an African digital vision and agenda in a globalized world. The AISI originated from a 1996 resolution (812 –XXXI) adopted by the ECA Conference of Ministers requesting the Commission to “constitute a high level work group to develop an action plan on ICT to accelerate socio-economic development in Africa”. The ministers were convinced that building Africa’s information society would help the continent to “accelerate its development plans, stimulate growth and provide new opportunities in education, trade, health care, job creation and food security, helping African countries to leapfrog stages of development and raise their standards of living”.

By and large, the first 10 years of AISI have been devoted to laying the necessary foundations and building blocks for the information society in African countries. As evidence, three quarters of ECA's 53 member States now have national e-strategies complimenting their development efforts as well as harnessing their ICT sectors to play a greater role in their economies, through the National Information and Communication Infrastructure (NICI) plans and strategies. Indeed to quote the former President of Mozambique, His Excellency Joachim Chissano: “Ever since the African Information Society Initiative was launched in the mid-90s, a host of achievements have been recorded on the continent: thanks to the Project, intra-African traffic and network integration have improved; tele

density has risen significantly in recent times, telecentres and community multimedia centres are taking root and providing access in under-serviced areas”. Although the AISI vision called for the “formulation and development of NICI plans in every African country”, the strategic objectives of the framework also called on African member States to improve communication services and create a continent-wide information and telecommunication network that will allow for fast and reliable communications to and from the continent.

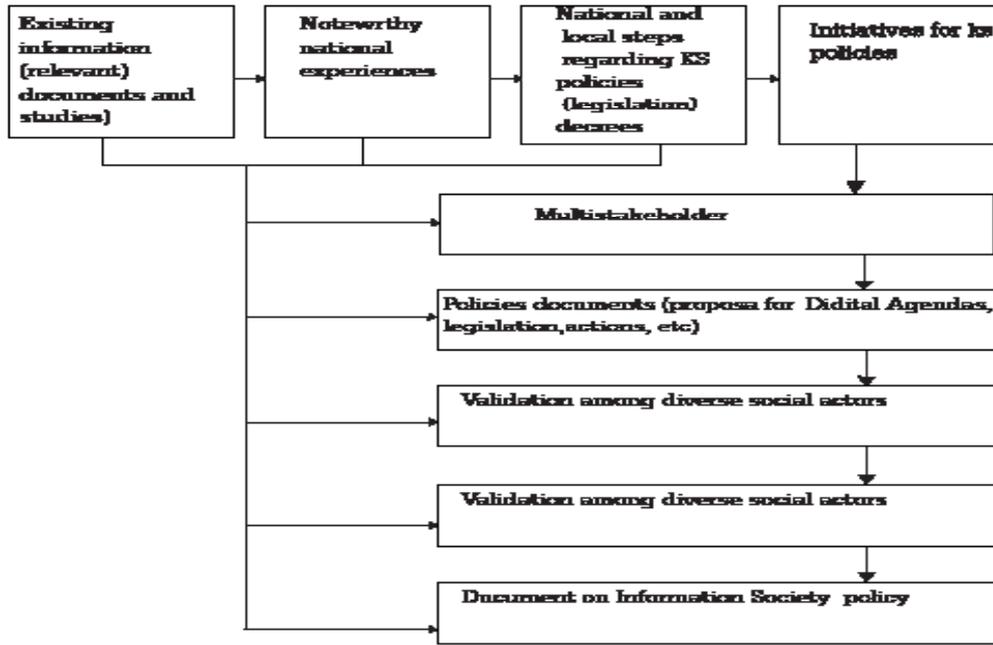
Policy goals are generally formulated and implemented following one or more of six essential overall guidelines, which we have adapted from IFAP’s template and from the IFAP/UNESCO – UNU EGOV Handbook (2016):

1. The United Nations 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs)
2. The 2003, 2005, and 2015 World Summit on the Information Society (WSIS) Declarations: Geneva Declaration of Principles, Geneva Plan of Action, Tunis Commitment, and Tunis Agenda for the Information Society. Other agreements might emerge after WSIS 2013 and the conferences and meetings in preparation for WSIS 2015, as well as post-2015 documents, such as WSIS. (2015). Internet Society Statement at the WSIS Forum 2015. Retrieved from <http://www.internetsociety.org/blog/public-policy/2015/05/internet-society-statement-wsis-forum-2015>
3. Objectives established by regional associations, such as the Economic Commission for Africa (ECA), Common Market for Eastern and Southern Africa (COMESA), African Union, Connect Africa Goals, New Partnership for Africa’s Development (NEPAD) and Transform Africa, among others.
4. Principles and goals established by North-South, North-North and South-South cooperation programmes between regions. An example is the EU 27 cooperation with Africa (Joint European Union – Africa Strategy, 2007). The European Union and the African Union have thus decided to develop a co-owned joint strategy, which “reflects the needs and aspirations of the peoples of Africa and Europe”. Particularly relevant is the thematic Partnership on Science, Information Society and Space.
5. National development goals, as stated in the Millennium Development Goals (MDGs), Rwanda, 2013, UNDP in Rwanda, Eight Goals for 2015<sup>19</sup>, and others.
6. Regional (province, district, sectors in Rwanda) and local development goals, as well as individual community objectives.

*The role of government is mainly to provide an enabling environment for the development of the knowledge society. As we know that a country’s capacity to create wealth is depending less and less on natural resources and more on capacity to transform and add value to the resources, science, technology and innovation (STI) should be encouraged as being key for the advancement of a country. Governments can use their policies and strategies to build a vision for the country, create a regulatory environment and allocate resources to implement the policies. In this way they can integrate the public and private sector interests to provide services to people.*

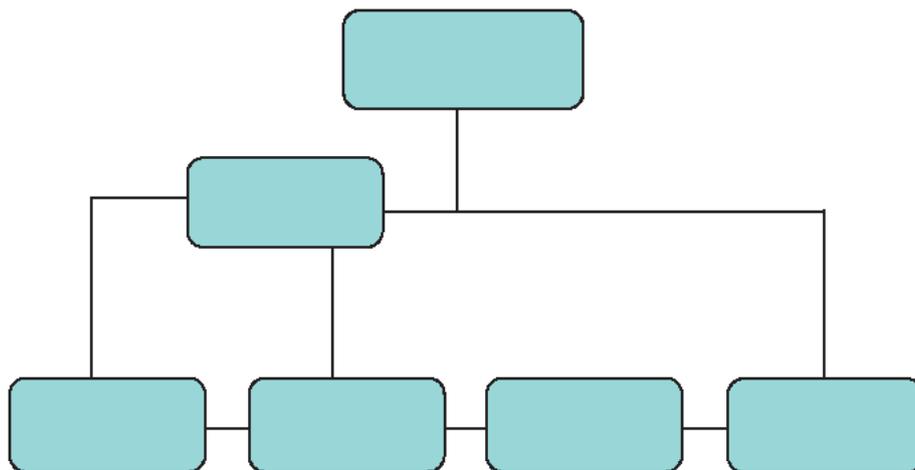
<sup>19</sup>. <http://www.rw.undp.org/content/rwanda/en/home/post-2015/mdgoverview.html>

**Figure 5: Consecutive steps for the construction of a KSP**



### 3.2 Areas of governmental intervention

On a national level, it is crucial that governmental initiatives comprise the entire government, which includes the various ministries, regional governments, as well as local municipalities. The creation of an inter-ministerial institution seems desirable to achieve this goal. It needs to be certain that the programme becomes an initiative of the State, not only the present government in power. However, the most significant factor is that national knowledge society development strategies aim to integrate not only the entire public sector into their decision taking, but also other important development actors, such as the private sector, civil society, and regional and global organizations (IFAP – UNESCO; 2009).



The central idea of multi-stakeholder knowledge society partnerships is joint value creation by all the participating members. Multi-stakeholder partnerships are vital to encourage and implement policy creation and updating, encourage the diverse sectors' involvement, share risks, and find innovative and synergistic ways to pool resources and talents, based on each participant's strengths, capabilities, goals and potentials. (IFAP – UNESCO; 2009).

**The specific goals of multi-stakeholder partnerships in KSP development are to:**

- Identify specific ICT issues that affect social and economic progress and which need priority attention
- Identify the goals of the various social actors and find their compatibilities for a common goal
- Carry out joint analysis and research which will better inform the policy formulation process and subsequent implementation
- Bring together resources, talents and other capabilities of a diverse range of social actors
- Share information on problems and solutions and promote greater levels of understanding and trust between the various stakeholders
- Formulate proposals that consider the interests of the various stakeholders while creating or updating a common information society policy
- Agree on subsequent actions that will involve the various stakeholders

Imagine you are a government officer responsible for identifying and inviting relevant knowledge society stakeholders to take part in updating your country’s agenda for knowledge society. Reflect on whom you would invite and fill in the following action box.

**Action Box 1**

**FRAMEWORK FOR IDENTIFYING KS ACTORS**

Players	Name of Institution	Influential individuals/ positions	Present stance on KSP	Possible contribution
Government (various levels)				
Private sector				
Academic S&T sector				
Civil society				
Other				

In general, a KSP is developed around the following main issues or areas:

- **Telecommunications infrastructure:** develop and support the telecommunications market through transparency and competition, properly managing the electromagnetic spectrum so that innovation can take place (i.e. deployment of Wi-max networks), coordinate infrastructure layout, support the development of regional and local networks, backbones, international links, compliance with standards, Internet governance, etc.

