



Republic of Mozambique

Draft Policy for Information and Communication Technologies

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COMMISSION FOR INFORMATION AND COMMUNICATION TECHNOLOGY POLICY

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Mission

Today's world is profoundly marked by the revolution in information and communication technologies which have given rise to the global information society with the Internet as its highest exponent. Therein, information and knowledge circulate at unprecedented speed and affect all aspects of life and economic, political and social activity. In this information age, it is the ability to use effectively and efficiently the information and communication technologies that determines a country's competitiveness and relevance in the global economy.

Mozambique cannot remain at the margins of this world revolution. Consequently, the government is adopting an Information and Communication Technology Policy to:

- *make Mozambique a relevant and competitive partner in the global information society;*
- *contribute in the war against poverty and to improve Mozambican's living conditions;*
- *guarantee citizens access to the benefits of global knowledge;*
- *improve governance and public administration;*
- *raise the efficiency and efficacy of state institutions and the usefulness of their services; and*
- *make Mozambique a producer, not a mere consumer, of information and communication technologies.*

Toward a Global Information Society!

Introduction

The 19th century was that of Industrial Revolution; the 20th century was undoubtedly that of the Information Revolution, a revolution in information and communication technology, a revolution perhaps more profound and radical than the first.

Throughout this document, the term *information and communication technologies (ICTs)* refers to the confluence and convergence of technologies that were previously non-existent or functioned as completely separate areas: personal computers and computer networks; radio and television; telephone lines with operators or with automated answering systems; fax machines; smart cards; electronic mail; the Internet; video-conferencing systems; commercial applications (word processors, spreadsheets, databases, etc.); and proprietary applications such as decision-support systems and management-information systems.

Information and communications technologies (ICTs) have permitted the diffusion of knowledge and sharing of information, experiences and resources with a speed previously unheard of. Experience shows that access to and use of these technologies are critical for the socio-economic development of individuals, communities and nations and for the increase of their relevance and competitive capacity in life and the global..

The growth of the Internet—today the world’s largest communication network—synthesises and epitomises the reality of the global information society in which the exchange of ideas and commercial transactions are done real time, transcending physical frontiers between countries as well as other barriers.

Unfortunately, that which has come to characterise modern life in nearly the whole world is little felt in Mozambique and the majority of African countries, which continue to have the lowest teledensities in the world and the fewest computers and Internet users, thus depriving citizens of what in most parts of the world is accessible by a mouse click or the touch of a keyboard. For the country to be competitive, this situation must change drastically.

We need to keep in mind that in the past few years Mozambique has grown considerably in its knowledge and use of ITCs. The absence of a policy orienting developments in this field has led to the adoption of mutually incompatible solutions (at times within the same institution), unnecessary duplication of efforts, and the concentration of scarce resources in certain zones, thus accentuating instead of reducing regional disequilibrium and asymmetries.

The *Information and Communication Technology Policy*, therefore, provides principles and objectives that will permit ICTs to be a motor force for various aspects of national development, contributing toward the country’s participation in the global economy on the basis of information and knowledge and to better governance, wide access by citizens to the information society, eradication of absolute poverty, improvement of the living conditions of Mozambicans, and the conversion of the country from a mere consumer to a producer of ICTs.

The *Information and Communication Policy* is comprehensive in scope: it covers all the areas relevant to the country’s socio-economic development. It is not, however, exhaustive in its enumeration of the areas to be considered in the programme for modernising and amplifying the ICTs used in the country. Here we mention only of areas of special interest and impact: education and development of human resources; health; the state’s role in the promotion of ICTs in development; the national infrastructure for ICTs; public governance and administration; public security; electronic commerce; agriculture; environment and natural resources; finance and investment in the ICT sector; and international co-operation. This does not imply that any unmentioned area will be left out.

The success of the *Information and Communication Technology Policy* will not be possible without the active participation of all interested persons and potential beneficiaries: the state organs; the public and private sectors; educational and research institutions; social, professional and non-governmental organisations; citizens; and the community.

Each and everyone should include an ICT component in their plans and development programmes. This is a huge task for a country in the Mozambique's condition: with limited resources, inadequate networks for telecommunications and electrical power, and, moreover, much illiteracy. But this challenge cannot be postponed or failed. If the costs are high for implementing a programme to modernise and amplify the ICTs used in the country, those of inaction would be yet higher.

