"The Role of Information and Communication Technology ICT) in Enhancing Local Economic Development and Poverty Reduction".

Presented by
Eng. S M Kundishora, B.Sc. (Eng), M.Sc., M.Phil., FZAS, FZIE
Chief Executive Officer, Zimbabwe Academic and Research Network

P.O Box CY 2607, Causeway, Harare, Zimbabwe
Tel.: +263 4 253523, 726859, Mobile +263 11 871 160
e-Mail: sam@zarnet.ac.zw

Abstract

The paper discusses the foundations for establishing a viable and sustainable Information and Communication Technology (ICT) industry and the opportunities it offers against the challenges many African countries face in their concerted efforts to participate fully in the information society and knowledge economy. Key ICT Policy thrusts are discussed focusing on the ICT as a sector, e-government, e-governance and the education and training sectors. It is important to emphasize the need for government to be e-literate in order to competently manage and monitor the ICT sector. It is reaffirmed that ICT is crosscutting and an enabler for growth and development and for maximum benefit, countries must establish the right policy interventions, resource investments, appropriate networks (partnerships) and enabling environment.

Four case studies that assist in mitigating effects of poverty and e-literacy are briefly discussed in order to show the impact of ICTs in agriculture, e-government and rural districts.

1.   BACKGROUND

Concerted efforts by governments, international community, business sector and civil society are necessary to ensure that the activities outlined in the WSIS Geneva Plan of Action are fully implemented. Closer international cooperation and collaboration will help developing countries seize the benefits of ICT and use them to accelerate their economic developments as they work towards achieving the Millennium Development Goals.   The following are ten key strategies contained in the Geneva Action Plan which African Heads of States and Governments agreed to and signed WSIS in December 2003:

1. To connect villages with ICTs and community access points;

2. To connect universities, colleges, secondary schools and primary schools with ICTs;

3. To connect scientific and research centres with ICTs;

4. To connect public libraries, cultural centres, museums, post offices and archives with ICTs;

5. To connect health centres and hospitals with ICTs;

6. To connect all local and central government departments and establish websites and e-mail addresses;

7. To adapt all primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances;

8. To ensure that all of the world's populations have access to television and radio services;

9. To ensure that more than half the world's inhabitants have access to ICTs within their reach; and

10. To encourage the development of content and to put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet.

It was also agreed that nations would operate within their economic strengths as they attend to these action plans aimed at bringing about a global information society.

2.   IMPORTANCE OF ICTs

Definition
<u>Information and Communication Technologies (ICTs)</u>

Several definitions have been given to explain and interpret the acronym ICT and the one given below seems to be the closest:
'ICTs is a generic term referring to <u>technologies</u> that are used for collecting, storing, editing and passing on (communicating) information in various forms.'

The above definition separates distinct fields of ICTs and at the same time links them together so as to operate as an entity.

It is now a fact as evidenced by developments from other countries that ICT as a sector can contribute immensely to the national GDP of a nation and that ICT, acting as an enabler, can result in improved market competitiveness of a nation's products and services. ICTs can impact positively on governance and other sectors of the economy. In turn ICT can effectively assist international economic integration, improve living standards, narrow the digital divide, and improve biodiversity utilisation and management.

The digital divide characterized by highly unequal access to and use of ICT and manifests itself both at the international and domestic levels needs to be addressed by national policy makers. The digital divide can be narrowed and poverty reduction addressed through effective and focused utilisation of ICTs in key sectors such as education, industry and agriculture. The adoption of ICT requires a business environment encouraging open competition, trust and security, interoperability and standardization, and financial resources for ICT. This requires the implementation of sustainable measures to improve access to the Internet and telecommunications infrastructure and increase ICT literacy, as well as development of local Internet-based content. African countries like most developing countries still depend on content developed and managed in the developed world and as a result substantial costs are incurred while trying to access content. One of the causes that discourage access to digital information is culture and language differences. Efforts should be made to make ICTs available in local languages if they are to be demystified, adopted and utilised by locals.

In general, ICT goals in Africa are: to establish an environment that encourages networking of services and applications; promoting e-commerce and trade promotion programmes for goods and services; promoting Internet access to exchange and access digital content; establishing e-government; promoting e-education and on-line services; strengthening network security; building and developing e-society and ICT human resources.

