

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA



**THE NATIONAL INFORMATION AND
COMMUNICATION TECHNOLOGY
POLICY AND STRATEGY**

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WORKING DEFINITIONS

- 1) Agri-Net Means a network of agricultural research centers across the country providing IT based video conferencing services, Internet, etc.
- 2) Broad Casting Means the distribution of information using radio, television, Internet, intranets, and other technologies used in mass communication.
- 3) Digital Divide Means the technological gap between countries or regions that have fully exploited ICT and those that have not.
- 4) Electronic Commerce (E-Commerce) Means business activities involving consumers, manufacturers, suppliers, service providers and intermediaries using computer networks such as the Internet to conduct business.
- 5) Electronic Government (E-Government) Refers to the delivery by Government of services, through the use of information and communication technologies action and transactions that includes Government to consumers, Government to Business and Govern to Government.
- 6) EthERNET Means Ethiopian Education and Research Network, Network of Government Higher Education institutions for sharing research and knowledge transfer among local universities and collaboration with international research organizations to facilitate innovation and keep quality of education.
- 7) Information Based Economy Means a country or region where ICT has turned to be the bases of the economic foundation.
- 8) Information Society Means a society where information and communication technology has been fully exploited and is part of everyday life.
- 9) Information and Communication Technology Means the convergence of technologies and information services in telecommunications, information technology, and broadcasting.

- 10) ICT Parks Means a high ICT industrial zone specially designed to attract local and foreign direct investment.
- 11) Incubator Projects Means ICT projects designed as start-up ventures with the hope of “growing” from a start-up to a self sustaining organization, after initial capital outlay and possible management consultancy.
- 12) Information Technology Embraces the use of computers and office systems technologies for the collection, processing, storing, packaging and dissemination of information.
- 13) Internet Means a seamless and global network of computer systems providing services
- 14) Knowledge Based Economy Means a country or region where ICT is extensively used and the foundation of the economic development is the knowledge of society.
- 15) School-Net Means a network of high schools all over the country providing distance education services (broadcasting classroom content, Internet, etc.)
- 16) Unicode Means an industry standard allowing computers to consistently represent and manipulate text expressed in any of the world’s writing systems.
- 17) Woreda–Net Means a three-tier architecture based government network for use at Federal, Regional, and Woreda levels to provide basic IP services (Web service, VOIP (voice over IP), Directory Service, Messaging and Video Conferencing).

ABBREVIATIONS AND ACRONYMS

- 1) MCIT Ministry of Communication and Information Technology.
- 2) ICT Information and Communication Technology
- 3) NICTC National Information and Communication Technology Council.

CHAPTER ONE

VISION, MISSION, GOAL, OBJECTIVES AND PRINCIPLES

1.1 Introduction

The Ethiopian Government has made the development of ICT one of its strategic priorities. This stems from the recognition that ICT is a key driver and facilitator for transforming Ethiopia's predominantly subsistence-agriculture economy to a knowledge-based economy and information society. ICT will also be fundamental for Ethiopia's aspiration to become a middle-income country.

At present ICT has shown a great progress. Due to high priority given to the sector by the government, and budget allocated for development of modern mobile network, fixed and broadband internet infrastructures and service expansions, remarkable achievements are obtained throughout the nation. The country has shown high improvement in telecommunication and ICT service provision. However, the utilization of ICT in Ethiopia remains low in comparison with regional and global peers. The major indicators are:

- a) The absence of appropriate legal and regulatory frameworks,
- b) Limitations in telecommunications infrastructure and low usage & consumption of broadband internet services,
- c) Lack of organized data and information resources, and poor accessibility to those that exist,
- d) Lack of skilled human resources coupled with low ICT literacy, and
- e) Under developed private sector.

In promoting the leadership and commitment given to the sector as well as investment conditions, the indicated constraints not only present the Government with real challenges, but also opportunities, for accelerated development of ICT in

Ethiopia. Thus, the Government of Ethiopia recognizing the importance of Information and Communication Technology development has adopted this ICT policy and strategy.

The scope of Ethiopia's ICT policy covers knowledge and information as a tool for development & ICT as a sector or industry. Apart from being as enabler of socio-economic development, ICT also supports Ethiopia's on-going process of democratization and good governance. The major areas of ICT application in the area of democratic governance include on-going programs such as civil service reform, justice reform and decentralization. ICT promotes democratic governance by enabling all citizens to participate in the political process as well as have access to global knowledge and information. Thus, the goal of the government is to ensure that all citizens have equal and equitable access to government services and to knowledge and information. Hence, the Government has a commitment to accelerate the development of ICT in order to strengthen the on-going process of sustainable development and poverty reduction as well as good governance and democratic system.

ICT is also a key element in achieving the seventeen UN Sustainable Development Goals (SDGs). Goal 9, and its targets, places an emphasis on the role of technological progress and bridging the digital divide to find lasting solutions for both economic and environmental challenges. This document articulates policy guidelines and describes critical strategic issues for the development of ICT in Ethiopia.

The policy and strategy document is organized into three chapters. The first chapter highlights the status of ICT development in Ethiopia and also expresses the Government's keen interest in the exploitation and application of ICT. In addition the chapter explains the basic principles of the national ICT policy, in terms of ICT vision, mission, goals, objectives and strategies. The second chapter explains the strategic focus of the policy in terms of the ICT infrastructure, human resource development, ICT regulatory & security issues. The final chapter contains the

creation of institutional framework, and the coordination, monitoring and evaluation of the works to be implemented.

1.2 The National Vision

To transform Ethiopia from a country associated with poverty to a middle- income economy and society with deep-rooted participatory democracy and good governance based on the mutual aspirations of its peoples.

1.3 The ICT Vision

Every aspect of Ethiopian life is ICT assisted.