- **Developing the IT industry and related services:** develop local industry for hardware, software and related services, encourage public agencies to develop e-government applications, allowing people and businesses to access government services and conduct business with the government online, developing products and services that can be exported.
- **Promoting applications of IT in all critical areas:** by supporting e-government, e-business, e-education, e-commerce, e-agriculture, e-health, R&D, innovation, e-science and in general, supporting the use of IT in all critical government areas.
- **Making sure citizens are enabled to become active participants of the KS by:**
- **Promoting access and measures that help reduce the digital and access divide:** access strategies like e-rates, providing free access for schools and hospitals, setting up telecentres in critical locations, using buying power for aggregated bandwidth acquisition, creating a universal access fund and administering it to make sure all citizens and all regions have equal access, making sure the whole country is covered, developing programmes to connect minorities, content and culture preservation strategies.
- Training and educating citizens in ICT. Government should play a catalytic role in making access to the knowledge society a reality by enabling acquisition of the requisite skills, aptitude and education, to make sure citizens are able to use technology properly. Basic ICT training is needed, but also business management and organizations using ICT; life-long education and training in courses, professions and skills related to the information society, technical training and specific training to develop the IT industry.

Reflect about the main four areas described above. Identify current KSP strategies by the government of Rwanda. Suggest potential strategies.

### Action Box 2

Areas	Current policies	Potential Policies
Telecommunications infrastructure		
Developing the IT industry and related services		
Promoting applications of IT in all critical areas		
Making sure citizens are enabled to become active participants in the KS		

**Activity:** Fill in the following template with the policies that you know have been implemented, and the potential policies that you think your country needs

**Table 2. Template for the feedback of Action Box 2**

Areas	Current policies	Potential policies
Telecommunications infrastructure		
Developing the IT industry and related services		
Promoting applications of IT in all critical areas		
Making sure citizens are enabled to become active participants of the KS		
Training and educating citizens in ICT		
Add any other areas currently covered in national KS initiatives you think are necessary in the context of Rwanda		

Source: Rehema Baguma, 2017.

### 3.3 Phases of a knowledge society policy

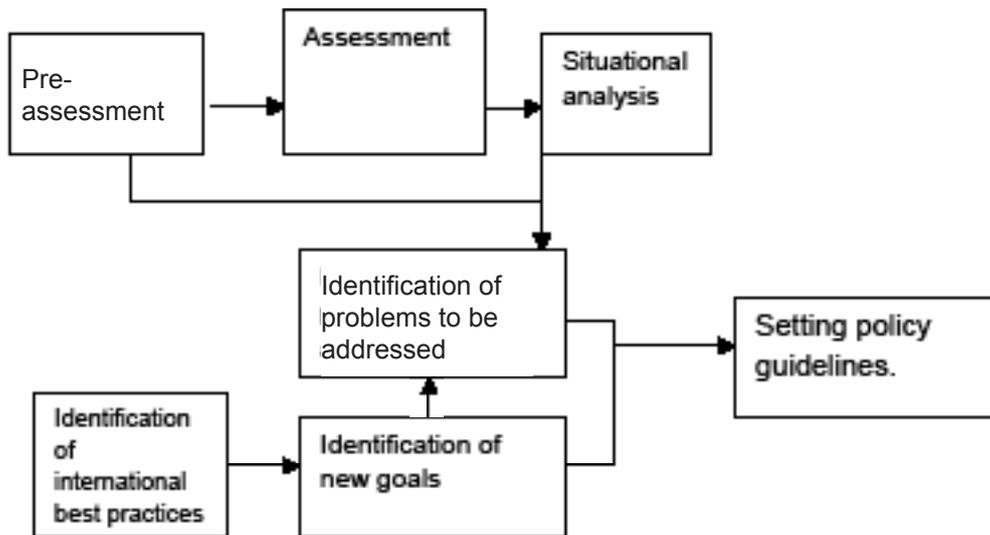
The elements of a KSP involve basic aspects that should be considered when formulating any public policy. These elements are settled after several essential phases of the policy-making process (pre-assessment, assessment and situational analysis to identify and define any problem(s) to be addressed), setting goals for future developments, and setting of policy guidelines.

- 1. Pre-assessment:** This phase is meant to sensitize decision makers about the significance and urgency of beginning a process to develop a national information policy. It involves analysis of the national context and linkages with the international context, to understand the country's situation regarding knowledge society and identify development issues to be addressed. The pre-assessment should involve multi-stakeholders, eliciting their perceptions of the importance of information, knowledge and innovation as a key element of development.
- 2. Assessment and situational analysis:** this phase will identify and analyse all aspects directly related to the national situation regarding e-readiness, the country's situation and aspirations concerning KS, and external issues affecting the national sphere.

The identification of new goals, resulting in the setting of policy guidelines, can also develop from the analysis of national or international best practices in building KSP. The establishment of a public vision on the issue, including a preliminary chronogram or timetable for the accomplishment of the agreed goals, is followed by a process of formulation of policies and strategies, which in turn will be operationally implemented.

Inclusion of different social sectors must be ensured from the outset of the policymaking process, considering them as proactive stakeholders.

**Figure 6: First steps for building a KSP**



Source: IFAP – UNESCO Template (2009)

### 3. Institutionalization and formulation

The vital elements to institutionalize and formulate the KSP are:

- 3.1 The body responsible for formulation:** the entity that will be responsible for working on the vision, goals and plan for the policy.
- 3.2 Vision:** this is the reality to be attained.
- 3.3 Goals and beneficiaries:** goals are the reason for the policy to exist. The beneficiaries are the individuals, communities and organizations that will benefit from the KSP's implementation.
- 3.4 Plan:** actions and activities to achieve the goals; in concrete terms, programmes and projects, the steps to be taken to materialize the vision. According to UNESCO, the plan must specify financial resources, objectives and expected outputs, as well as the persons and institutions who will be responsible for implementing the plan at a given time. The plan contains strategies, i.e. the ways to carry out the plan, achieve the goals and vision.
- 3.5 The body responsible for coordinating implementation:** governments will need to establish an entity to coordinate the implementation of the KSP, and undertake the tasks of management, monitoring and evaluation throughout the implementation.

Now, let us imagine that you are the officer responsible for formulating a KSP for your city. Please take some time to complete the blank spaces in the following action box:

## Action Box 3

### Formulating a KSP

<b>Body responsible for formulation</b> (Name of body and reasons for choosing it)	Vision	
	Goals	
	Beneficiaries	
<b>Plan</b>	Actions	
	Programmes	
	Designation of responsible institutions and people	
<b>Body responsible for coordinating implementation</b> (Name of body and reasons for choosing it)	Choosing an entity capable of managing, monitoring and evaluating the implementation	

## 4. Implementation

**Policy implementation** is the fourth phase of the policy cycle in which adopted policies are put into effect. Implementation makes a policy operational. Getting policy implementation right is critically important; failure can cause financial waste, political frustration and disruption for ordinary citizens, as demonstrated in a series of policy failures under governments of different countries.

The Institute for Government<sup>20</sup> has identified eleven lessons on how ministers and officials can give their policies the best chance of being delivered. These lessons, and particular challenges around implementing policies with a social justice focus, are brought together in the report “Doing them justice”.<sup>21</sup>

The lessons from the Institute’s case studies include:

- **Be clear about the problem:** High-level policy goals need to be matched with analysis of what problem government is trying to tackle and used to make good judgements on where to focus attention.
- **Work with the wider system:** Policies are never implemented onto a blank canvas; they must compete for resources and attention with other national policies and local priorities, and can often draw upon assets that already exist.
- **Stay close to implementers:** Bringing others into policymaking is important but, once implementation begins, central government also needs to keep strong links with areas where change is happening, to understand how policies are working in the real world.

<sup>20</sup> See Institute for Government, UK <https://www.instituteforgovernment.org.uk/our-work/better-policy-making/improving-policy-implementation>

<sup>21</sup> See Institute for Government, UK <https://www.instituteforgovernment.org.uk/publications/doing-them-justice>

- **Stay focused:** Continuity is an essential ingredient of effective implementation. All of our case studies involved implementing over a period of many years and these long time-spans introduce significant risk to the achievement of policy goals.
- **Use ministers to drive progress:** While politics can add many complications to implementation, ministers play a crucial role in setting milestones and using regular stocktakes to keep up momentum.