The State of ICTs in Mozambique

With the realisation, from May to June 2000, of the first national survey of institutions, collective entities and individuals about the country's information-technology capacity, we will ascertain the country's real situation in this regard.

We begin, however, with some relevant facts about Mozambique:

Location: Southern Africa

Bordering countries: Tanzania, Malawi, Zambia, Zimbabwe, Swaziland and South Africa

Area: 799,380 km²

Population statistics

- *Total:* 16,917,000
- *Growth rate:* 2.72%
- *Ratio of men/100 women:* 92
- *Population density (inhab./km²):* 21

Where the population lives

- *In the city:* 29%
- *In rural areas:* 71%

Level of illiteracy

- *Total:* 60.5%
- *Urban:* 33.2%
- *Rural:* 72.2%

Life expectancy at birth

- *Average:* 42 years
- *Men:* 41 years
- *Women:* 44 years

GDP in billions of USD: 2.4 (1997)

Index of Human Development: 0.341 (UNDP 1997)

Ranking no IHD: 169 out of 174 countries (UNDP 1997)

Sources: *1997 Census* (National Institute of Statistics CD-Rom 1997) and *Human Development Report* (UNDP 1998)

If we focus on telecommunications, the table below is highly significance:

Designation	1997	1998
Capacity in telephonic commutation	104,556	105,612
Capacity of the national circuit	8,745	8,995
Capacity of the primary exterior circuit	126,049	129,424
Capacity of the secondary exterior circuit	171,107	176,177
Installed network lines	9,423	13,319
Network lines connected to subscribers	65,606	75,354
Cellular telephones	2,500	6,725

Considering that from 1997 to 1998, the telecommunications sector grew from 65,606 to 75,354 lines for subscribers, and from 2,500 to 6,725 cellular phones, it is evident that the sector is undergoing considerable growth especially in cellular phones which grew 169% as opposed to 15% for subscriber lines.

Meanwhile, the rate of national telephonic coverage reveals that Mozambique—with a teledensity of 0.46—has one of the lowest rates in the region.

As for Internet access—today one of the most obvious indicators of being or not part of the information society—Mozambique went from one Internet Service Provider (ISP) and less than 100 Internet users in 1995 to nine ISPs (five of which are connected to the server at Telecomunicações de Moçambique) and 6,000 users in 1998, that is one user per 3,000 inhabitants (better than the African average of 1:5,000, but much less than South Africa's 1:65, not to mention, the European average of 1:4. Since several Internet subscribers usually share a line, the actual number of people with Internet access could, however, be much higher than mentioned above.

These facts clearly point to the long path ahead that Mozambique, like many other African countries, has to alter radically its situation of underdevelopment. A very encouraging fact is that, even with its many problems and financial, infrastructural and technical limitations, Mozambique has taken a very positive attitude toward the adoption and local adaptation of ICTs for sustainable development and effective participation in the global information society and is now in eight place on the African continent (after South Africa, Egypt, Kenya, Zimbabwe, Morocco, Tunisia, and Ghana) in terms of the maturity of the Internet market and the number of its users.

Objectives of the Information and Communication Technology Policy

The absence of a policy or common reference led to the adoption of ICTs in a casual, disorderly and uncoordinated manner with all the negative consequences deriving therefrom: duplication of efforts, inadequacy and incompatibility of solutions, and unnecessarily high costs. Thus, the general objective of the *Information Communication Technology Policy* is to provide (i) points of reference for the harmonious development of the information society in Mozambique and (ii) a basis for legislation and plans of action in this field. The policy's main objectives are to:

- a) increase national consciousness about the role and potential of ICTs for the sustainable development of Mozambique;

- b) expand and develop training about information science, in the National System of Education;
- c) encourage and support the training of government authorities, community leaders, women, youths, and children about computer usage;
- d) contribute to the elimination of absolute poverty and the improvement of the standards of living for Mozambicans;
- e) contribute to increasing efficiency in the public and private sectors;
- f) provide universal access to information for all citizens in order to improve their level and productivity in education, science and technology, health, culture, entertainment, and in their other activities;
- g) create a favourable climate for industry, business and investment in ICTs;
- h) facilitate Mozambique's integration and participation in the local and global economy and in the global information society;
- i) ensure that all development plans and projects in every sector have ICT components;
- j) help to reduce and, eventually, eliminate all regional asymmetries and the differences between urban and rural areas, and between the various segments of society, as regards access to development opportunities;
- k) create a proper environment for co-operation and partnerships in ICTs, between the public and private sectors, and between all interested parties at the national, regional and international levels; and
- l) help Mozambique become a producer, not a mere consumer, of ICTs.