1.4 Mission

To develop, deploy and use information and communication technology to improve the livelihood of every Ethiopian, and optimize its contribution to the development of the country.

1.5 Goal

To vigorously promote the ICT sector and enhance its contribution in political, social and economic transformation to make the country beneficial from the rapid development and progress.

1.6 The Broad Objectives

The objectives of the ICT policy and strategy are as follows:

- a) Build ICT Infrastructure throughout the country and make it accessible with required quality.
- b) Create the necessary skilled human resources required for the proper development and application of ICT and expand the society's basic knowledge and usage of it.
- c) Develop the necessary legal framework for the application of ICT and design and implement appropriate security systems for the prevention of unlawful practices.

- d) Promote the use of ICT for modernizing the civil and public services to enhance its efficiency and effectiveness for service delivery; so as to promote good governance and reduce wastage of resources.
- e) Enhance the use of ICT across the economy for increased productivity and efficiency.
- f) Implement the use of ICT in applications relating to climate change and emergency communications.
- g) Develop and implement plans for the ICT sector for broadband and manufacturing sector.
- h) Create a monitoring system to measure the reliability and quality of ICT infrastructure services made available to the public.
- i) Provide support and facilitate the development of local content and services.
- j) Expand and strengthen the role of the private sector to ensure the rapid development of ICT.

1.7 Principles

The implementation of this policy and strategy will be guided by the following principles:

- a) The government shall provide strategic leadership and facilitate conducive environment for the implementation of the policy.
- b) The goals and objectives of the policy shall be to support and strengthen the general objectives and programs of the country.
- c) Expansion of ICT, other infrastructures and services in Ethiopia shall reinforce the principles of universal access and equitable distribution of ICT.
- d) Unhindered access to ICT by the disabled, women and youth shall be ensured and their capacity to use ICT shall be built.

- e) The government shall actively collaborate with the private sector, civil society, organizations and communities to promote and encourage the development of ICT in the country; and shall initiate and strengthen regional and international cooperation's.

CHAPTER TWO

THE STRATEGIC FOCUS OF ICT POLICY

2.1. Introduction

Ethiopia's ICT policy is one of the fundamental components of the country's socio-economic development goals and objectives. Thus, the focus of the policy will be on the following policy foundation and strategic pillars that are considered as the strategic success factors of ICT development.

2.2 ICT Policy Foundation

Ethiopia's ICT policy is one of the fundamental components of the country's socio-economic development goals and objectives. For underpinning all other aspects of the policy, the following four foundational elements are essential.

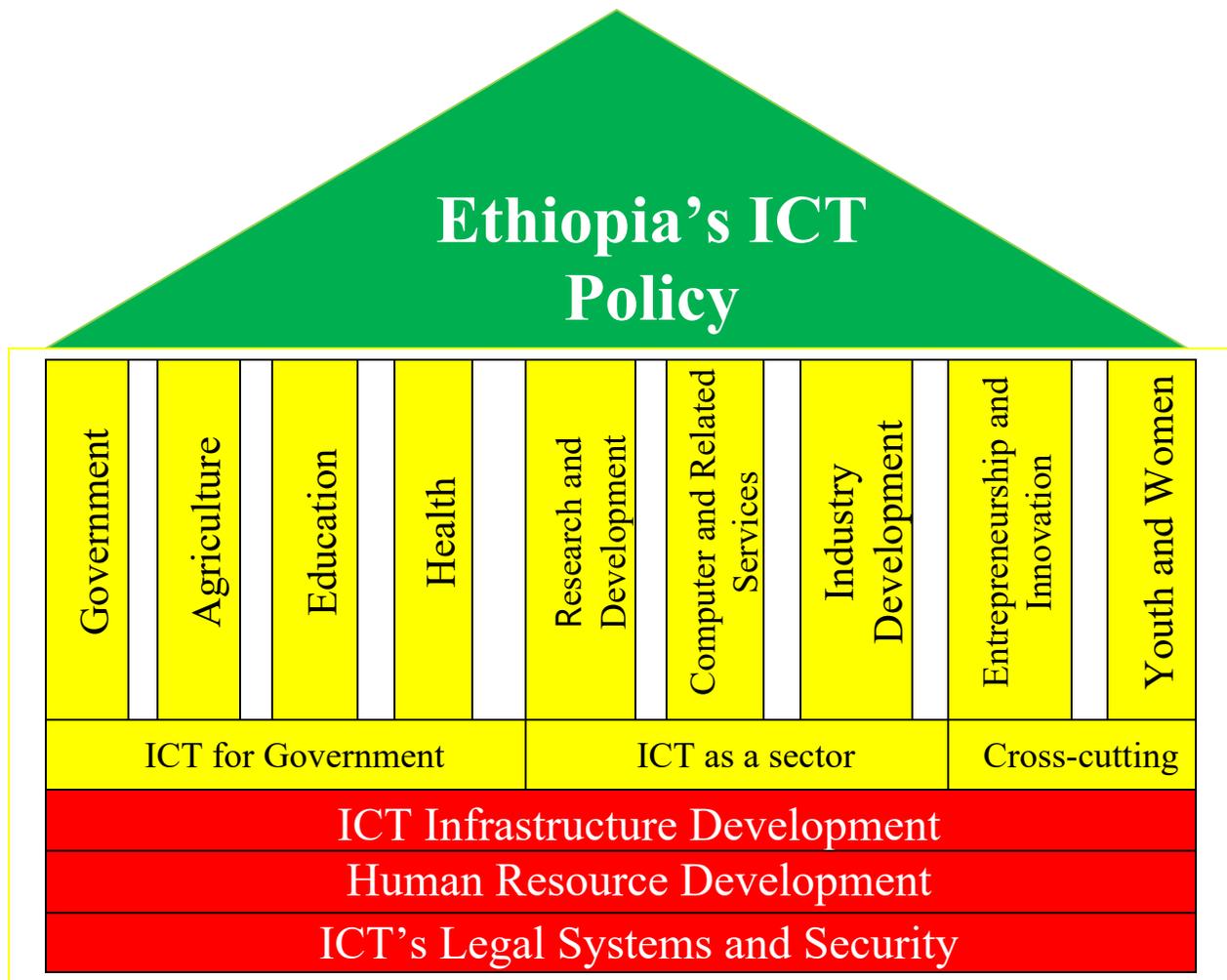
- a) ICT infrastructure development,
- b) Human resource development,
- c) ICT's legal systems and security,
- d) Internet Governance