3.   LAYING THE FOUNDATION

ICTs are now exerting considerable pressure on the orthodox structures of the educational systems in several African countries. Many countries in Africa are now advocating for a review of their curricula to facilitate infusion of ICT (ICT literacy) from early stages of education through to tertiary levels. Distance education has been further enhanced with modern ICT systems and structures. A certain level of education and appreciation of ICTs is necessary in order to at least understand and work with ICTs. Structured training programmes must be developed and provided for those who left the education mainstream before the advent of ICTs including those at workplaces and the life-long learners in general. Pragmatic, practical, innovative education systems must constantly be developed and reviewed to address Africa's needs today and in the future in line with technological developments in the ICT sector. Relevant African content must be developed for national, regional and international consumption and Africa must start making direct contributions to the pool of world information resources.

ICT and the Internet have also enhanced linkages between training institutions at national, regional and international levels. Most universities now operate elaborate campus wide area networks and have gateways to other similar institutions facilitating collaboration and exchange of research and development information. Several countries in Africa are collaborating on National Research and Educational Networks with support from partners outside Africa.

Capacity building is important if the society is to accept, adopt and use ICTs. There is need for publicity, debate and above all exposure to ICTs. The ICT policy should adequately provide for capacity building including life-long learning.

Policy Thrust in Capacity Building
1. Provide equitable access to ICTs enabled education and training in all parts of the country, including the disadvantaged communities.
2. Facilitate acquisition of basic, applicable and affordable ICTs equipment.
3. Build ICTs capacity skills.
4. Promote stakeholder participation and partnerships.
5. Promote training in software development, provision of ICTs service and ICTs resources development.
6. Promote e-learning and use of e-learning materials.
7. Standardise ICTs in the education sector.
8. Embed ICTs literacy in the pedagogy of our schools, colleges and universities.

There is need to have a policy that governs ICTs and regulatory mechanism to monitor and manage operations in the ICTs sector. Some of the components to form a firm foundation for ICTs include: assessment of ICT status in all sectors of the society (e-readiness), the challenges encountered in the establishment of an e-society, and above all the will and commitment by leaders to adopt ICTs as enablers for national economic development.

Vision and Mission

There is need to have a Vision and Mission that will provide a rallying point and focus for ICT for the nation at a given period. For Zimbabwe the following became their Vision and Mission statements.

VISION

- To transform Zimbabwe into a knowledge based society by the year 2020.

MISSION

- To accelerate the development and application of ICTs in support of sustainable socio-economic growth and development in Zimbabwe.

4.   GUIDING PRINCIPLES

The development of any Policy takes into consideration what has been done in the subject area before and for Zimbabwe, the following national and international documents reflect science and technology and in some instances refer directly to ICTs. These documents form the foundation and pointers which guide the development of an ICT Policy.

In the case of Zimbabwe, the guiding principles were derived from:-
- Vision 2020
- Science and Technology Policy (2002)
- The National Economic Recovery Programme
- The Nziramasanga Education Commission Report (1999)
- Industrialisation Policy (2004)
- WSIS Declaration of Principles and Plan of Action (2003)
- Zimbabwe Millennium Development Goals (2005)

It is important to note that some of these documents have been adopted in other countries outside Zimbabwe.

5.   POLICY OBJECTIVES

Specific purpose and objectives of the ICT Policy should be enunciated so as to be clear about the policy and its intentions. The policy should be mindful of the need to address economic development, poverty reduction and governance among other areas.

Purpose of ICTs Policy

The purpose is to provide strategic direction and guidance for sustainable national development through the systematic application of ICTs in a country.

This is achieved through the following objectives:

Policy Objectives

- Ensure <u>provision and maintenance</u> of infrastructural facilities necessary for ICTs development, such as reliable supply of electricity, telecommunications and transport.
- Promote and support the systematic, <u>relevant</u> and sustainable development of ICTs.
- Embark on extensive educational and training programmes to provide adequate supply of qualified ICTs personnel and knowledge workers in all sectors.
- Establish structures for effective implementation of ICTs strategies.
- Establish institutional mechanisms and procedures for determining sectoral application priorities; and
- Encourage the development and use of and ensure equitable access to benefits offered by ICTs across gender, youths, the disabled and the elderly.