The role of the government and the private sector in the development of ICTs

The success of the implementation of the objectives of the *Information and Communication Technology Policy* depends, in large degree, upon the collaboration, synergies and partnerships set up between the government and the private sector on the basis of a clear definition of the responsibilities of each party.

The role of government

The fundamental role that the government plays in the development of ICTs and their application for the country's sustainable development entails (i) outlining a vision and a political and legal framework for regulating the intervention and articulation of all interested parties—public and private sectors, industries, information and communication services, non-government, professional and social organisations, and civil society— (ii) availing the necessary resources to implement that vision and policy, and (iii) systematically evaluating their outcome.

It is now urgent to abandon the state's traditional monopoly in telecommunications and create an environment for services to be offered competitively. However, since a strong national private sector does not exist, the government will need to help raise and channel resources for investment in infrastructure to support the ICTs in partnership with national and international entrepreneurs, whose undertakings will be of great future benefit.

The principal challenges that have to be faced are:

- the yet general absence of a culture and tradition of using ICTs; and
- the limited human resources, including technicians and financiers, available to stimulate the sector's development.

In this context the government will:

- a) approve quickly the legislation needed to implement the objectives in the *Information and Communication Technology Policy*;
- b) adopt a strategy for implementing that policy and integrating its objectives and goals into the programme for governance;
- c) dedicate all possible resources to the development of national infrastructures supporting ICTs in partnership with the private sector;
- d) promote the generalisation of the use of ICTs especially in state services and institutions;
- e) create incentive packages for investment in the national computer services industry;
- f) promote and support the production of Internet content that reflects the nation's reality and interests; and
- g) mobilise other countries, organisations and aid agencies to support the programme for the computerisation of the country.

The Role of the Private Sector

In industrialised countries, the private sector is undoubtedly the prime mover behind the development of ICTs. In Mozambique like in many African and Third World countries, the national private sector is incapable of assuming leadership of this process. Nevertheless, the emergent national entrepreneurs have a catalytic role in the constitution and consolidation of the information society of Mozambique, namely by:

- stimulating economic growth and participating in the development of national information infrastructure; and
- taking advantage of business opportunities resulting from the implementation of the information society.

Thus, under the umbrella of the *Information and Communication Technology Policy* and in strict collaboration with the government, the private sector will:

- a) exploit to the maximum the new business opportunities offered ICTs;
- b) disseminate the use of ICTs as a lever for entrepreneurial development, especially in small and medium businesses;
- c) strive to improve its products and services so as to guarantee their competitiveness in the global market; and
- d) support and participate in national efforts to generalise computer training and the use of ICTs for development.

Priority Areas of ICTs: Opportunities and Challenges:

As was indicated in the introduction, the *Information and Communication Technology Policy* is comprehensive in that it covers all the areas of interest for national development, though it is impossible to mention all of them here. For this reason, in this section, the priority areas are just enumerated though this does not denote that other benefits derived from ICTs are excluded.

ICTs and Education

Education is crucial for development, any development; and to improve and make educational services better and more effective, ICTs have an important role to play. Currently, the big challenges are:

- ❑ the high rate (about 60%) of illiteracy of the Mozambican;
- ❑ an inadequate network of schools despite the fact that in the last years it was possible to put replace and increase the number of schools that existed before the war became intense;
- ❑ the scarcity of finances and technicians to apply to existing problems;
- ❑ the existence of much of society with no access to schools, especially in rural areas; and
- ❑ the insufficiency of support material for the teaching/learning process, both for teachers and students.