2.3 ICT Policy Pillars

With the foundation in place, Ethiopia will be in a better position to exploit the potential of ICT in the country, boost ICT-related industries and leverage ICT to usage in the country. The following key sectors, industries and cross cutting issues constitute the pillars of this policy and are intended to highlight and guide the use of ICT in the transformation of Ethiopian economy and society

- a) ICT for governance /E-Government/; Especially:
- ICT in the education sector
 - ICT for improved health
 - ICT for agricultural modernization
- b) ICT industry
- c) ICT for research and development
- d) Computer and related services
- e) Entrepreneurship and innovation
- f) Youth and Women

To implement the ICT policy foundation and pillars identified above, designed goals, objectives as well as strategies against each of the sectors are articulated below.



2.4 ICT Infrastructure

1. Overview

Ethiopia shall equip itself with the requisite and integrated infrastructures such as power and communications networks, which constitute a crucial role for the penetration and development of ICT everywhere. The country needs modern and efficient infrastructure to optimize the benefits provided by ICT.

Thus, in order to attain an integrated development of ICT's and other infrastructures, the Government by pursuing the appropriate strategies, will attempt to meet the goals and objectives listed below.

2. Goal

Develop telecommunications, broadband and communications infrastructure in all regions of the country in view of promoting the development of ICT services and encouraging extensive utilization by the public.

3. Objectives

To avail the ICT Infrastructure, the following objectives are set.

- a) To develop, modernize and expand the country's communications and telecommunications infrastructure and services; aimed at improving both coverage and quality, to provide universal access to knowledge and information.
- b) To establish an information infrastructure that comprises a broadband communications backbone in support of an integrated multi-media services access network; and also to decentralize data warehouses and services to cater to the needs of key sectors of the economy and the delivery of government services.
- c) To promote the effective use of the national radio frequency spectrum.
- d) To ensure that ICT infrastructure and systems are providing services up to standard and being utilized effectively and efficiently.

4. Strategies

To avail the ICT Infrastructure, the following strategies will be implemented.

- a) Develop and implement a guideline for ICT Infrastructure master plan especially for broadband.
- b) Develop, modernize and standardize ICT infrastructure and services.
- c) Develop national and regional high speed networks.
- d) Provide ICT services to users at affordable prices.
- e) Modernize and expand the national electric grid so as to support the expansion of ICT infrastructure.
- f) Research and develop alternative and cost-effective sources of renewable energy for use with ICT equipment and services.

2.5 Human Resource Development

1. Overview

The Government is offering ICT education and training in secondary and tertiary educational institutions with the aim of creating ICT literacy and the basis for the proliferation of ICT professionals in the country.

When the ICT development sector gets strengthening the need for ICT professionals will continue to grow side by side. On top of this, in order to make the community benefit from ICT it will be appropriate to equip it with basic knowledge and awareness of computer and related technology.

Therefore, Ethiopia's ICT policy assigns a strategic role to ICT human resources development along the following objectives and strategies.

2. Goal

Produce knowledgeable and highly skilled ICT human resources at every level for enabling the country to develop and use ICT.

3. Objectives

ICT human resource development has the following objectives.

- a) To strengthen the government and private institutions offering ICT education and training.
- b) To increase the supply of adequately trained ICT professionals.
- c) To develop basic ICT knowledge of the community.

4. Strategies

To strengthen the ICT human resource development the following strategies are derived.

- a) Develop and implement short, medium, and long term ICT human resource development plans.
- b) Promote ICT skills development at all levels of the school system with the aim of increasing the supply and diversity of ICT skills, to eliminate the current critical shortages of personnel and to satisfy the expected future growth requirements.
- c) Encourage and provide support to private sector operatives, both in educational institutions and industrial establishments, so as to enable them introduce technology innovations and strengthen the delivery of ICT training.
- d) Identify and aggressively develop the country's ICT human resource requirements in key areas of the economy through focused ICT education and training.
- e) Re-orient electronics engineering and other ICT-related courseware to accommodate new development in ICT for greater responsiveness to the needs of the industry.
- f) Create an environment conducive to job creation and satisfaction to minimize brain drain.
- g) Facilitate a conducive environment for the expansion of computer education and training in the society.

2.6. ICT's Legal Systems and Security

1. Overview

The exploitation and full-scale application of ICT requires conducive legal systems. This condition refers to the use of ICT as a tool for socio-economic development as well as its promotion as one sector or industry. The government recognizes that the ICT legal systems framework which has been operational in the country cannot cope with the challenges of the fast developing national and global ICT sector.

Moreover, the uncoordinated development of ICT in Ethiopia has inevitably resulted in acquisition and application of varying systems and standards; duplication of efforts and wastage of scarce resources. The government, therefore, recognizes that ICT development will need to be guided by appropriate standards and best practices.

In addition, if proper care and due protection is not given to the application of computers and internet, various damages can transpire. For instance, missing of important data, feeding false and inaccurate data/information can be experienced by individuals, business affairs and public organizations. Thus, in order to use and apply ICT widely, it requires the implementation of the necessary quality standards and the creation of a safe and secure environment. Since information security and standards constitute integral parts of the process of ICT development; the government will give priority to the creation of a safe and secure ICT environment as well as appropriate standards.