6.   ICTs CHALLENGES IN AFRICAN COUNTRIES

African countries are now aware of the benefits derived through adoption and use of ICTs but there are many serious challenges which must be addressed and chief among them are:

- Inadequate communications and power infrastructure
- Shortage of ICTs facilities and ICTs skills
- Inadequate institutional arrangements
- Limited financial resources
- Inadequate public private partnership
- Limited data management capacity
- Inadequate horizontal and vertical communication

- Inadequate bandwidth nationally and on the Gateway

Some of the above challenges can be addressed through public-private smart partnerships.

7. MINDSET CHANGE IN GOVERNMENT

In Africa, governments are now faced with the challenge of transformation, a paradigm shift, necessitated by the age of network intelligence. Governments must undergo internal and external transformation in order to move in unison with the private sector and respond swiftly to ICT developments and its dictates. Internally, Governments are called to improve the efficiency and effectiveness of internal functions and processes within government departments and institutions through internetworking while externally, governments are called to be more transparent and give citizens access to government information.

Government should appreciate their overall responsibility of creating a conducive environment that allows for the development of ICTs for national benefits.

e-Government must be customer driven and services oriented, meeting the needs of citizens and improving the quality of life. Ensuring the availability of minimum supply of ICT infrastructure, roads and electricity (including solar and renewable energy) for remote and rural areas should be considered an important part of those strategies. Lowering the cost of PCs for targeted population groups, relaxation of import duties, tax breaks and assurance that investors can regularly repatriate their investment should be incorporated.

Government should understand ICT and their implication to government and society at large. The Policy should unequivocally spell out the role of government.

e-Government: An Overview
e-Government uses ICTs to provide, on-line:
- Convenient access to government information and services.
- Delivery of public services.
- Efficient and effective method of conducting business transactions.

As a Policy, Government should:-
1. Develop an e-Government policy and legal framework.
2. Ensure that every ministry/department develops and manages computerised information systems.

3. Ensure that every Government Ministry and Parastatal has an updated informative and interactive website.
4. Create an e-Government Agency to coordinate and rationalise efforts by government entities working on ICTs.
5. Make e-Government services accessible to all citizens.
6. Provide a systems security framework for e-Government.
7. Build capacity for e-Government.

e-GOVERNANCE
e-Governance includes the use of ICTs in the following areas:

- Participation in the decision making processes by the citizens, e.g. formulation and implementation of economic and social policies,
- Making Government more accountable, transparent and effective,
- Facilitating the electoral processes, and
- Maintenance of law and order.

The following should be reflected at policy level:
1. Promote the principle of Universal Access.
2. Develop on-line projects that provide information on governance at and across all levels of society.
3. Strengthen governance and legal framework that promotes participatory democracy and accountability.

8. ICT SUPPORT TO ECONOMIC DEVELOPMENT AND POVERTY REDUCTION

ICTs provide an opportunity for nations to address the digital divide and reduce poverty while registering economic growth. Developed and some developing nations have seen the emergence of a vibrant ICT sector that significantly contributes towards national gross domestic product (GDP). It is this ICT sector that should be built, in most cases, through public-private partnerships.

8.1 ICT Sector

The ICT sector must be strengthened since it affects operations of all other sectors of the economy.

Policy Thrust to strengthen the ICT sector

1. Develop and improve ICTs infrastructure for all sectors of the economy (communications, electricity and transport).
2. Encourage full utilization of existing communications infrastructure to reduce resource wastage.
3. Implement an integrated and equitable framework for accelerated ICTs development and uptake.
4. Increase bandwidth on the national backbone and international gateway(s) systems to enhance speed and efficiency of operations.
5. Develop supportive and enabling infrastructure to ensure equitable access to ICTs by all citizens including disadvantaged groups and rural communities.
6. Promote local production of ICTs products to ensure relevance of content and use of appropriate technologies that meet international standards.
7. Establish institutional mechanisms to co-ordinate inter-organisational planning, policy-making and implementation of strategies to develop ICTs taking into account the convergence of broadcasting, telecommunications and on-line computer services.
8. Implement measures to develop and retain skilled human resources in the ICTs sector.
9. Rationalise the ICTs tariff structure to make ICTs more affordable and accessible.
10. Introduce and enforce stringent quality of service standards in the provision of ICTs.
11. Create a conducive environment for investment through PPPs in the ICTs sector.
12. Promote local research and development in software and hardware relevant to all sectors of the economy.
13. Promote awareness and use of ICTs.