ICTs offer education various opportunities (especially from the Internet):

- ❑ support systems for educational administration, including enrolment, exams, teacher motivation, and even financial management;
- ❑ networks of schools (e.g., SchoolNet) connected electronically to share resources and ensure the exchange of information between teachers and students and between teachers and parents or guardians;
- ❑ distance learning or virtual schools, making use of multimedia technologies to have one teacher in one location and thousands of students spread out over the country, thus eliminating the significance of physical distance; and
- ❑ availability of study materials and help for students and teachers, via the Internet, directly to schools or telecentres and other community-access points;

To best benefit from the potential ICTs offer to education, the government will:

- a) provide incentives and develop the teaching of computer science at various levels in the National System of Education;
- b) generalise the use of the Internet in schools;
- c) select teachers to be especially trained as promoters of ICTs in schools;
- d) promote of courses and national expositions about ICTs for the benefit of young scientists;
- e) progressively endow schools with equipment indispensable for access to ICTs.

ICTs and Development of Human Resources

The development of the economy or any other sector of a country depends above all on the quality of human resources. For example, the economic miracle of the Asian Tigers is explained by the high priority they placed on human capital, education, and the training of people to meet the requirements of development.

Among today's principal challenges, Mozambique:

- ❑ has a quantitatively and qualitatively limited reserve of well qualified ICT professionals;

- offers the training courses for computer technicians with content usually far below international standards;
- lacks a national hardware and software industry to stimulate training and specialisation in these areas; and
- lacks professional profiles and systems to evaluate and certify different computer science courses.

The government will, therefore, adopt the following measures:

- a) define professional profiles for ICTs in co-ordination with sectors involved;
- b) standardise the activity and functioning of ICT training centres;
- c) encourage training and internationally recognised certification of ICT professionals throughout the country;
- d) create centres of excellence for training ICT professionals and for the application of ICT solutions;
- e) establish ways to recognise and value ICT professionals;
- f) define minimum training programs for government and community leaders;
- g) promote competitions and prizes for those that distinguish themselves through innovating and using ICTs for solving the country's problems;
- h) promote ICT training through distance education; and
- h) define a high-quality training programme for ICT professionals as a high priority and indispensable condition for this sector's development.

ICTs and Health

Along with education, health is an indicator of the human development in a country. For this reason, it is a priority among the social goals of Mozambique's development programme.

Despite the nearly complete reconstitution of the health network during last five post-war years, the health situation is still characterised by:

- an insufficient health network and long distances from health centres for much of the population;
- a low life expectancy;
- an elevated infant-mortality rate;
- a high maternal death rate during births; and
- the prevalence of epidemics, including the rapid spread of HIV/AIDS .

In this context, the ICTs offer big opportunities that can benefit the health sector, including:

- improvement and modernisation of the administration of health services through ICT systems;
- better, more rigorous exams and medical diagnosis through collaboration with highly experienced specialists via telemedicine;

- better access for health professionals to up-to-date information about diseases and their cures plus the exchange of information between professionals through an electronic health network (HealthNet);
- public dissemination of medical information through the Internet, especially ways to prevent contagious diseases such as STDs, AIDS and tuberculosis and about basic health care and environmental sanitation;
- rapid transmission of data to and from clinics, laboratories, and image archives;
- creation of networks to enable rapid access to pharmaceutical information; and
- computerisation of blood banks and their systems for attending the public.

The ICTs also offer unique opportunities for public education about the advantages and risks of certain practices of traditional medicine so as to gain more acceptance and demand for modern preventative medicine and cures.

In this context, the government will:

- a) computerise as much as possible the administration of health services;
- b) extend telemedicine to the central and all provincial hospitals;
- c) create an electronic health-information network for health professionals;
- d) disclose, through the Internet, basic public health information about the nature of contagious diseases, especially STDs and HIV/AIDS, and the best ways to prevent them;
- e) create a computerised network of state pharmacies with up-to-date information about the availability or not of drugs;
- f) demonstrate to health professionals the benefits and advantages of using ICTs in their sector;
- g) disseminate success stories about utilisation of ICTs in the health sector; and
- h) encourage health professionals to acquire knowledge essential for them to use ICTs in their work.

Universal Access to Information and Communication Technologies

Of Mozambique's 17 million people, 70% live in rural areas, some quite remote and difficult to access. The distribution of population is very irregular: most people reside along the vast coast (3,000 km).

The term *universal access* comes from telecommunications and denotes the existence of "a phone within a reasonable distance of each residence". This concern comes from the recognition that it is very onerous for a poor country to think about installing a phone in each house.

The state recognises and protects the citizen's right to have access to information and knowledge through ICTs. It, therefore, intervenes through the *Information and Communication Technology Policy* and other means to guarantee the enjoyment of this right and appeals for the participation of various sectors toward the realisation of this objective.