Therefore, the government is committed to guide ICT and facilitate its application by implementing the following integral part of the legal systems and security framework.

2. Goal

To safeguard national, institutional and individual security concerns as well as on the basis of technological bonding put in place the institutional legal and regulatory systems to support the development of ICT in the country.

3. ICT's Legal Systems Objectives and Strategies

The ICT's Legal Systems will have the following objectives and strategies.

Objectives

- a) To establish standards and guidelines harmonized at national and regional levels for the deployment and exploitation of ICT throughout the country.
- b) To ensure intellectual property rights protection in ICT
- c) To ensure that ICT policies, laws and regulations accommodate the interests of disadvantaged members of society and building their capacity.
- d) To facilitate domestic and foreign investment for the development of ICT by creating a conducive legal and regulatory environment.
- e) To ensure the implementation of electronics waste management and eco friendly environment is achieved by appropriate legal and regulatory measures.

Strategies

- a) Implement appropriate legal and regulatory frame works.
- b) Formulate legal frameworks pertinent to the development of information resources and services, and integrate them with development policies, strategies and programs.
- c) Review and improve upon existing policies, laws and regulations to facilitate the exploitation and widespread application of ICT.
- d) Remove existing policy, legal and regulatory impediments to the development of ICT.

- e) Develop a legal base for enforcing electronic archive, presentation, utilization and disposal.
- f) Create conducive legal and regulatory environment that facilitates domestic and foreign direct investment in order to facilitate the development of ICT.
- g) Review and improve upon licensing procedures to ensure access to a wide range of ICT services, particularly in the rural areas.
- h) Periodically review the legal and regulatory framework in order to keep abreast of developments within the national and global ICT industry.
- i) Develop ICT and related regulatory frameworks, in order to address ICT's socially undesirable activities.
- j) Implement guidelines and standards for quality control and management in ICT products and service delivery.
- k) Establish and enforce all instruments to handle electronic wastes as per the required standards so that the sector becomes eco friendly.
- l) Protect networks, data and information systems against attacks and unauthorized access and strengthen the National Information Security Policy.
- m) Adopt regional and international standards and best practices in the development of ICT rules, guidelines and regulations.
- n) Establish standards for interconnectivity and interoperability of computer networks.
- o) Introduce character setting and keyboard layout for local language computerization and adopt UNICODE technology.

4. ICT Security Objectives and Strategies

ICT Security will have the following objectives and strategies.

Objectives

- a) To secure and safeguard the national, institutional and individual electronic communications system security.
- b) To enhance user confidence and trust within the public, as well as to protect both data and network integrity.
- c) To prevent, detect and respond to cyber crime and misuse of ICT so as to contribute to the fight against national, regional and international crimes such as prostitution, fraud, organized crime and terrorism.
- d) To address national security implications arising from the widespread application of ICT within the economy and society.
- e) To build overall implementation, crime's prevention and controlling capacity of government bodies in charge of ICT policy implementation and monitoring.

Strategies

- a) Facilitate the enactment of the necessary laws and legislatives instruments to govern and regulate cyber-related activities, intellectual property rights, data protection and security, freedom of access to information, computer and cyber-crime and other cyber-laws to facilitate Ethiopian's unhindered and effective participation in the global information society.
- b) Introduce and enforce appropriate legal measures against misuse of systems and data.
- c) Protect networks, data and information systems against attacks and unauthorized access, and protect the rights of citizens.
- d) Enforce the enforcement of legal measures against misuse of systems and data, negligence or non-compliance to data disaster prevention and recovery procedures.
- e) Equip law enforcement agencies with appropriate ICT infrastructure and services.

- f) Establish and strengthen institutional and human resource capacity of the public and private sectors to ensure network security.
- g) Regularly monitor the network for possible intrusions, virus attacks and illegal activities.
- h) Create data and information security awareness by ICT users.
- i) Keep abreast of developments on current best practices for implementing policies and procedures relating to ICT security.

2.7 Internet Governance

1. Overview

Internet governance is the biggest and challenging aspect of ICT policy and strategy. Internet governance deals with the development and application of principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the global Internet. Because of the growing impact of the internet on every aspect of life, internet policy issues gradually shifted from domestic politics to diplomacy and other internationalized public policy issues. In this regard, decisions made at the global level about internet related issues such as the governance of critical internet resources, social media regulation, internet content management, intellectual property, privacy, law enforcement, and cyber security affect domestic public policy issues and politics.

Even though the issue of internet governance is currently the focus of intense debate on a global scale, the Ethiopian government is not playing its role as it is doing in other international public policy issues. The absence of clearly defined approach towards national and international internet governance discourse further complicates the efforts of the government in advancing and regulating ICT in general and the internet in particular.

Therefore, the government is convinced to prioritize internet governance as part of the ICT policy making discourse and pursue the following goal, objectives and strategies.

2. Goal

To ensure that the international internet governance is addressing the interests of the country and its citizens.

3. Objectives

Internet Governance will have the following objectives.

- a) To make effort that international internet governance will be functional with participation of all the stakeholders.
- b) To make sure that internet governance policy decisions will be based on the equal participations of countries.
- c) Ensure that the international internet governance processes and decisions are made democratically and applicable transparently.
- d) To make sure that the responsibilities of all stakeholders are clear.

4. Strategies

To establish the Internet Governance; the following strategies will be implemented.

- a) Build a clear national internet governance strategy in consistence with the developmental state principles based on the Ethiopia's national interest.
- b) Establish national internet governance forum that could serve as source of evidence based policy issues regarding internet development and regulation.
- c) Create awareness on Internet Governance among policy makers and the general public.