## 5. Evaluation

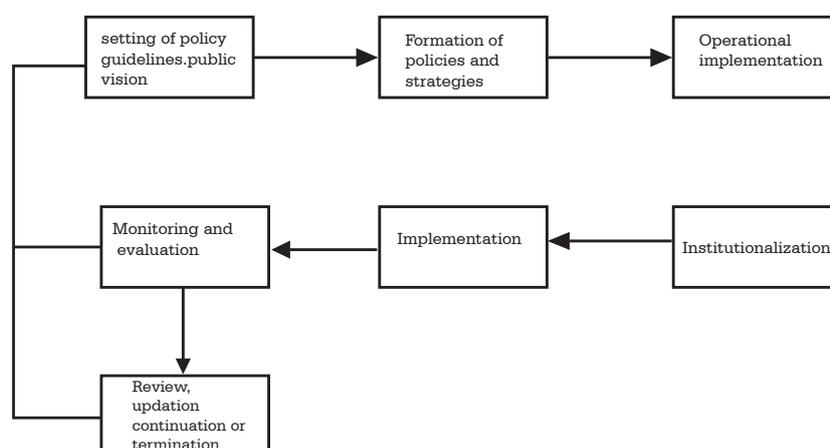
Evaluation is a key phase, measuring and analysing the impact of actions taken to judge whether goals have been attained. Work on a KSP does not end with the final report or action plan. As a matter of fact, KSP work continues through monitoring and permanent evaluation. More specifically, the principal objective of the evaluation of a KSP is to provide an assessment of its relevance, effectiveness and impact, efficiency and utility. An overarching aim of the evaluation is to assess the country's benefit from these initiatives; their impacts at national level and lessons to be learned that may inform work-programme development of the agreed time line. In contributing to better understanding of impact, the evaluation is expected to offer explanatory and where possible causal linkages.

Monitoring and evaluating progress in achieving the goals of a KSP is decisive in actually implementing the chosen goals. Without some indication, signals, even warnings, of how all elements of society are adapting to the installation and application of the KSP, there can be no way of understanding whether the shift towards the construction of an information society or its permanent updating is actually taking place or working in positive ways. Moreover, there can be no understanding of future policy steps without reference to the current status of the policy implementation and application procedures. A multi-stakeholder commission may be appointed in order to periodically monitor and assess effectiveness and impacts.

## 6. Review, continuation or termination

As a result of this process, it may prove necessary to establish corrective measures demanding the formulation of new policy guidelines and implementation of new strategic actions, taking situational shifts into account. The policy can thus be updated. It may also be terminated.

**Figure 7: Building a KS. The process**



Source: IFAP – UNESCO Template (2009)

**Action Box 4**

Think about Africa as it is building its knowledge society. Now, let us use SWOT analysis. SWOT is an acronym for *strengths, weaknesses, opportunities, and threats*.

It is a structured planning method that evaluates those four elements of an organization, project or business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favourable and unfavourable for the achievement of that objective.

- Strengths: characteristics of the business or project that give it an advantage over others
- Weaknesses: characteristics of the business that place the business or project at a disadvantage relative to others
- Opportunities: elements in the environment that the business or project could exploit to its advantage
- Threats: elements in the environment that could cause trouble for the business or project.

Now, reflect on the Rwandan context and fill in the following table:

**Action Box 5**

**SWOT Analysis About Building Knowledge Society Policies In Rwanda**

Internal		External	
Strengths	Weaknesses	Opportunities	Threats

Add more rows if you need them

Source: [https://en.wikipedia.org/wiki/SWOT\\_analysis#/media/File:SWOT\\_Analysis\\_ssw\\_2.png](https://en.wikipedia.org/wiki/SWOT_analysis#/media/File:SWOT_Analysis_ssw_2.png)

## 4. ADAPTATION OF A KNOWLEDGE SOCIETY POLICY TO NATIONAL, REGIONAL, OR LOCAL CONTEXTS

How can a KSP adjust to a given context and vice versa? How can a KSP be adapted to national, regional, and/or local contexts? There are many factors to be taken into account:

- *External political and economic factors:* External factors (international politics, international economy, etc.) are exogenous to political decisions on knowledge society strategies, since the strategies' designers and decision-makers do not have decision-making power over them.
- *International organizations:* International organizations frequently trigger regional and national initiatives to develop knowledge societies, as it was shown in the processes leading to WSIS 2003, WSIS 2005, WSIS 2015, and E-LAC 2014, for example. They also provide assessments for decision-makers and best practices of knowledge society policies.
- *Commercial partnerships:* Commercial alliances or partnerships strongly influence national, regional, and sometimes local policies and strategies. A given government may wish to protect its alliances with a regional bloc (for example, the European Union, or the Africa Global Partnership Platform), adopting measures for a common or coherent knowledge society scheme. On the other hand, external commercial alliances may exclude or economically harm countries, which will therefore adopt policies that try to compensate for this exclusion.
- *Awareness of political groups:* If a government is informed and willing to build knowledge societies to integrate them fully in its country, region, or city, and with the global knowledge society – while respecting its own specificities – it will probably be supportive of and accessible to the transformations proposed by the policy.
- *ICT Infrastructure and services:* The most obvious thematic topics of knowledge society strategies focus on the building of digital infrastructure and services. Depending on the characteristics of each country's or city's infrastructure and ICT services, and the number and location of the underserved population, policies should be aimed at fostering universal access and technology use by providing a basic minimum of connectivity for the whole of society, with special emphasis on marginalized groups, such as rural inhabitants, ethnic minorities, women, the disabled and the elderly.
- *Regulatory frameworks:* National and regional regulatory frameworks are key elements in the formulation of public policies for knowledge societies. They need to be established or adjusted to ensure the concrete implementation, assessment and renovation of public policies. The regulation of the telecommunications industry and the strengthening of ICT markets are key policy areas. An enabling regulatory environment, a favourable investment climate and cooperation and funding from the international community are fundamental elements for the overall development of the knowledge society agenda. It is problematic to define such an "adequate enabling environment", given that each country, region, and city has different needs

<sup>22</sup>. See <http://www.oecd.org/dac/agpp.htm>

and a different level of development. However, some basic requirements for the development of ICT have arisen. These include:

- Appropriate policy adapted to the new demands of the knowledge society, and transparent and non-discriminatory regulation, to favour investment in telecommunication technology, mobilization of new resources and participation of private enterprises in ICT development.
- Cooperation at international, regional and national levels, coordination of efforts, exchange of information, transfer of technology and knowledge and sharing of experiences and best practices.
- Developing knowledge societies in a given context, or adapting a successful policy initiative to it, also means assessing the economic, social, human and technological conditions of a country, region, or city regarding its e-readiness and the existing knowledge societies in place. Studies and research will have to be conducted and used. In some cases, these studies may be produced by chambers of IT enterprises; institutions responsible for statistics and censuses can also provide helpful findings.
- Diagnosing national, regional or local e-readiness may be used by governments as a mechanism to collect the necessary information on which to base the reformulation of the knowledge society goals. This evaluation will help governments to focus their efforts and to identify areas that require the investment of greater resources, external efforts, or extra help. This diagnosis may be conducted by Universities, NGOs, consultants, etc. The role of civil servants or agencies in charge of the process of developing public policies for knowledge societies does not involve actually carrying out these studies themselves, but commissioning them from consultants, professionals or the scientific sector, using their results and the research already available, having stressed clearly their goals and assessed the coherence and accuracy of their results.
- The tools used in different countries for these evaluations relate to diverse definitions of e-readiness and different methods for the measurements, such as indicator systems. The term Policy evaluation broadly refers to all the activities carried out by several state and society actors to determine how a policy has performed in practice and to estimate its probable future performance.
- Outcomes of these evaluations feed back into policy processes with the goal of refining policy design and implementation, conducting policy reforms or even deciding to terminate a policy in some cases. Evaluations differ in their goals, strategies and results. The right tool, in each case, depends on the objective of the user (the evaluator and/or the government).
- The user may choose a tool that measures the theme studied or sought, guided by a standard adjusted to the users' own vision of an e-ready society (UNESCO, 2009: IFAP UNESCO – UNU, 2016).

## 5. WHAT IS NEEDED TO BUILD KNOWLEDGE SOCIETIES IN AFRICA

### a. Information and communication technology (ICT) infrastructure:

An appropriate telecommunications network is essential for the development of a KS, as it provides the infrastructure that enables knowledge to be easily created and shared. These are key factors if a government aspires to transform its country into a knowledge-based economy. “The knowledge based economy” is an expression coined to describe trends in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors. (OECD).<sup>23</sup>

#### General African infrastructure trends:

- Africa has one of the most dynamic telecommunications sectors in the world. Broadband (mainly mobile) is replacing dial-up as the preferred access method, and this process is already virtually complete in the more developed markets. According to the ITU report for 2013, cell phones are used by 63% of the population, Internet users are about 16%, broadband users stand at about 11.2% of the population (10.9% mobile and 0.3% fixed). Of course these are averages, with major differences in terms of ICT development within the region.
- The average price of fixed-broadband services in Sub-Saharan Africa fell by more than 50% in the last 5 years, but services remain far too expensive for many, with prices in 2012 equivalent to almost three times average incomes. Access to submarine cables has reduced the average price but not by as much as initially expected.
- The growth in the African telecommunications landscape can be attributed to a number of factors including the liberalization of telecommunications markets, the subsequent introduction of mobile cellular technologies and the arrival of submarine fibre optic cables to connect the continent to the rest of the world. A quote by the Secretary General of the ITU is instructive. According to Mr Hamadoun I. Touré of ITU: “The growth in telephone access in Africa has been largely fuelled by mobile cellular communications. The change has been so rapid that it has caught many by surprise. From just two countries in 1999, there were 33 African countries that had more mobile than fixed-line telephone subscribers in 2004, more than any other region. The wireless boom has been caused by the combination of sector liberalization – which has seen the licensing of multiple cellular operators in most African markets – and service innovation in the form of pre-paid cards. Africa’s challenge is to sustain this high mobile growth and extend it to other sectors such as the Internet.”
- Africa is now served by at least five submarine cables, up from just one five years ago. Governments and the private sector are busy building national backbone networks in most parts of Africa. Nevertheless, there is still plenty of room for growth. An assessment conducted by ITU in 2007 concluded that, in addition to the existing infrastructure, Africa needs at least

<sup>23</sup>. See <https://stats.oecd.org/glossary/detail.asp?ID=6864>

52,040 kilometres of backbone infrastructure for connectivity within and among countries. ITU estimates that some 55% of the total rural population of sub-Saharan Africa remains without access to ICT. New wireless technologies promise to offer new possibilities for extending access to rural areas.