Other large challenges and obstacles to the promotion of universal access are the limited telecommunications infrastructure (especially the telephone network), the high cost of communication for most people with low incomes, and the deficient coverage of the electricity network. To meet these challenges, the government will:

- a) promote universal access in the context of the global information society;
- b) create a universal service fund to which operators and the public and private providers of telecommunication services will contribute;
- c) create incentives for suppliers of telecommunication services to enter disadvantaged areas where the profits would normally be insufficient to attract the private sector;
- d) stimulate access to the Internet and to the various services of the information society;
- e) support the creation of a national network of public access points within a reasonable distance of residences and at prices affordable by low-income people;
- f) remove import tariffs from information and communication material and equipment destined for universal access;
- g) adopt measures to encourage the reduction of prices for telephone access and thus favour the expansion of the network to more users;
- i) establish a single tariff (equal to the price of a local call) for ISPs calling from anywhere in the country;
- j) establish a uniform tariff for electricity and communication services supplied to universal access points; and
- k) investigate other modern technologies more appropriate for the country's situation.

National Infrastructure for ICTs

With about 80,000 telephone lines and a teledensity of 0.46, Mozambique has one of the lowest indexes of telephone penetration in SADC, an index only better than Malawi and Tanzania. To aggravate this situation, 98% of the telephone lines are in the hands of the urban population. The rural population is nearly without coverage.

According to specialised studies, to reach a satisfactory situation, a teledensity of 35.9% is required. But, with the present growth rate, we would wait two generations to get there. The challenge is colossal, too much for the country to expect! For example, to obtain a penetration of just 1% by 2002 would require an investment of more than 300 million USD, that is 100 million USD annually.

Other areas of economic activity are, however, strongly influenced by our excellent access to the Indian Ocean which permits the development of road and railways linking Mozambique to inland countries. This is of primary importance in the design, implementation and investment in future solutions. For these, the principal vectors will continue to be the:

- stimulus and facilitation of economic development;
- increase in regional competitiveness;
- attraction of foreign investment; and
- efforts of the national private sector.

Since the development and use of ICTs are so intimately linked to the expansion of both the telecommunication infrastructure and the energy and transport networks, it is vital to expand and have a co-ordinated development of these sectors by applying cheaper modern solutions and giving preference to solar energy, wireless technologies, and, whenever viable, digital instead of analogue technology.

To consolidate and expand the infrastructural support for ICTs, the government proposes to intervene through sectoral policy as well as at the operational and technological level in order to:

- a) institutionalise a legal framework to enable the balanced, equitable development of infrastructure for the support of ICTs;
- b) design a modern architecture for the backbone of national telecommunication infrastructure so as to assure the transport and availability of advanced telecommunication services;
- c) create an infrastructure that will contribute to community-development programmes particularly in the rural areas;
- d) prepare and accelerate the restructuring and privatisation of the public telecommunications company;
- e) consolidate control mechanisms for the implementation of the law about the liberalisation of the telecommunication sector;
- f) stimulate the start-up of new telecommunication service providers and other value-added services appropriate for the global information society;
- g) promote and expand the use of digital radios and televisions;
- h) create a favourable environment for the private sector to participate in the development of telecommunications infrastructure;
- i) adopt private-public partnership programmes for the development of telecommunication infrastructures; and
- j) attract investors and international partners for the development of the national ICT infrastructure.

ICTs, Agriculture, Mineral Resources, Environment and Tourism

Most Mozambicans live in rural areas and are primarily small farmers. Their survival and daily consumption depends on their productivity and the quality of their farms' output. Since, from province to province, the country's agricultural output is very diverse, it is necessary to install a system for the exchange of information thus permitting greater communication, interprovincial complementarity, the exchange of surpluses.

As in other areas, many challenges must be overcome:

- ❑ lack of databases with information concerning the country's agricultural potential;
- ❑ lack of the exchange of information between regions in the country;
- ❑ insufficiency of modern machinery to predict the weather and prevent natural disasters;
- ❑ limited co-ordination of the implementation of national environmental policies; and
- ❑ lack of a system to control the monitoring and management of animal migration.