- d) Engage and encourage Ethiopian non-state actors such as professional associations, IT societies, industries, academia, IT Companies and individuals to play their respective role in the national internet governance.
- e) Full engagement of the government with international, regional and sub-regional internet governance forums so as to become prominent player in the global internet policy decision making process.
- f) Secure the national interest based on the win-win principles by participating in the regional and international forums and make use of the best practices and procedures gained.
- g) Make internet governance a national ICT development agenda.

2.8. ICT for Government Administration and Services (E-Government)

1. Overview

Within the frame work of public sector capacity building program, the Government has initiated a series of measures to make the civil and public service more efficient and effective in the delivery of government services, along with institutional reforms improvements in working processes and procedures, and attitudinal and general reorientation to thrive democratic thoughts. In recognition of the critical role that ICT plays in consolidating the process of democratization and strengthening of good governance and national institutions, the government has taken wide-ranging measures for its development both at the federal and regional levels.

The government intends to expand and deepen the use of ICT in the public and civil service in order to achieve the following goals and objectives whilst pursuing appropriate strategies.

2. Goal

To modernize and streamline public sector management, in order to achieve an efficient and effective delivery of public services, through the implementation and utilization of E - Government systems.

3. Objectives

To implement the ICT for Government Administration and Services (E- Government) the following objectives are set.

- a) To develop and implement Woreda-Net, a robust, flexible, and scalable information and communications infrastructure, that would capably support federal, regional and lower-level administration intra and inter-agency electronic service delivery and information exchange.
- b) To reduce administrative, operational and transaction costs of federal and regional governments, and their structures found at all levels through extensive use of electronic media for their communications, and efficient and effective service deliveries.
- c) To facilitate ease of availability of information and government services to enhance good governance and consolidate democratization.

4. Strategies

To implement the ICT for Government Administration and Services (E- Government) the following strategies are set.

- a) Develop and implement a comprehensive E–Government strategy, targeting Government to Government (G2G), Government to Business (G2B), Government to citizen (G2C) and Government to Employee (G2E).
- b) Develop programs to improve and upgrade the computer skills of civil and public servants through on the job training.

- c) Develop standards, guidelines and procedures regarding the acquisition, installation and maintenance of ICT systems, software and equipment in public sector institutions.
- d) Adopt and implement an open policy for use of proprietary, free and/or open source software systems in developing E-Government solution.
- e) Encourage multimedia-based content and application development, mass communication and information delivery.
- f) Develop national government portals with major national languages and establish a follow up mechanism after deployment.
- g) Deliver the government services to the citizens through electronic means like mobile applications, public ICT centers and public information kiosks located at rural and urban areas and follow up their service quality.
- h) Encourage individuals to own computer as well as to use internet service throughout the country.

2.8.1. ICT for the Education Sector

1. Overview

The Ethiopian Government acknowledges education and training as the cornerstone of social progress and economic development. Thus, the human resource development should be supported and accelerated by applying ICT.

ICT facilitates the development of education and enables both individuals and countries to meet the challenges presented by the knowledge and information age. As the vast majority of Ethiopian population lives in remote areas and gets low quality of education, ICT is crucial in addressing access and quality of education. Therefore, the Government commits itself to the exploitation and application of ICT

for educational development in the context of the following goal, objectives and strategies.

2. Goal

Ensure that ICT is an integral part of the educational and training system at all levels, and wherever possible, ICT shall be used to extensively deliver education.

3. Objectives

To implement ICT for the educational sector the following objectives are set.

- a) To ensure that ICT is an integral part of the national education systems to expand quality ICT education and make it accessible.
- b) To ensure that application and usage of basic computer literacy is accessed by broadening ICT culture and awareness through universal education.
- c) To develop standards of evaluation and guidelines for the development and exploitation of ICT in schools, colleges and universities.
- d) To facilitate favorable conditions to women, disabled and special groups of the society for unhindered access to ICT by providing the necessary training and skills.
- e) To promote Internet-connected schools and higher education institution (School-Net and EthERNet) to speed up and support mass ICT literacy effort in the society.
- f) To transform the existing traditional public libraries into a digitally networked system of libraries using ICT, and establish a new ones.
- g) To broaden access to education and training opportunities by promoting electronic distance education and virtual learning.
- h) To promote private sector participation in ICT-related education and training in secondary and tertiary education.

- i) To collaborate with the private sector, bilateral, and multilateral organizations and institutions in promoting ICT-related education and training within the country.

4. Strategies

To implement ICT for the educational sector the following strategies will be implemented.

- a) Upgrade school's curricula to include ICT education in colleges and universities.
- b) Achieve a critical mass of computer literate ICT teachers by availing training to teachers, as well as, improving their working conditions.
- c) Encourage the production, acquisition and mass distribution of educational materials, basic electronic media and facilities at affordable prices.
- d) Devise affordable financial packages and schemas for teachers and students to acquire ICT products including computer hardware and software.
- e) Expand the on-going electronic education program to embrace all levels of education and training across the country.
- f) Link academic institutions and libraries electronically so as to enable both teachers and students access recent knowledge and information resources.
- g) Encourage the production, acquisition and distribution of digital educational materials.
- h) Develop special ICT training programs for women and the disabled in order to address gender and social inequalities.
- i) Facilitate Public Private Partnerships to mobilize resources in order to support e-learning initiatives.

2.8.2 ICT for Improved Health Service

1. Overview

Several countries are known to exploit ICT in the modernization of their health sector. Its specific applications include the delivery of health services in areas such as telemedicine, health sector management, database on health information, health education, etc. The application of ICT in support of health service delivery is of particular importance to countries such as Ethiopia with underdeveloped infrastructure and with a large segment of the population living in inaccessible rural areas.