## **b. ICT Infrastructure intervention areas**

It is impossible to build a knowledge society without appropriate telecommunications infrastructure. To illustrate this, the Objective defined in Uganda's 2012 Draft ICT Policy states: "To ensure efficient management and utilization of telecommunications resources for sustainable socioeconomic development".<sup>24</sup>

### **Telecommunications market action lines:**

- Maintain a fully liberalized subsector in order to attract additional investment in the sector.
- Further strengthen a legal and regulatory environment that supports development of the country's telecommunications subsector.
- Review existing legal frameworks to provide a competitive environment that facilitates and encourages investment in the telecommunications sector; supporting and promoting a liberalized, competitive and innovative telecommunications sector.
- Promote a pricing and tariff regime that incorporates fair interconnection rates and facilitates the achievement of affordable telecommunications services, including special pricing models for education and health (E-rate pricing model).
- Provide incentives such as tax relief for network infrastructure, ICT development, application tools and software, and reduction of excise tax as well as VAT on ICT end-user equipment in order to improve access and affordability.
- Provide for a legal and policy framework for government to monitor and establish a baseline for collection of revenue from national and international telecommunication traffic.
- Enforce fair and efficient management of scarce resources such as spectrum, numbering and rights of way.
- Enhancing public private partnership in delivery of ICT infrastructure and services.

### **Interconnection and Backbones:**

- Establishment of a centralized mechanism to plan, build and manage all public communications Infrastructure in a coordinated manner.
- Encourage participation of the private sector in IT infrastructure development (shared public-private investment in infrastructure).
- Optimize the operations of the national Internet Exchange Point and participate in the establishment of regional and international Internet Exchange Points.
- Integration of communication, broadcasting and information infrastructure and systems (convergence). Implement the migration roadmap from analog to digital broadcasting.

<sup>23</sup> National Information and Communications Technology Policy for Uganda, Ministry of Information and Communications Technology, [https://www.ict.go.ug/sites/default/files/Resource/ICT\\_Policy\\_2014.pdf](https://www.ict.go.ug/sites/default/files/Resource/ICT_Policy_2014.pdf)

- Promotion of reliable and affordable ICT infrastructure in rural, remote and other underserved areas.
- Optimize connectivity to undersea fibre-optic cables on the East African coast.

### c. E-Readiness

#### What is E-Readiness?

E-readiness has been described as the maturity of citizens, businesses, NGOs and governments for participating in the electronic world (e-commerce, e-government etc.). It also defines the readiness of a country, region or entity (such as a corporation) to utilize information and communication technologies for sustaining welfare and growth. Other definitions refer to e-readiness as the ability to use ICT to develop one's economy, to foster one's welfare, and better participate in global socio-economic value chains.

Defined in terms of availability of ICT infrastructure, e-readiness refers to the accessibility of ICT to the general public and business population and the effect of legal and regulatory frameworks on ICT use in, for example, an e-government strategy. The concept includes the degree of preparedness of a country for implementing e-governance.<sup>25</sup>

The Global Information Technology Report 2016<sup>26</sup> rated Singapore as the highest-placed country in the world when it comes to networked readiness. Finland, which topped the ranking in 2014, remains in second place for a second year in a row, followed by Sweden (third), Norway (fourth) and the United States, which moved up two places, fifth. Making up the rest of the top 10 are the Netherlands, Switzerland, the United Kingdom, Luxembourg and Japan.

The Report also sees several sub-Saharan African countries among the top upward movers, including South Africa (65th, up 10), Ethiopia (120th, up 10) and Côte d'Ivoire (106th, up 9). Leadership, in terms of digital adoption, is coming from different groups of stakeholders. While efforts are very much government-driven in Ethiopia and Côte d'Ivoire, the business sector is providing the most momentum in South Africa. The largest barriers to tackle for Côte d'Ivoire will be infrastructure and affordability; reversing the trend of a deteriorating business and innovation environment for South Africa; and boosting individual usage and skills for Ethiopia.

“The digital economy is an essential part of the architecture of the Fourth Industrial Revolution. In order for digital technology to continue contributing economic and social impact, societies need to anticipate its effects on markets and to ensure a fair deal for workers in digitized market environments. New models of governance will be key in this,” said Richard Samans, Head of the Centre for the Global Agenda, Member of the Managing Board, World Economic Forum, Geneva.

The southern part of Africa with South Africa, Botswana and Mauritius as examples, is perhaps relatively better prepared for the global networked economy than other parts of Africa. As can be seen in the Report, Africa scored low on most of the indicators, with the exception of factors relating to “Culture,

<sup>25</sup> For more information, see IGI GLOBAL <http://www.igi-global.com/dictionary/e-readiness/8895>

<sup>26</sup> World Economic Forum, <https://reports.weforum.org/global-information-technology-report-2016/press-releases/>

understanding, effectiveness”, which includes English language usage and population demographics. African countries tend to have a large portion of their population aged under 65 years, which is a positive indication for vibrancy and growth.

African governments have realized or are beginning to realize the need to formulate policies that could help them overcome their apparent backwardness and connect to the global network economy. For example, many African governments now operate within the directives of The World Summit on the Information Society (WSIS 2004) and similar world bodies (see G8 DOT Force 2001; United Nations ICT Task Force 2004) as they set about implementing key recommendations. Examples include the formulation of national IT policies, formation of regional partnerships and emergence of an enabling economic climate on the continent, including deregulation and liberalization policies.

What about Rwanda, within this context?

The rise of Rwanda’s economy is gradually attracting investors’ attention. According to the World Bank, it is now easier, faster and less expensive to operate a business in Rwanda than in most other African countries. In this year’s “Ease of Doing Business” rankings, by which the World Bank gauges the intricacies of running a company in different countries, Rwanda comes in at 58 out of 183 nations surveyed, up from 143 in 2009. In Africa only Mauritius, South Africa, Botswana and Tunisia fared better.

The World Bank says that a high ranking indicates that a country has adopted laws favourable to starting and operating a company, in areas such as accessing credit, registering property transfers, paying taxes and enforcing contracts. In 2005 an entrepreneur had to go through nine procedures to start a business in Rwanda, at a cost of 223% of per-capita income. Today, observes the Bank, it takes only two procedures in three days, at a cost of 8.9%!

Government policies to encourage the technology and communications sectors are also stimulating entrepreneurial creativity and growth across the economy. It is perhaps the government’s determined plans to transform Rwanda into a regional high-tech hub —or “Singapore of Africa” — that has most captivated many people. With that goal the government initiated the five-year “National Information and Communication Technology (ICT) Plans”. The first plan, from 2000 to 2005, focused on creating policies favourable to ICT initiatives. The second, from 2006 to 2010, concentrated on building the ICT backbone, including laying fibre-optic cables. The third, scheduled to run from 2011 to 2015, speeds up the introduction of services to exploit new technology.<sup>27</sup>

**Activity:**

Take some minutes to reflect on how African e-readiness could be improved through KSP

<sup>27</sup> Masimba Tafirenyika, From Africa Renewal: April 2011, <http://www.un.org/africarenewal/magazine/april-2011/information-technology-super-charging-rwandas-economy>

## 6. RWANDA AS A KNOWLEDGE SOCIETY

Rwanda is a densely populated and landlocked country in East Africa, covering 26,000 square kilometres (Government of Rwanda, 2014). The population amounts to more than 10 million people with a growth rate of 2.6% p.a., one of the highest in Africa (National Institute of Statistics of Rwanda, 2012). Of the total Rwandan population, 85% lives in rural areas. The three official languages are Kinyarwanda, English and French. The main economic sectors are tourism, mining and agriculture. Its chief export products are tea and coffee.<sup>28</sup>

The gross domestic product per capita in Rwanda was last recorded at US\$ 689.69 in 2015. Per capita GDP in Rwanda is equivalent to 5% of the world's average. GDP per capita in Rwanda averaged \$383.96 from 1960 until 2015, reaching an all-time high of \$689.69 in 2015 and a record low of \$202.43 in 1994.<sup>29</sup>

In Rwanda, as in many developing countries, SMEs are the engine of economic growth. The SME sector, including formal and informal businesses, encompasses 98% of companies and accounts for 41% of all private sector employment (Ministry of Trade and Industry, 2010). Owing to this economic significance, the Government of Rwanda has implemented strategies to improve the growth and competitiveness of SMEs at the top of its agenda, making the environment for ICT diffusion mostly auspicious. A number of large organizations have invested in installing computer systems to exploit the existing ICT infrastructure and thus expand their business. However, SMEs so far – likely due to lack of awareness of the ICT-based business potential – do not use ICT extensively yet, with the exception of mobile phones for business calls.<sup>30</sup>

In order to build a knowledge-based economy, citizens require new skills, including the use of ICT as well as an ability to engage in lifelong learning. Education, and more particularly use of ICT in education, is the main channel to achieve this aim. ICT is considered a powerful tool that will catalyse the country's economic development process.