ICTs offer various opportunities for agriculture, environment, tourism, and natural resources, for example:

- ❑ dissemination—via the Internet and in collaboration with research institutions—of techniques or mechanisms for soil preservation and preparation;

- promotion of the exchange of information via the Internet about endangered animal and plant species and, by doing so, helping to improve environmental management;
- ample dissemination of information about the country through the use of geographical information service technologies;
- establishment of a national computer network connected to regional and international networks so as to promote complementarity between countries and the exchange of experiences; and
- international dissemination, via the Internet, of information about the country's tourist potential and, thereby, attracting tourists and investors.

So as to take best advantage of the opportunities ICTs offer, the government will:

- a) establish a support programme for farmers' associations and rural extension workers through by putting current information on the Internet about agricultural techniques and the management of natural resources;
- b) assist the telecentres in their programmes offering basic computer training to farmers and the rural population;
- c) encourage farmers and their associations to advertise and sell their products through the Internet;
- d) create a modern geographical information system;
- f) create an electronic system to control natural resources and the fauna in national parks;
- g) create a computerised system of notices and follow-ups about deforestation and environmental degradation; and
- i) announce, through the Internet, the country's tourist potentials so as to attract investment.

ICTs and Governance

Nowadays good governance is seen as an essential catalyst for efforts to spread the benefits of economic progress and the conquests of science to all citizens. But what is good governance? Interpretations vary. The most common is that it is a process whereby *(i)* public institutions fulfil optimally their duty to serve the public interest and *(ii)* business institutions and groups articulate their interests, exercise their rights and obligations, and resolve their differences.

In Mozambique, the problems and challenges of governance are immense and varied, for example:

- bureaucracy, slowness and inefficiency that characterise government and public institutions;
- high costs arising from the way public services are dispensed;
- absence of fast connections and communication between the central and provincial state organs and departments;
- absence of a centralised database with standardised and consistent information thus causing frequent discrepancies in information from department to department; and

- poor computer literacy among many our state leaders and the managers of public institutions and, consequently, an indifference or apathy about the role of ICTs can have for improving services.

In such circumstances, strong efforts must be made to publicise national and international best practices and experiences revealing the unparalleled opportunities offered by well implemented ICTs to improve local and central government operations, provide citizens public information and faster, more efficient services, and facilitate communication between them and government officials. World experience reveals impressive examples in education, health, investment promotion, improvement of the business climate and competition, promotion of a country's image, electronic communication between citizens and their leaders, and the fight against corruption.

To achieve the most from the potential of ICTs and improve its operations at all levels, the government will:

- a) elaborate a plan for computerising government services;
- b) define a general plan and profile of basic knowledge in informatics for state leaders at all levels, members of parliament, and community leaders;
- c) establish a network connecting provincial and central government organs and departments over the Internet;
- d) make compulsory the presence of central state organs and departments on the Internet;
- e) avail diverse information, including forms and other important printed material, through the Internet;
- f) encourage contact between leaders and citizens through electronic mail without this serving as a substitute for contact in person;
- g) introduce gradually electronic voting and other forms of computerisation for the electoral process; and
- h) create electronic systems to support decision making.

ICTs and Protection of the Public

The benefits from a planned adoption of ICTs with emphasis on the Internet were sufficiently shown in the previous sessions. Often, however, the implementation of ICTs is accompanied by annoyances and disenchantment, especially when these technologies operate with no policy framework for the systematic evaluation of their impact and adequacy for the actual situation and consequent necessities. Due to errors, maliciousness, or the abusive use of ICTs, much damage can occur, putting at risk the benefits of ICTs. Invasion of people's privacy, unauthorised publication of personal data held by institutions (for example, addresses and contacts), extortion, fraudulent operations or transactions, pornography, the sexual abuse of minors via the Internet, and the promotion of racism, xenophobia and neo-nazism: these are but a few of the phenomena that have become ever more common in today's world, where transgressors possess the immense power of ICTs. Moreover, unsolicited electronic commercial messages (known as spam) invade the systems of millions of Internet users.

ICTs are not a panacea and do not, by themselves, provide an antidote with universal applicability and efficacy. Hence, the state, as the guardian of the public good and its citizens' welfare and tranquillity, should take the required measures to assure the storage,

processing, transmission, and improvement of the quality, credibility and integrity of information and information systems. It should also improve or pass new laws to protect citizens against fraud, extortion, sabotage, terrorism, espionage, and the violation of their fundamental rights.