The government will commit itself to a nation-wide application of ICT for health sector service delivery, with the following specific goal, objectives and strategies.

2. Goal

Modernize and expand improved health services coverage using ICT.

3. Objective

ICT for Improved Health Service will have the following objectives.

- a) To ensure the effectiveness of the national health policy and strategy, which is based on preventive measures, through public dissemination of medical information using the Internet on basic health care and ways to prevent contagious diseases.
- b) To establish a general database of health information center and disseminate information aimed at improving health service delivery, coverage and quality across the country.
- c) To introduce a Health-Net program for health professionals to keep abreast of developments on diseases and their cures.
- d) Linking hospitals, health research institutes and health centers with information network at the federal and regional levels.

4. Strategies

To implement the ICT for Improved Health Service the following strategies are developed.

- a) Develop and implement the national health information systems.
- b) Create an electronic information network for rapid access by health professionals throughout the country on health, pharmaceutical information, etc.
- c) Upgrade and modernize the administration and management of health service across the country using ICT.
- d) Promote the development of telemedicine applications and improve access to cost effective health care services across the country.
- e) Use ICT to disseminate health messages to prevent the spread of disease.
- f) Develop and implement applications which promote access to cost effective health services throughout the country.
- g) Provide training using ICT, including distant education, for health professional.

2.8.3 ICT for Modern Agricultural Sector

1. Overview

Agriculture forms the backbone of Ethiopia's Economy. It employs over 80 percent of the rural population and accounts for an equally large share of export earnings.

In recognition of the potential use of ICT for agriculture modernization, the government is committed to the exploitation and application of ICT in the context of the following goal, objectives strategies.

2. Goal

To improve the productivity and competitiveness of agriculture through the application of ICT by plan, by implementation, by follow up and by the process of information exchange.

3. Objectives

ICT for Modern Agricultural Sector will have the following objectives.

- a) To improve the agricultural sector productivity by the application of ICT.
- b) To support the agricultural products to be competitive globally using ICT services during the process of production and commodity exchange.
- c) To develop and maintain nation-wide geographical information system to monitor agricultural land use and natural resources management.
- d) To ensure sustainable and rapid development through the application of ICT in agricultural development.

4. Strategies

To implement the ICT for Modern Agricultural Sector the following strategies are devised.

- a) Develop and implement integrated agricultural development information system (Agri-Net).
- b) Create integrated and harmonized agricultural information disseminating system so as farmers and pastoralists across the country have access to information.
- c) Expand modern agricultural marketing system to provide farmers and pastoralists with agricultural data and information by using ICTs to establish rural multi-media centers and information terminals.
- d) Promote the application of ICT by agro-based industries to enable them add value to the country's agricultural produce.
- e) Establish a national agricultural data center to promote the country's agricultural resource potential.
- f) Facilitate access to regional agro-meteorological database and early warning systems at federal, regional and district levels.

- g) Encourage farmers' and pastoralists associations to advertise their produces through the Internet.
- h) Establish electronic animal monitoring system that is able to track the entire livestock life cycle thereby enhancing safety and increasing confidence for wholesalers and retail consumers.
- i) Establish community based information centers offering basic computer skills to farmers, pastoralists, extension workers and other beneficiaries in rural areas.

2.9. ICT Industry Development

1. Overview

It is obvious that the development of the economy in general and ICT in particular, critically depends on active participation of the private sector. Even though the ICT industry sector at present is quite small, it has shown dynamic growth in recent years. At present, individuals and small businesses are providing services and employment.

Since the private sector plays a crucial role in accelerating the development of ICT industry, the Government is committed to removing obstacles constraining its development.

2. Goal

Develop an efficient and globally competitive ICT Industry.

3. Objectives

ICT Industry and the Private Sector Development will have the following objectives.

- a) To take necessary measures that benefits the private sector from the expansion and consolidation of ICT industry development.
- b) To encourage domestic and foreign direct investment environment for the development of ICT.

- c) To develop the competitive capacity of the private sector in national and international markets.
- d) To encourage the private sector to provide and expand ICT services to rural areas.
- e) To promote ICT as a tool for employment opportunities and entrepreneurial development in small businesses.
- f) To support enterprises which produce electronic out puts for the purpose of public services.

4. Strategies

In ICT Industry and the Private Sector Development the following strategies will be implemented.

- a) Create and enabling legal, regulatory and institutional frame work that encourages domestic and foreign direct investment.
- b) Encourage and support the private sector with special incentives that would enable it develops into a globally competitive ICT industry and service provider.
- c) To give proper support to the private sector to play its role in the endeavor to use ICT as a development tool.
- d) Offer special incentives to the private sector to provide ICT services to rural areas.
- e) Establish ICT business incubators.
- f) Promote the development of ICT parks.
- g) Develop an ICT manufacturing information system featuring data on production, employment and trade as well as investment and other incentives to market the status and potential of the industry.
- h) Organize local and international exhibitions and workshop to foster the experiences and to build business-to-business relationship.

2.10. Computer and Related Services Development

1. Overview

A robust national software system is essential to maximize effective use of ICT and ensure its sustainability. Applications, services and content all need to be adapted to the local context and languages. At the same time, there are opportunities for Ethiopia to develop the export potential of the sector. The national software development and related services industry can help modernize the economy, contribute to economic growth and create jobs.

Building a strong software and computer services industry requires capacity building, developing quality assurance standards, creating an enabling business environment, enhancing access to finance, ensuring an appropriate legal environment, ensuring availability of e-payment systems and last but not least, boosting domestic demand.

2. Goal

To create strong national software industry to enhance the development impacts of ICT on the usage of computer and related services.

3. Objectives

To improve Computer and Related Services the following objectives are set.