Rwanda has experienced significant progress in the deployment of ICT infrastructures that connect the country to global networks. The existing national fibre-optic backbone network connects Rwanda to international sea cables and thus provides for affordable access to Internet across the country. Legal and regulatory tools have been developed following governmental initiatives to disseminate ICT and e-commerce-related technology among large and small companies. Focusing on SMEs, Rwanda has received a variety of governmental and non-governmental initiatives to foster ICT and e-commerce usage. However, SMEs still face limitations especially with regard to system standardization and payment solutions (NICI 2015<sup>31</sup>).

<sup>28</sup> Uwamiyara, M., Cremer, S., Loebbecke, C.: "ICT for Economic Development in Rwanda: Fostering E-Commerce Adoption in Tourism SMEs", Proceedings of SIG GlobDev Eighth Annual Workshop, Fort Worth, Texas, USA, December 13, 2015, available at: [http://www.globdev.org/files/SigGlobDev\\_2015\\_paper\\_3\\_0.pdf](http://www.globdev.org/files/SigGlobDev_2015_paper_3_0.pdf)

<sup>29</sup> Trading Economics, available at: <http://www.tradingeconomics.com/rwanda/gdp-per-capita>

<sup>30</sup> Uwamiyara, M., Cremer, S., Loebbecke, C.: "ICT for Economic Development in Rwanda: Fostering E-Commerce Adoption in Tourism SMEs", Proceedings of SIG GlobDev Eighth Annual Workshop, Fort Worth, Texas, USA, December 13, 2015, available at: [http://www.globdev.org/files/SigGlobDev\\_2015\\_paper\\_3\\_0.pdf](http://www.globdev.org/files/SigGlobDev_2015_paper_3_0.pdf)

<sup>31</sup> NICI (2015), Rwanda, available [www.rura.rw/fileadmin/docs/NICI\\_III\\_Final\\_Document.pdf](http://www.rura.rw/fileadmin/docs/NICI_III_Final_Document.pdf)

Unlike most African nations, Rwanda has limited natural resources. This limitation presents an opportunity for Rwanda to take an approach to development that differs from that of its neighbours – an approach where ICT forms the cornerstone of its plans to fundamentally transform its economy. At the beginning of the decade, Rwanda drew up a blueprint – dubbed Vision 2020 – for how to achieve this goal. Adopted in 2000, Vision 2020 outlines several initiatives, programmes, and strategies for transforming Rwanda into a middle-income country and transitioning its agrarian economy into an information-rich, knowledge-based one by 2020.

In 2016, Rwanda had 8.7% of Internet penetration, occupying 154th place in the world, after Iraq (9.2%) and Djibouti (9.5%) .<sup>33</sup>

Internet Live Stats<sup>33</sup> provides more optimistic information:

**Internet Users in Rwanda (2016\*)**

Rwanda Internet Users: 1,478,216

Share of Rwanda Population: 12.4 % (penetration)

Total Population: 11,882,766

Share of World Internet Users: 0 %

Internet Users in the World: 3,424,971,237

Alliance for Affordable Internet (A4I) – an international industry organization that promotes increased broadband access – analysed 52 developing and emerging countries in Africa and Latin America. In 2016, the report comments on two factors that lock out citizens from Internet access, namely the high cost of smartphones and low income. These two factors apply to Rwanda as much as they do to other countries in the report.

**Figure 8: Rwanda’s National Backbone Project** <sup>34</sup>



<sup>32</sup> Internet Society Report, available at [http://www.internetsociety.org/map/global-internet-report/?gclid=CjwKEAajwqZ7GBRC1srKSv9TV\\_iwSJADKTjaDLsYP5zz0FXsbW8lbb2kwHuSLSKw-gV29zhTkyPcX6hoC8a7w\\_wcB#global-internet-penetration](http://www.internetsociety.org/map/global-internet-report/?gclid=CjwKEAajwqZ7GBRC1srKSv9TV_iwSJADKTjaDLsYP5zz0FXsbW8lbb2kwHuSLSKw-gV29zhTkyPcX6hoC8a7w_wcB#global-internet-penetration)

<sup>33</sup> See <http://www.internetlivestats.com/internet-users/rwanda/>

<sup>34</sup> For more information, see [https://www.google.com.ar/search?q=rwanda+fiber+optic+network&safe=active&espv=2&source=lnms&tbn=isch&sa=X&ved=0ahUKEwi03-XAhOvSAhUHHJAKHY4bDOYQ\\_AUIBigB&biw=1920&bih=901#imgrc=4WfR3T6vo6essM](https://www.google.com.ar/search?q=rwanda+fiber+optic+network&safe=active&espv=2&source=lnms&tbn=isch&sa=X&ved=0ahUKEwi03-XAhOvSAhUHHJAKHY4bDOYQ_AUIBigB&biw=1920&bih=901#imgrc=4WfR3T6vo6essM)

The total mobile subscriber base is high: 8,807,170 as of March 2016. Nevertheless, few people in Rwanda have smart devices and many others' incomes are too low to afford Internet access. According to data from Rwanda Utilities Regulatory Authority (RURA), only 665,684 had smartphones in the third quarter of 2015, while Internet penetration was 33 per cent. The report recommends the reduction of the cost of mobile phones and ICT devices. "Governments must work to reform tax and patent regimes so that ICT device costs can come down; they will also need to incentivize the private sector to develop high-quality, low-cost smartphones."

While international smartphone traders such as Konka Group and Tecno Mobile have entered the local market to sell relatively cheap smart devices, it is still not easy for an ordinary citizen to own an Internet-enabled device. For instance, the cheapest smartphone at Tecno Mobile, that is the Tecno Y3 Smart, costs Rwf41,903 — an amount not many ordinary citizens can afford. With a per capita income at slightly over \$700, many Rwandan subscribers would find such devices luxurious.

In March 2015, the government launched an initiative to allow university students to own laptops through loans. Bank of Kigali partnered with MTN and tech companies to implement the project known as "Viziyo". The initiative aims to increase the use of smart devices and accelerate broadband penetration.

Students get a laptop on loan valued at Rwf240,000 and a modem with a one-year Internet connection. Though this initiative is expected to bring more people online, it will require increased participation by many device sellers and banks. Emmanuel Dusenge, who is in charge of infrastructure at the Ministry of Youth and ICT, told Rwanda Today that they are in talks with other banks and phone dealers to take part in the Viziyo programme.

## 7. KNOWLEDGE SOCIETY POLICIES IN RWANDA

### 7.1 The National Information and Communication Infrastructure Programme (NICI)

ICT Deployment in Rwanda has a target to transform it into a middle-income country and transition its agrarian economy to an information-rich, knowledge-based one by 2020.

In 2000, the Government of Rwanda adopted and implemented the ICT for Development policy usually known as National Information and Communication Infrastructure (NICI) Programme.<sup>35</sup> The key objectives of this programme are to transform the country into an IT-literate nation, promote and encourage the deployment and utilization of ICT in each sector, improve delivery of private and public services, and improve ICT infrastructure in order to make Rwanda a regional ICT hub (NICI 2005, 2010, 2015).

The NICI is divided into four stages, to be implemented within the 20-year time-frame of Rwanda's "Vision 2020":

- **NICI I**, lasting from 2001 to 2005, focused on the liberalization of the telecommunication industry and led to the licensing of private telecom companies and Internet Service Providers (ISPs) to operate within the country.
- **NICI II**, targeting 2006 to 2010, focused on deploying an ICT infrastructure throughout Rwanda. In 2010, the National Backbone Network Project led to a 3,000 km fibre-optic backbone network. Kigali Metropolitan and Wireless Broadband Networks, the National Data Centre and a Digital Broadcasting Network were launched.
- **NICI III**, scheduled to last from 2011 to 2015, focused on developing skills and knowledge.
- **NICI IV**, planned for 2016-2020, aims at consolidating previous results towards the overall goal of Rwanda's Vision 2020, that is to turn Rwanda into an "a middle-income, information-rich knowledge-based society and economy by modernizing its key sectors using ICT" (Government of Rwanda, 2000). Rwanda analyses its success using three key ICT performance indicators, Availability of Mobile and Fixed Telephone Services, Internet Penetration, and Broadcasting Availability.

#### Activity:

Read the National Information and Communication Infrastructure (NICI) Programme. To what extent does it cover all the necessary issues? What new proposals would you add to this plan?

<sup>35</sup> ICT for Economic Development in Rwanda Proceedings of SIG GlobDev Eighth Annual Workshop, Fort Worth, Texas, USA, December 13, 2015

**Activity:**

Take some time to read Vision 2020 and reflect on it. Do you think it should be updated? If so, in which areas?