8.2 CASE STUDIES

Four examples have been selected for discussion and they lie in the sectors of ICT, Government, rural community and agriculture. The case studies show how ICT have been deployed to benefit critical sectors in the society and in two cases how it has empowered and changed people's lives and way of existence.

Case Study – 1 : ZARNet

ZARNet is an institution that now has a wide coverage countrywide and was established to enhance initiatives designed to bring the nation into an information society.

Mandate: The mandate of ZARNet is to promote Information and Communication Technology and to facilitate Internet connectivity to the academic and research institutions, schools, non-governmental organisations (NGOs) and other disadvantaged communities throughout Zimbabwe. ZARNet has now expanded to provide its services to government ministries and institutions. Communities particularly those in the rural areas must be encouraged and educated in the advantages of using e-mail and the Internet and to this end, the Government wishes to see ZARNet provide these services at affordable rates so as to cater for the entire society.

Key Strategies
1. Provide services to communities through Local Government District Offices.
2. Service <u>communities</u> through connectivity to schools, Local Councils,
3. Establish regional Internet access nodes to benefit clients in surrounding areas.
4. Partner with content and other developers of e-based applications (in local languages)
5. Provision of Internet access to benefit small-scale farmers, community business centres and citizens.
6. Enhance information age literacy in Zimbabwe.
7. Provide linkages for information exchange between institutions and sectors in the society.
8. Facilitate, promote and encourage local content development that is accessible and establish links with other content providers.
9. Add value to ZARNet products and services.

ZARNet works with partners who play a role in the provision of its services.

Case Study – 2 : Afrosoft Corporation Limited.

Afrosoft Holdings Limited

Afrosoft Holdings Limited is the largest diversified software development company in Zimbabwe. It is among the largest in Africa offering quality market specific technology solutions, products and services to the financial services, commercial and public sectors. The company is registered in the Great Lakes region as Afrosoft International Limited (AIL) based in Kampala, Uganda.

Among the various software packages developed by Afrosoft is AFROPACK the Local Authority Software System. AFROPACK offers Accounting, Human Resource, Trading, Technical and Administrative packages. Key features of AFROPACK include:

1. **System Functionalities.**

The (Afropack) is made up of the following packages:

   I. **ACCOUNTING PACKAGE which comprises:**
      - Billing Module.
      - Receipting Module.
      - Creditors' Module.
      - Cash Book Module.
      - Fixed Assets Module.
      - General Ledger Module.
      - Accounting Reports.

      *The Accounting Package also has an electronic transaction module which enables clients to pay their bills by either e-mail or cell phone.

   II. **HUMAN RESOURCES PACKAGE.**
      - Payroll Administration Module.
      - Personnel Records Administration Module.
      - Pension Fund Administration Module.
      - Medical Aid Administration Module.
      - Funeral Benefit Administration Module.
      - Stop Order Deductions Module.
      - Human Resources Reports.

   III. **TRADING PACKAGE. {For Council Beer Halls and Bottle Stores.}**
      - Bar coded Sales.
      - Stock Control.
      - Profit and Loss Account.

   IV. **TECHNICAL PACKAGE.**
      - Fleet Management Module.
      - Job Costing Module.
      - G.I.S. Module.
      - Project Management.
      - Repairs and Maintenance Module.
        - Roads and Bridges.
        - Plant and Equipment.
        - Plumbing.
        - Motor Vehicles.

   V. **ADMINISTRATIVE PACKAGE.**
      - General Council Information.
      - File Tracking System.

- Housing Waiting List Management Module.
- Strategic Reports from all the Packages.

The package can easily be adapted for Local Authorities and is now used by several Local Authorities in the country.

Case Study – 3 : Case Study – ICTs in Rural Districts

The National University of Science and Technology (NUST), whose mission includes propagation and extension of scientific and technological knowledge to provide solutions to real life problems, is working with residence of two districts namely Bulilima, and Mangwe inclusive of Plumtree Town, a border post town with limited industrialization despite its strategic location in the South Western part of Zimbabwe.

There is poor access to local newspapers in the rural areas and the local radio, television and mobile telephone networks do not broadcast to the area. Most household receive Botswana and South African radio, television and mobile telephony networks. A few local schools have electricity and have skeletal computing facilities but not enough to share with local community. The need for timely access to information and the ability to share their own information and experience is acute.