- a) Facilitate growth of computer software and services, particularly local SMEs;
- b) Encourage domestic and foreign investment for the development of computer software and services.
- c) Develop the competitive capacity of the computer software and services in national and international markets.
- d) Leverage the computer software and services sector to develop locally relevant applications, software and services that can be exported.

4. Strategies

To improve Computer and Related Services the following strategies will be implemented.

- a) Leverage the ICT Village to provide incentives for software developers and for foreign investment.
- b) Facilitate access to finance through steps such as guaranteed loans for micro and SMEs and incentives for the creation of venture capital funds.
- c) Encourage companies in the mobile sector to support mobile application software developers through mobile labs, competitions, internships, etc.
- d) Promote certification and quality assurance.
- e) Promote software skills development through the education system and private sector.
- f) Stimulate demand through public procurement and promotion of greater use by private sector.
- g) Develop program to grow software and hardware exports.
- h) Facilitate electronic payments.

2.11. ICT for Entrepreneurship and Innovation

1. Overview

The emergence of small entrepreneurs developing innovative products is a trend visible throughout the world. Though many fail, those that manage to scale up create jobs at a disproportionate rate. Start-up founders are also young and college educated and thus can help alleviate unemployment among university-educated youth. Successful tech start-ups have a significant impact on business models through the introduction of new goods and services that are typically ICT enabled. Social entrepreneurs are relevant in Ethiopia's context through the application of goods and services with development impacts.

2. Goal

To enable a vibrant ecosystem for innovative entrepreneurs.

3. Objectives

To encourage ICT for Entrepreneurship and Innovation the following objectives are set.

- a) To create a thriving startup ecosystem.
- b) To facilitate the growth of social entrepreneurs.

4. Strategies

To encourage ICT for Entrepreneurship and Innovation the following strategies will be implanted.

- a) Encourage and support the local private sector particularly SMEs with special incentives that would enable them to participate in the ICT manufacturing industry.
- b) Leverage the ICT Village for incubation and acceleration of startups.
- c) Facilitate the startup business environment in areas such as business registration.
- d) Promote networking among the startup community through events, workshops, and competitions and foster links between startups and larger companies.
- e) Introduce dedicated funding options for small tech entrepreneurs.
- f) Tap the innovative ideas of social entrepreneurs for their potential in relevant areas such as government, health, education and rural development.
- g) Facilitate and promote e-payment solutions.

2.12. ICT for Youth and Women

1. Overview

Across the world technology has played an important role in empowering role for youth and women. It has helped them mobilize, collaborate and given them a voice.

It has connected young people and women across geographical divides to respond to social concerns.

ICT can engage and motivate youth and women to get involved in developing and learning about their communities and thus forge increased commitment and empowerment. Targeting youth and women, in particular, by promoting better and more inclusive access to ICT for enhancing their academic, social and economic development is crucial to closing the gender gap.

Promoting universal, non-discriminatory, equitable and affordable access of youth and women to ICT is central to ensuring digital and social inclusion. In recognition of these facts, the Government is committed to improving the access of ICT for Youth and Women through the following goal, objectives and strategies.

2. Goal

Increase the benefit of access to various forms of ICT by youth and women across all the regions.

3 Objectives

To deliver ICT for Youth and Women the following objectives are set.

- a) To ensure the provision of youth and gender friendly and safe access to broadband Internet across the whole country.
- b) To ensure that IT plays a key role as an empowerment tool, addressing access gaps relating to youth and women.
- c) To increase the number of youth and women in the ICT industry.

4. Strategies

To deliver ICT for Youth and Women the following strategies will be implemented.

- a) Ensure that the educational system provides equal opportunities for all students to develop advanced ICT skills and provide equal opportunities for women to work in ICT jobs.

- b) Provide free or subsidized ICT services for non-profit groups targeting youth and women.
- c) Ensure that the educational system provides equal opportunities for all students to learn how to use ICTs.
- d) Support young or female tech innovators and entrepreneurs through special programs, initiatives and competitions.
- e) Ensure the proper legal and corresponding computer framework exists to prevent the dissemination of harmful and offensive content or cyber-bullying which disproportionately affects youth and women.

2.13 Research and Technology Transfer

1. Overview

The research and technology transfer activities in general and in the ICT sector in particular, are far from developed in Ethiopia presently. The Government considers investment in R&D a necessary precondition for a sustained development not only of ICT but also for scientific progress.

In recognition of the important role that research and development transfer plays in facilitating the country's socio-economic development process in general and ICT in particular, the Government commits itself to the following specific goal, objectives and strategies.

2. Goal

Develop the country's ICT research and development (R & D) capacity to support, facilitate and contribute to the development of the nation.

3. Objectives

To build capacity in ICT Research and Technology Transfer the following objectives are set.

- a) To ensure that research projects and programs aimed at solving logical problems, meet national needs and at the same time, enhance the development of professional skills.
- b) To support research and development transfer within research-oriented institutions such as higher educational institutions and laboratories.
- c) To harness research and development transfer capabilities and global best practices by promoting collaboration between the country's ICT centers of excellence and those of other countries.
- d) To encourage participation in research undertakings by ICT professionals.

4. Strategies

To build capacity in ICT Research and Technology Transfer the following strategies will be implemented.

- a) Develop an ICT research and Technology transfer policy and strategy.
- b) Allocate adequate resources /budget to research and Technology transfer for hardware and software development, communications, information networks, technology etc.
- c) Promote applied and need-based research and Technology transfer activities so as to increase the levels of technological innovation.
- d) Promote research and Technology transfer in areas such as standard character-set, language interoperability, electronic dictionaries and thesaurus uses, and multilingual search engines for widely spoken indigenous languages, in order to facilitate accessibility.
- e) Network research Technology transfer activities conducted by public and private establishments for sharing best practices from lessons learned across sectors.
- f) Provide different incentives to the private sector to invest in research and Technology transfer activities.