Consider that the NICI Plan was built in 2010, and that by 2017 there have been considerable technological, economic and social changes. How could the NICI Plan be updated? Please take some time to fill the blank spaces with your own perceptions and proposals in:

**Action Box 6:**

Improving the NICI Programme	
Areas to be updated	
New issues to be covered	
New necessary infrastructure	
New stakeholders to be added	
New geographic priority areas	
New beneficiaries	
New actions to be taken	
Any other proposals	

**7.2 E-Readiness**

- **Availability of Mobile and Fixed Telephone Services.** Rwanda’s mobile telephone subscriber numbers grew from 6.4 million as of June 2013 to 7.2 million as of June 2014, increasing mobile penetration from 61% to 68% (Rwanda Utilities Regulatory Authority, 2014). This growth has been due mainly to increased competition on the market, which resulted in a continuous decrease in retail mobile telephone service tariffs coupled with a number of promotional packages and daily packs offered by licensed telecom operators.

Rwanda has only one fixed telephone service provider with 47,000 subscriptions (0.44% penetration rate). In August 2012, Rwanda inaugurated its “International Gateway Traffic Verification System” , which enables the monitoring and management of national and international interconnections of telecommunication / ICT networks.

<sup>36</sup> ICT for Economic Development in Rwanda Proceedings of SIG GlobDev Eighth Annual Workshop, Fort Worth, Texas, USA, December 13, 2015

With the system, the regulator (RURA) is able to:

- (1) control national and international traffic calls,
  - (2) monitor international gateways,
  - (3) conduct accurate billing and collection of taxes and contributions,
  - (4) conduct real-time monitoring of the quality of service indicators for international and national communication traffic, and
  - (5) detect and manage telecommunications fraud.
- **Internet Penetration.** Rwanda has nine Internet Service Providers (ISPs) and one Network Service Provider (wholesaler). In 2014, the country counted 3.7 million Internet users (36% penetration rate). Of those, 55% use the Internet with mobile devices, 32% in cybercafés and telecentres, 10% in their institutions, and 3% at home via a fixed line (Rwanda Utilities Regulatory Authority 2014).
  - **Broadcasting Availability.** Rwanda has 15 digital TV broadcasting stations and 30 FM radio broadcasters. In July 2015, all analog transmitters were switched off, migrating Rwanda completely towards digital TV. In terms of ongoing ICT and e-commerce projects, the implementation of the National Information and Communication Infrastructure programme (NICI programme) has had positive effects across several economic sectors and in public administration.

#### ICT in Education

The Government of Rwanda has initiated and implemented numerous ICT projects in education. The three most popular projects are: One Laptop per Child (OLPC), Rwanda Research and Education Network (RwEdNet) and Knowledge Lab (kLab).

1. One Laptop Per Child (OLPC) aims to enhance education by introducing ICT to primary schools. In particular, the project targets the development of pupils' computer skills. With an initial target to deliver one million XO laptops before 2017 (OLPC Rwanda Blog 2012), only 200,000 XO Laptops covering 407 primary schools had been delivered by December 2013 (Ministry of Youth and ICT, 2013). The relatively high production cost of \$181 (more than half of the yearly average income of Rwandans) was identified as one of the major problems.
2. The Rwanda Research and Education Network (RwEdNet) aims to interconnect Rwanda's institutions of higher education with global education system and research networks. A major challenge has been the lack of clear ICT strategies within RwEdNet members.
3. The Knowledge Lab (kLab), launched with the help of both Korean International Cooperation Agency (KOICA) and Rwanda Development Board (RDB), provides them with free Wi-Fi, workspace and mentoring.<sup>38</sup>

#### ICT in Health

We define e-Health as the use of ICT to enable, support and deliver health services to patients and populations. Investment in ICT serves to amplify the impact of existing resources by improving accuracy, extending services to underserved areas, and cutting waste and redundancy. ICT could also

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<sup>38</sup> ICT for Economic Development in Rwanda Proceedings of SIG GlobDev Eighth Annual Workshop, Fort Worth, Texas, USA, 13 December 2015.

be used to address the main obstacles to providing affordable quality healthcare in African countries.

A central project is TRACnet. Replacing a largely paper-based system since 2005, the TRACnet system is designed to collect, store, display and disseminate medical information, as well as to manage drug distribution and patient information related to the care and treatment of HIV/AIDS (Cishahayo, 2011). Results from blood tests can be obtained much faster. HIV/AIDS physicians can monitor Anti-Retroviral (ARV) therapy drug stocks in real time and hospitals can send urgent requests to the central retroviral drug stocks in case of stock shortage. To tackle the insufficient number of physicians in the country, the plan has been to build five telemedicine centres to allow physicians and medical students to exchange medical information for personal training and career development, and facilitate physicians' interaction with other medical specialists around the world.

By mid-2015, three centres had been established. However, the of lack broadband connections and qualified personnel, led to more or less abandoning of the ICT systems deployed in the centres (Nchise et al., 2012<sup>36</sup>).

### **ICT in Agriculture**

The “eSoko” project, implemented in 2010, aims at transforming Rwandan agribusiness. Esoko, an information and communication service for agricultural markets in Africa, is a response to the explosive growth of cellular services across the continent. The company provides advice to farmers (market prices, weather forecasts and growing tips) to help them increase yields and profits as well as solutions for businesses (marketing products, monitoring activities and sourcing goods) to help them connect with farmers. The technology platform itself includes automatic and personalized SMS alerts, buy and sell offers, bulk SMS messaging, SMS polling, Android (operating system) surveys and more.

A private initiative based in Accra, Ghana, Esoko was built and is supported by a team of local developers and consulting staff. In addition to the technology, Esoko provides extensive deployment support, strategic planning and field training to clients.

In short, using mobile and Internet networks, the system allows local farmers and traders to access information related to the prices of agricultural products and to provide statistics to support planning. However, the adoption of the system suffers from a high degree of illiteracy among farmers and traders in Rwanda.

### **ICT in Governance**

The current national ID and driving licence project aims to launch a register of inhabitants and subsequently issue a secure digital national identity card and digital driving permit. Already 95% of the Rwandan population has acquired a national digital identity card. A newly introduced smart card (e-ID) serves as travel document within the East Africa Community; it combines the data from the current ID card, driving licence and passport. The e-ID also stores biometric data such as digital picture, electronic fingerprint and signature and enables the holder to carry just one card for several services.

<sup>36</sup> See Abinwi Nchise, Richard Boateng, Victor Mbarika, Eugene Saiba, Oryema Johnson, The challenge of taking baby steps—Preliminary insights into telemedicine adoption in Rwanda, *Journal Health Policy and Technology*, Elsevier, 2012/12/31, available at: [http://www.healthpolicyandtechnology.org/article/S2211-8837\(12\)00079-2/abstract](http://www.healthpolicyandtechnology.org/article/S2211-8837(12)00079-2/abstract)

In 2010, more than 80 government institutions were connected to and via the system – enhancing transparency and reducing corruption (Ministry of Finance and Economic Planning, 2011). In 2013, the Government of Rwanda introduced the document tracking and workflow management system “e-Mboni”, which is installed in 55 government institutions and on which 4,000 government employees have been trained. The idea is to register all incoming and outgoing mail and documents and to ease tracking and long-term storage of the documents through streamlined and automated processes.

Regardless of significant progress along ICT KPIs and at some island system implementations, many projects were less successful than anticipated. Only 11% of the projects met their goal in due time due to

- (1) lacking qualified human resources,
- (2) insufficient electric power,
- (3) insufficient financial resources,
- (4) high communication cost in comparison to neighbouring countries,
- (5) lack of awareness about ICT and its related benefits,
- (6) high rate of illiteracy and
- (7) insufficient international bandwidth.

For example, in 2012, the Rwanda Tour and Travel Association, in collaboration with the Rwanda Development Board, launched a tourism portal in order to diffuse Rwanda-related tourism information and facilitate online transactions within the tourism industry; however its adoption remains behind schedule compared to other government initiatives and ICT roll-outs in other sectors.

Among the challenges facing those who seek to apply IT to governance in developing countries is the reluctance of civil servants to change. ICT changes the way things are done, and in many cases this might mean less power, influence or money for those in public service who are involved in some of the old non-digital processes. Therefore, transformation in governmental organizations is not easy and we must make sure that political and cultural barriers are recognized and taken care of.

Other concerns include the digital divide (making sure everyone can have access to government services) and privacy and security (providing mechanisms to recognize the identity of individuals and organizations online).

**Example:** Residents of Gasabo District have commended government efforts to ease service delivery through the introduction of an e-Government portal. The residents had the opportunity to speak to officials from the Ministry of Youth and ICT together with Rwanda Online, and the United Nations team in charge of e-Government and technology management at the conclusion of a week-long campaign, dubbed “e-Government Week”. The week concluded with a field tour in the Gasabo District sectors of Jali, Kimihurura and Bumbogo. The officials were briefed on how the e-Government portal has contributed to service delivery.<sup>39</sup>

<sup>39</sup> Source: All Africa, by Julius Bizimungu, <http://allafrica.com/stories/201602220655.html>, Monday, February 22, 2016

Laurent Turimumahoro, a resident, said the portal has reduced the time taken to get particular services they used to walk long distances to get. “Some of us are already aware of these services, and we have started using them; things are changing so that we no longer queue to get services. When you are registered to MTN Mobile Money or Tigo Cash, for instance, all you need is to be aware of how to use your phone and immediately get the service within a few minutes,” he said.