To ensure and improve the public's protection against different forms of abuse and electronic crime, the government will take the following steps among others:

- a) guarantee the protection of personal data on the national information infrastructure;
- b) adopt solutions and cryptographic systems less susceptible to violations;
- c) combat human rights violations and attacks against the public order and socio-cultural values, especially from pornography, violence, and abuse of women and minors through the Internet;
- d) stimulate and support the production and dissemination of Internet content that reflects the values of Mozambican society; and
- e) work with non-government organisations and society's other institutions for the treatment of civil and criminal offences.

ICTs, Electronic Commerce, and Protection of Businesses

Today the Internet is not only the largest global telecommunications network but also a global electronic market. Electronic commerce or e-commerce is the exchange or electronic transaction of services or products, including auctions conducted through the Internet. Electronic commerce offers many advantages by:

- ❑ eliminating the physical distance between seller and buyer;
- ❑ eliminating intermediaries;
- ❑ allowing a vast choice of products and suppliers;
- ❑ having low operational costs which helps to reduce the prices of goods and services; and
- ❑ not requiring big initial investments.

The rapid growth of electronic commerce does not happen without problems ranging from how to collect tariffs and other taxes on imported goods to how to standardise electronic signatures so as to validate, if necessary in court, the contracts and responsibilities agreed upon through the Internet.

The effectiveness of the electronic commerce in Mozambique as in other countries in Sub-Saharan African countries is an opportunity surrounded by challenges: it involves more than just knowing which goods and services can be involved or who sells or buys them and how to contact them. The problems and obstacles are related to the infrastructure (that is neither sufficient nor adequate), weak purchasing power, and the limited use of credit cards. But if the country wants to be an active and relevant participant in the global information society, it does not have any alternative: it must adopt new paradigms and new forms of commercial relations in the information era. Toward this end, within the present ICT policy framework, and in partnership with the ICT sector, the government will:

- a) undertake awareness and education programmes about the nature, benefits and risks associated with electronic commerce;

- b) support entrepreneurial initiatives, with special consideration for small and medium businesses that want to succeed through electronic commerce;
- d) update the law for the protection of intellectual property to cover specific aspects associated with electronic commerce;
- e) encourage and support the creation of a national association of Internet service providers and of a national branch of the Business Software Alliance (BSA); and
- f) establish mechanisms for the security for electronic transactions.

ICTs and National Network of Research Institutions

In the modern world, the level and speed of development depends on the process for creating knowledge which is so necessary for the design and implementation of sustainable economic projects. This process is supported by scientific research.

Within Mozambican context, various challenges exist for the creation of high-quality research, for example:

- ❑ the need to satisfy the large demand for up-to-date literature in all scientific areas;
- ❑ the absence of public information about university-level scientific work;
- ❑ the absence of the habit of exchanging bibliographical information on a national level;
- ❑ the lack of a national computer network for continuous communication between researchers in the diverse scientific areas; and
- ❑ the lack of incentives for technical inventions with excellent technical solutions.

In this context, ICTs can offer researchers various opportunities, especially those that result from the installation of networks with metropolitan, local or national coverage and access to international networks. These opportunities include:

- ❑ creation of a national network of research institutions connected online to allow our academics and scientists access, when necessary, scientific works and publications;
- ❑ establishment of an electronic network for bibliographic research to facilitate the circulation of literature existing at national and regional levels; and
- ❑ promotion of discussions about diverse scientific research topics to guarantee the continuity of research relevant for the country's development.

To take advantage of the application of ICTs to research, the government will stimulate:

- a) the creation of databases about national and international bibliography in all academic institutions;
- b) the computerisation and online connection of public and private libraries; and
- c) the computerisation of scientific research institutes and the creation of an electronic network among them and connections to similar institutions in the region or elsewhere.