- g) Disseminate information on new development in ICT arising from research findings.

CHAPTER THREE

A FRAMEWORK FOR POLICY IMPLEMENTATION

3.1 Overview

The priority issue of ICT policy is the required institutional framework to implement the policy. Because of the across the board nature of the ICT policy, the success of its implementation needs the involvement of all sectors and levels of government, the private sector, civil society organizations and the international community. From this perspective, it is imperative that the Government must create the necessary legal and regulatory environment, mobilize public and private sector resources, strengthen and/or setup relevant institutions, and provide strategic leadership for implementing the policy. Strategic leadership is required to coordinate ICT initiatives across all sectors and regions and among all stakeholders involved in ICT development, each with specific roles and responsibilities. This will enhance cross-sectional linkages, optimize synergies and avoid overlapping of efforts, duplicity and wastage of scarce resources.

While the Government will assume leadership for implementing the policy, the following are the key stakeholders who will play specific roles expected of them.

- a) Government organizations
- b) The private sector
- c) Educational and research centers.
- d) Civil society organizations
- e) Mass Media
- f) Developmental partners

g) The International Community, etc.

The Government will take appropriate measures to facilitate the implementation of ICT at federal and regional levels and to formulate sector based ICT policies, strategies, plans and programs. The private sector is also encouraged to contribute to these activities and play its role pro-actively.

3.2. Institutional Structure /Arrangement/

In recognition of the existing institutional shortcomings to support and facilitate ICT development, the Government has put in place the necessary institutional building blocks required for the development of a robust ICT sector. In part, the measures taken were dictated by the rapid evolution of the ICT industry world-wide and the similar situation being observed in Ethiopia. Amongst the measures taken thus far is the establishment of the Ministry of Communication and Information (MCIT) by merging the mandates and the responsibilities of the then Ethiopian ICT Development Agency, the then Ethiopian Telecommunication Agency and the mandate given for the communication wing off the then Ministry of Transport and Communication. The Ministry is given a mandate to formulate ICT policies and strategies, and coordinate their implementation. The Ministry's basic objective is to create a conducive environment for the development of ICT; and for its effective application in the process of national development. Its important function is to "use information and communication technology" in such a way that it contributes to the nation's socio-economic development and the building of democracy and good governance. Other key players and stakeholders facilitating and supporting the development and implementation of ICT in Ethiopia include the Ethiopian Science and Technology Ministry, Information Network Security Agency (INSA), the Ethio telecom, the Ethiopian Broadcasting Authority and the ICT unit for Educational sectors.

Additionally, to support the implementation of ICT policy due consideration will be given to the following issues.

- a) Establishing a National ICT council (NICTC), members of this council will constitute representatives of the academic, professionals and civil society organizations.
- b) Establishing a body that coordinates and supervises those government institutions with national responsibilities to supervise and monitor the implementation of ICT basic development policy as well as the sector.
- c) Developing adequate and sustainable capacity at all levels of government and across different sectors for formulating and implementing national ICT programs and projects.
- d) Articulating public and private sector partnership modalities for national ICT development.
- e) Integrating on-going ICT related programs and projects into national ICT development plans and programs.

The Government will further commit itself to making the necessary changes to existing institutions as well as make new arrangements, as and when the need arises, to facilitate implementation of the policy. The various elements of the policy need to be revised periodically with changes in the country's development priorities as well as global ICT environment.

3.3. Monitoring and Evaluation

It is necessary to put in place mechanisms to ensure that the development and implementation of ICT policies and strategies, as well as plans and programs are well coordinated. In this regard, Ministry of Communication and Information Technology is given the responsibility for coordinating, monitoring and evaluating implementation of the policy. The Ministry will provide the institutional framework for designing mechanism to ensure that implementation of the policy is on track, and that it is regularly monitored and evaluated. This is in order to ensure that policy goals, objectives and targets are achieved, and that corrective and timely measures are taken, including revision of the policy when the need arises.

The ICT Policy and Strategy implementation coordination, monitoring and evaluation mechanisms include the following activities.

- a) Facilitating and coordinating the national ICT policy, plans, programs and strategies.
- b) Ensuring that there are no duplications or overlapping of efforts which result in wastage of resources in the process of ICT plan and program development.
- c) Establishing performance indicators and targets to measure effectiveness.
- d) Setting standards to ensure effective project management and accountability for national and sector specific programs and projects.
- e) Creating a website to allow ICT users, throughout the country, to provide voluntary reports on actual broadband speeds (for instance, by using a speed monitoring app) and on service quality and outages
- f) Strengthening partnership and collaboration with regional and international organizations for best practices.
- g) Actively promoting the development of ICT as a sector in collaboration with stakeholders.
- h) Recruiting and retaining competent and qualified staff for Ethiopia's accelerated ICT development by enhancing the Ministry's financial capacity.

3.4. The Way Forward: National ICT Master Plan

The implementation of the policy entails the development of a national ICT master plan along with the mobilization of the requisite resources for its implementation. The master plan defines benchmarks, targets and responsibilities for monitoring and evaluating performance in policy implementation. Government agencies will formulate their specific plans and programs within the framework of the objectives

and strategies set out in the national master plan. Both the national plan and sector plans and programs will be supported by action plans as guides for implementation.

In order to facilitate implementation of the ICT policy at federal and regional levels of government, and to draw up sector specific ICT policies and strategies, plans and programs, appropriate structures will be established by public sector organizations.

The private sector will also be encouraged to do likewise.

The final goal of the ICT policy is by effective utilization of ICT, to bring about significant development nation-wide in all sectors and in all citizens walks of life.