“The money and time I used to spend to get services previously has reduced, I only come here at the sector to pick the records. However, there’s a lot that still needs to be done so that all people get to understand more about how to use these new ways of requesting services.” Florence Murorunkwere, another resident from Jali Sector, said she had challenges before but now believes things have been resolved.

“I used to travel a distance of 12 kilometres to the sector offices where it would sometimes take three days to have service delivery. This time our local leaders are helping to ask for these services within the shortest time possible,” she said.

## Developing a local IT Industry

Rwanda has huge growth prospects for developing world-class Information Technology (IT) industry and services so as to contribute substantially to her economic growth.

Action lines:

- Promote the development of the hardware and software industry, industrial production and assembly, and software and applications development.
- Support the development of local capacity for the manufacturing of ICT products, creating software applications, as well as creating innovative services for local and export markets.
- Partner with the private sector in devising innovative and productive ways of establishing a competitive local ICT industry, to guarantee Rwanda’s effective participation in the global economy.
- To promote the use of Information Technology Enabled Services (ITES) to support Business Process Outsourcing (BPO) as a key intervention for job creation; ITES/BPO is an outsourcing model that uses information technology (IT), typically over the Internet, in the delivery of outsourced processes such as data entry, customer support and translation.
- Design and implementation of ICT research and innovation activities. Set up ICT parks to support research and development as well as innovation.

## Legal and Regulatory Framework

The category of laws and regulations related to the digital world is called cyber-legislation. Laws are needed to bring order to the telecommunications market, to protect citizens’ rights in the new media, to conduct online commerce, to stimulate digital content development, for consumer protection, telework, privacy and digital signatures, among other things. Most countries have existing national legislation for most of these areas, which can be more or less easily adapted, updated and/or adjusted for the digital world, but providing a proper legal environment to protect the rights of businesses and individuals is critical for the development of a knowledge society.

Rwanda has developed criminal legislation. Specific legislation on cybercrime has been enacted through the following instruments:<sup>40</sup>

- Penal Code -Law on Electronic Messages, Signatures and Transactions
- Draft ICT bill

Specific legislation and regulations related to cybersecurity have been enacted through the following:

- National Standards for Cyber Security

Rwanda has an officially recognized National Computer Incident Response Team (CIRT)(Rw-CSIRT). Rwanda developed an Information Security Framework referred to as Government Security Architecture. This architecture provides information security policies, procedures and guidelines for the public and private sector.

**CERTIFICATION:** Rwanda does not have any officially approved national (and sector specific) cybersecurity frameworks for the certification and accreditation of national agencies and public sector professionals. However a draft national policy has been developed and submitted for cabinet approval. This allows the establishment of the organization in charge of cybersecurity, which will perform certification and accreditation of national agencies and public sector professionals.

**POLICY:** Rwanda does not yet have an officially recognized national cybersecurity policy. However there is a draft National Cyber Security Policy. This policy defines priority areas in the field of cybersecurity. It has been submitted to cabinet for approval and further dissemination. The Specialized Cyber Security Division in Rwanda Development Board (RDB) is the officially recognized agency responsible for implementing a national cybersecurity strategy, policy and roadmap.

### Science, Technology and ICT

According to Vision 2020<sup>41</sup>, Science, Technology and ICT, Rwanda will continue to invest in developing suitable highly-skilled scientists and technicians to satisfy the needs of the transition to knowledge-based economy. A knowledge-based economy will require innovative products that can be competitive in regional and global markets. Having laid the foundations for ICT to take-off in the country through the laying of the fibre optic cable network, Rwandans have a whole new world of opportunities to take advantage of.

More noteworthy, the government of Rwanda will encourage the use of ICT as a tool for self-employment, innovation and job creation. Policies to inspire development of smart applications that meet economic needs and develop economic potential will be promoted among young people. ICT as a tool for improving service delivery in both the private and public sector will be emphasized.

<sup>40</sup> See [http://www.itu.int/en/ITU-D/Cybersecurity/Documents/Country\\_Profiles/Rwanda.pdf](http://www.itu.int/en/ITU-D/Cybersecurity/Documents/Country_Profiles/Rwanda.pdf)

<sup>41</sup> Rwanda Vision 2020, [http://www.minecofn.gov.rw/fileadmin/templates/documents/NDPR/Vision\\_2020\\_.pdf](http://www.minecofn.gov.rw/fileadmin/templates/documents/NDPR/Vision_2020_.pdf)

**Activity:**

**Take some minutes to reflect:** Which governmental agency or agencies should be in charge of building, implementing and/or updating a KSP in Rwanda and why?

**Vision 2020**

In order to transform Rwanda into a knowledge-based economy, the government integrated ICT into its Vision 2020 to enable it to leapfrog the key stages of industrialization. The aim was to transform the agro-based economy into a service-oriented, information-rich, and knowledge-based one that is globally competitive. Rwanda's unique experience is driven by the strong partnership among the regulatory, policy, and implementing bodies, which are all under the charge of the Ministry of Youth and ICT. The national ICT strategy and plan—commonly known as the National Information Communication Infrastructure programme (NICI programme)—was adopted by Rwanda in 2000, under the auspices of the United Nations Economic Commission for Africa, as a holistic approach to using ICT for development. Each of the four five-year phases (NICI spans 20 years in total) characterizes this strategy and is aligned with the country's overall development goals and vision.

**Example:** Tel'imbere, the Rwandan Village Phone Project

The Rwandan Village Phone Project, introduced in Rwanda in April 2005 and officially launched in June 2006 in Bugesera, a district of the Eastern Province, is based on the Grameen Village Phone programme introduced in Bangladesh in 1999. That programme is one of the mobile phone's major success stories. The Rwandan VP programme, known as "Tel'imbere", operates throughout the country. "Tel'imbere" is the Kinyarwanda word for "telephone forwards". The project is a joint venture between the Grameen Foundation, MTN Rwanda and three indigenous microfinance institutions – Vision Finance, Urwego and Care Later, other local microfinance institutions such as Inkingi, Duterimbere, and UCT partnered with the VP initiators (Grameen Foundation 2009). According to Rutagengwa (2010), the Operations Manager for Tel'imbere, the number of village phone operators (VPOs) in Rwanda was estimated at 6 253 by the end of February 2010. The increased number of VPOs in Rwanda has contributed to a rise in local telephony access rates from 50% to over 90%, as confirmed by Futch and McIntosh's (2009) research: these researchers found that VPOs in Rwanda receive a loan of US\$ 261 payable over a period of six months, at US\$ 43.50 per month. As the average monthly profit of VPOs in Rwanda is only US\$ 30.50, the VPOs are unable to repay the loans solely from VP revenues. Thus, they have to make the rest of their monthly repayment from other sources of income. On a community level, the VP is helping to transmit news between villages and in arrangements to transport harvests to markets, and establishing communication between the population and the police, thus heightening security (Futch and McIntosh 2009).<sup>42</sup>

To achieve its goals, the Vision 2020 identifies six interwoven pillars, including good governance and an efficient State, skilled human capital, a vibrant private sector, world-class physical infrastructure and modern agriculture and livestock, all geared towards prospering in national, regional and global markets.

<sup>40</sup> Futch, M.D, and McIntosh, C.T. (2009): "Tracking the Introduction of the Village Phone Product in Rwanda", ITJournal, Fall 2009, available at: <http://itidjournal.org/itid/article/viewFile/381/177>

## 8. CONTEXTUALIZATION AND USE OF THE UNESCO KNOWLEDGE SOCIETIES HANDBOOK AT THE COUNTRY LEVEL/RWANDA

The UNESCO Knowledge Societies Handbook<sup>43</sup> (2016) is meant to be used in any UNESCO country. As it states, ICT offers unprecedented opportunities to benefit from the right to freedom of expression, information and communication, as well as to produce knowledge and for individual and social evolution. Accordingly, as stated forcefully in WSIS outcome documents, this translates into an obligation for States and the international community to ensure enjoyment of these opportunities by everyone.

As mentioned before, no country starts from scratch in the construction and development of a knowledge society. The examples quoted in the handbook<sup>44</sup> show that each country has its own entry point. Each local, national and regional reality is unique and needs a knowledge society adjusted to its circumstances. In addition, the world is rapidly changing; consequently, knowledge society policies have to evolve too.

When facing the generation or updating of a knowledge society policy (KSP) it is necessary to bear in mind that it needs planning for the long term: from ten to twenty years. A policy or strategy with key long-term objectives functions as a framework for making decisions and provides a basis for planning. Generating a long-term strategic plan provides the insight needed to keep a government or a multi-stakeholder organization on track by setting goals and measuring achievements. By analysing the information in the long-term plan, policy decision-makers and stakeholders can make necessary changes and set the stage for further planning.