Methodology

Communities in the project area were consulted through group discussions and community planning sessions. Local level leadership structures were identified as the most suitable vehicle for designing the information and knowledge management system.

NUST partnered with the W. K. Kellogg Foundation Southern Africa Regional Office to source for required equipment including computers and servers, Internet infrastructure and training of local users. The computers were sourced from Computer AID International UK that supports rural communities to access reconditioned computer equipment.

Local school leavers were drafted in as Knowledge Workers and skills capacitated through training in knowledge management to enhance their ability to compile stories and events taking place within their villages. The skills included word processing, letter writing, writing Memos and Records of Meetings, Reports and Community story writing, email usage, spread sheets operations and data base management internet use, power point, proposal writing, basic web page

management, use of digital cameras and projectors and multi-media presentations.

Project Objectives

- To establish information centres at strategic rural centres to enhance the abilities of communities to access information, manage local level information and disseminate this information to external communities;
- To introduce practical computer courses in rural schools to improve computer literacy of students, teachers and parents;
- To enhance informed decision and policy making by Rural District Councils through computerizing the management of information at district centres.
- To provide linkages with relatives working in neighbouring countries or abroad through the Internet and e-mail.
- Local small-scale farmers have access to information about market prices thus saving on time and travel costs.

Project long term benefits

- e-Literacy level uplifted.
- Employment created especially for the youths
- Rural communities linked to the information highway and contribute to the information society.
- Rural districts management and village leadership empowered in decision making and utilisation of local resources

Operational Structures of the Information Management Systems

LEVEL	STRUCTURE	FUNCTIONS
District	District Information Management Unit	Manage the District database
		Update the District Web site
		Download information from internet into District Newsletter
		Manage Information Workers
		Produce and distribute the District Newsletter
Ward	Ward Information Centre	Management the Ward data base
		Feed into District Data base
		Disseminate information into the Ward
Village	Knowledge Workers	Contribute local stories to Newsletter and Web page
		Disseminate information at local level
		Provide Secretariat support to local level governance (including traditional leaders) and planning structures.

Case Study – 4 : e-Hurudza

A local private sector company developed a software package to support the government's agrarian reform programme

Programme focus:
Electronic Farm Management Software Solution has the following features:

Features:
- Agricultural information for all regions
- Tutorial on how to grow crops specific to your region including land preparation.
- Planting methods and a monitoring programme on when to do what in the lifespan of the crop or livestock.
- <u>ALL</u> input requirements i.e. seed, fertilizers, insecticide/chemicals, manpower, when to plant seed (monitored), expected yield per hectare (irrigation or rainfall).
- A comprehensive farm equipment, tools and inventory management systems is incorporated.

e-Hurudza Programme has equally comprehensive information for livestock.

Resources required
The following are the basic resources required to run e-Hurudza programme.
- A Computer and printer & relevant infrastructure
- e-Literacy (how to operate a PC)
- Internet access optional
- Networking – input suppliers, product market and prices

e-Hurudza really addresses poverty reduction through economic empowerment.

9. USEFUL COMPARISONS

There is need for countries to benchmark their ICT programmes and pay particular attention to the progress made by other developing countries. India and Malaysia are good examples to study.
Several States in India, for instance Kerala State, have embraced e-Government principles and models and have gone down to village levels where villagers through Information Centres have access to communication facilities, information on land, training, payment of bills, local data sources, etc.

10. CONCLUSION

ICTs are enablers for economic growth because of their crosscutting nature thus affecting all sectors. Adoption and proper utilisation of ICTs will lead, among others, to increased yields and quality production of goods and services. ICT industry can be resourced, properly managed and mainstreamed into a significant contributor to GDP.

References

1. **Zimbabwe National ICT Policy** – December 2005

2. **Partnership Framework for ICT Infrastructure development in Africa** 'S M Kundishora at World Congress on ICT for Knowledge Society, Seoul, July 2006'

3. **Instituting an Information Management System in Rural Communities: Twicking a Tiger's tail or Tickling an Elephant? A Case study of the National University of Science and Technology Project in South West Zimbabwe**

   Lindela R. NDLOVU[1], Themba C. KHOMBE[1], Thabo M NYATHI[2]

4. **Afrosoft Corporation Limited –**

5. **e-Hurudza Corporation Limited**

6. **ZARNet –**

7. **Information Kerala Mission – e-Governance with people at the centre**