It must be borne in mind that ICT is necessary but insufficient for the societal and political process of developing knowledge societies. The handbook can be useful for all, since its dynamics are intended to allow different countries “to catch the knowledge societies train” at any of the “stations”, to analyse their own context in the mirror provided by the diverse suggested steps, and to contribute to the retrofitting of the strategies.

The methodology presented in the handbook is a model intended to stimulate the actors involved to examine their country’s needs and use their best capabilities and strengths to develop an appropriate policy for it, as well as to ensure its concrete implementation in diverse development contexts.

How can you use this methodology to draft a national roadmap for the contextualization and use of the UNESCO knowledge society handbook at the country level?

<sup>43</sup> See [http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge\\_socities\\_policy\\_handbook.pdf](http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge_socities_policy_handbook.pdf)

<sup>44</sup> If you are interested in more examples, please read the Knowledge Societies Policy Library, IFAP UNESCO – UNU EGOV, 2016, available at: [http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge\\_socities\\_policy\\_library.pdf](http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/knowledge_socities_policy_library.pdf)

You are not expected to develop a full KSP for Rwanda all by yourself. Just go through the handbook and pick up ideas about how it can be applied in Rwanda, then write about them, using the action box. Every government territory is unique, has its own starting point and specific potential and requirements. You may want to reflect on Rwanda's potentials, needs, and goals.

Remember that, as the handbook states, the process framework presented in Chapter 5 for building a KSP is a structured and interrelated checklist of important issues and activities, rather than a rigid or prescriptive plan of operation.

As described below, seven components make up the process framework, the first five of which constitute the policy cycle as relational steps in a logical sequence, whilst the last two are components which are ongoing throughout the duration of the KSP and need to be continuously deployed.

- Component 1 – Contextualizing and diagnosing, typically starts the policy cycle and addresses, first, the territory's global and regional context, second, its specific needs and aspirations, and third, embeds it in the government's policy portfolio.
- Component 2 – Visioning and goal-setting, continues the policy cycle and draws on all relevant stakeholders and interests to create an overarching vision for the medium to longterm of what the KSP should be and how it should be achieved.
- Component 3 – Analysing and designing is the third step of the policy cycle, concerned with establishing governance structures and stakeholder roles, including multi-stakeholder configurations, to support the preparation of detailed policy designs through an analytical process leading to coordinated programmes of policy intervention.
- Component 4 – Implementing, represents the fourth policy cycle component and develops and operates detailed action plans to meet project and programme objectives, ensuring that all inputs and activities are carried out as intended. Appropriate professional and transparent management and coordination tools and techniques are deployed, which also protect legitimate rights, ensure inclusivity and fairly balance competing interests.
- Component 5 – Updating and sustaining, closes the policy cycle and has the objective of updating the whole KSP process and/or individual components of that process, and thereby aims to achieve longer-term sustainability. This takes place both in response to the KSP's implementation experience and how this is monitored and evaluated by Component 6. It also assesses changes in the societal and global environment of the KSP, in particular whether and how to respond to new opportunities or threats and to ensure the KSP remains relevant and sustainable.

Sequential policy components 1 to 5 are divided into three overall policy phases:

- (1) the preparation phase,
- (2) the formulation phase, and
- (3) the implementation and sustaining phase.

Each is punctuated by two or three milestones which can be used to plan and structure the KSP process and ensure that it is on track to meet its objectives.

- Component 6 – Monitoring and evaluation is an ongoing component throughout the whole policy cycle, supporting all others by providing the rationale and tools for the systematic measurement and evaluation of the KSP’s inputs, activities, outputs, outcomes and impacts, as well as maximizing its continued efficiency, effectiveness, utility and sustainability.
- Component 7 – Communication is also an ongoing component throughout the whole policy cycle, linking all others to the wider society and external stakeholders and interests, including the general public as the broader stakeholder base. It involves two-way communication, enabling the KSP to disseminate information and raise awareness, on the one hand, and encouraging public consultation and engagement on the other. Thus, it combines communication, awareness-raising and outreach strategies.

### **Action Box 6:**

1. Write your own ideas about Rwanda’s context regarding e-readiness and KSP. What can you say about the territory’s global and regional context? Which are the country’s specific needs and aspirations? How are they contemplated in governmental policies? Which organizations would you invite to work together on a KSP?
2. Which is your vision?

## 9. RWANDA BY 2040

Let's dream a little. Since we're already quite near 2020, let's travel a little further in time. Let us imagine it is the year 2040 and Rwanda has achieved its Vision and become a middle-income nation in which Rwandans are healthier, educated and generally more prosperous. The Rwanda we'll have by 2040 is united and competitive both regionally and globally. It is already considered "the Singapore of Africa".

Before that, it has become a knowledge society as planned in NICI 2010. Becoming a KS has played a critical part in fulfilling development objectives.

Now let us go back in time and analyse what the situation in 2017 was using a SWOT analysis matrix.



You are already familiar with this method of analysis. You have already used it in ActionBox 3. Keep in mind the focus is Rwanda as a knowledge society, and keep in mind the vision and objectives planned for 2020.

Image Source: [http://en.wikipedia.org/wiki/File:SWOT\\_en.svg](http://en.wikipedia.org/wiki/File:SWOT_en.svg)

Think about the following issues that will successfully take Rwanda to an exciting position in Africa and in the world in 2040:

- **Strengths:** characteristics of Rwanda that give it an advantage over other countries (internal factors of all types). Examples: Capabilities, competitive advantages, resources, assets, population characteristics, geography, economy, innovation, culture, processes, systems, values, legal system.
- **Weaknesses:** characteristics that place the country at a disadvantage relative to others (also internal factors). These are areas that can be improved. Examples: disadvantages, gaps, competitiveness, financial system, vulnerabilities, pressures, reliability, leadership, commitment, politics.
- **Opportunities:** elements that Rwanda could exploit to its advantage in order to become a knowledge society (external factors). These are indications that we can focus our energy on. Example: other countries' vulnerabilities, technological trends, population issues, global and regional influences, adaptability, partnerships, commitment.
- **Threats:** external elements that could slow or hinder Rwanda's development as KS. These are obstacles that we must surpass. Examples: politics, legislation, environment, competition, sustainability, economy, security, debt.

## **FINAL WORDS**

We hope that you have found the handbook useful. It is meant to be a resource to reference when developing policies. It can help you understand which information is relevant/irrelevant for Rwanda and how to adapt it to various contexts. It is also intended to become a reference for the development of different education-sector policies, a source of ideas on innovation, and a fountain of inspiration for the development of knowledge society policies.

This handbook does not cover all the issues about planning KSP; that would require a much larger volume. However, it includes references you can consult, as well as a list of additional reading materials in case you may need to go deeper into specific KSP issues.

## ADDITIONAL READING MATERIAL

- IFAP – UNESCO: Multilingualism in Cyberspace Proceedings of the Ugra Global Expert Meeting (Khanty-Mansiysk, Russian Federation, 4–9 July, 2015), Moscow, 2017, available at [http://www.ifapcom.ru/files/2016/UGRA\\_ENGL\\_BLOK\\_WEB.pdf](http://www.ifapcom.ru/files/2016/UGRA_ENGL_BLOK_WEB.pdf)
- IFAP – UNESCO: Internet and Socio-Cultural Transformations in Information Society Proceedings of the international conference (Yuzhno-Sakhalinsk, Russian Federation, 8–12 September 2013), Moscow, 2015, [http://www.ifapcom.ru/files/2014/sakhalin\\_sb/sakhalin2013\\_eng\\_web.pdf](http://www.ifapcom.ru/files/2014/sakhalin_sb/sakhalin2013_eng_web.pdf)
- IFAP – UNESCO: IFAP. Living Information, Paris, UNESCO, <http://unesdoc.unesco.org/images/0015/001502/150279e.pdf>
- IFAP – UNESCO: keystones to foster inclusive knowledge societies: access to information and knowledge, freedom of expression, privacy and ethics o a global Internet, Paris, UNESCO 2015, <http://www.unesco.org/ulis/cgi-bin/ulis.pl?catno=232563>
- ITUs Research on Legislation in data Privacy, Security and the Prevention of Cybercrime (2006) [http://www.itu.int/dms\\_pub/itu-d/opb/str/D-STR-CRIM-2006-PDF-E.pdf](http://www.itu.int/dms_pub/itu-d/opb/str/D-STR-CRIM-2006-PDF-E.pdf)
- UNESCO recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace. (2003) <http://www.unesco.org/new/en/communication-and-information/about-us/how-we-work/strategy-and-programme/promotion-and-use-of-multilingualism-and-universal-access-to-cyberspace/>
- UNESCO – WSIS (2014): Building inclusive knowledge societies.A review of UNESCO's action in implementing the WSIS outcomes, Paris, available at <http://unesdoc.unesco.org/images/0022/002264/226425e.pdf>
- UNESCO Convention for the Safeguarding of Intangible Cultural Heritage (2003) <http://www.unesco.org/culture/ich/index.php?lg=en&pg=00022>
- UNESCO (2013) “Renewing the Knowledge Societies Vision: Towards Knowledge Societies for Peace and Sustainable Development” <http://en.unesco.org/post2015/sites/post2015/files/UNESCO-Knowledge-Society-Report-Draft--11-February-2013.pdf>