The Funding of the ICT Policy

If not implemented, the *Information and Communication Technology Policy* would be of little or no value. The big challenge is that creation of an ICT infrastructure involves huge costs when the country is still developing and very dependent on foreign investment and aid. Among others, the challenges and obstacles to financing the ICT programme are:

- the scarcity of financial resources in the country;
- an insufficient consciousness about the importance and role that information and communication can have for extracting the country from its underdevelopment and making it more competitive in the international arena;
- the lack of a national computerisation programme that merits the consensus and support of the principal interested private and public sectors and could become an integral part of the national development plan;

Recognising the decisive role that ICTs can and should take in accelerating the balanced and sustainable development in the country, the government will:

- adopt a national integrated programme for the computerisation of the country as part of the national development plan;
- ensure financing for the national computerisation programme;
- create a favourable environment and a package of incentives for those who invest in ICTs, including training for the sector's human resources;
- orient investment so as to promote a harmonious and balanced development by directing new resources into the neediest areas and for the disadvantaged segments of society;
- define a national information infrastructure as the backbone for the development of ICTs and the highest priority for investment in the sector; and
- orient investment so as to make Mozambique a producer, not a mere consumer, of ICTs.

International Co-operation

Co-operation in the use and knowledge of ICTs is one of Mozambique's foreign policy objectives. The regional integration of African countries is the best path toward the continent's rapid and sustainable development. This is why regional communities such as the Southern African Development Community (SADC) and the African Economic Community and other initiatives were set up. The adoption of resolution 812 (XXXI), in May 1996 in Addis Ababa, for the implementation of the African Information Society Initiative (AISI), under the auspices of the Economic Commission for Africa (ECA), and the consultative conference's approval of the document, *The SADC in the New Millennium: the opportunities and challenges of information technology*, in Lusaka in February 1999, are clear indicators of the determination of the African continent and, specifically, of southern Africa to make ICTs a catalytic instrument for development.

To realise these high objectives, it is crucial that, besides political will, there exist an infrastructure and the information and communication services capable of stimulating and facilitating regional integration. Since Mozambique provides the most natural access to the

sea for inland countries, it is in a privileged position as the hub of the region's principal communication systems and, hence, was chosen as the co-ordinator for the transport and communication sectors in SADC.

If the challenges are enormous—e.g., the poor coverage and high cost of the communication network—bigger yet are the opportunities, e.g., the acceleration of a genuine regional economic integration, the reduction of developmental inequalities between countries, and the effective participation in the concert of nations and the global economy. Accordingly, in order to promote regional and international co-operation around ICTs, Mozambique proposes to:

- a) participate actively in the regional and international consultative organs for telecommunication, for example, in the Southern African Transport and Communication Commission (SATCC) and the International Telecommunications Union (ITU);
- b) participate actively in supra-national initiatives and projects (especially within Africa) so as to benefit from the potential of ICTs for development, e.g., in the African Virtual University, the African Development Forum (ADF), and the Global Knowledge Partnership (GKP);
- c) celebrate regional and international agreements, conventions and protocols for mutual advantage in ICTs;
- d) re-enforce partnerships with international institutions for standards, finance and co-operation for development and, thereby, increase the support for national and regional ICT initiatives;
- e) encourage and support all efforts by the public and private sectors to improve regional integration; and
- f) promote the wide dissemination throughout the nation of the best experiences and practices of other countries in the use of ICTs for development.

Implementation and Evaluation

The realisation of *Information and Communication Technology Policy* will be based on an implementation strategy taking into account the identified priority areas, constituting thereby the National Computerisation Programme. As much as possible, this programme will comprise projects to be implemented by various state sectors and institutions, the private sector, and other organisations within society. In this context, the areas to contemplate are:

- **Education:** distance learning, school administration, electronic libraries for schools, etc.;
- **Human resources development:** definition of profiles for the careers, training of information technology professionals, and provision of basic computer training for government officials and community leaders;
- **Universal access:** telecentres and community access points, adoption of legal measures to promote universal access, including the adoption of uniform telecommunication tariffs for community access points anywhere in the country;
- **Telecommunication infrastructures:** redesign of the national infrastructure for telecommunications so as to respond to the exigencies arising from the convergence of voice, video and data; expansion of rural infrastructures; capacitation of the network for radio and television; creation of a legal framework prioritising balanced and equitable development; stimulation and promotion of participation by entrepreneurs; enhancement of the

state's regulatory and fiscal capability; reorganisation of the public telecommunications company, and liberalisation of the sector;

- **Governance:** a computer network connection for all central and provincial state organs and departments; the presence on the Internet of ministries and other state agencies; centralised and standardised databases about employees, public financial accounts, property, laws, electoral procedures, assemblies and local governments;
- **Agriculture and natural resources:** publication, via the Internet, of techniques for agriculture and the community management of natural resources;
- **Tourism:** publication of information about the country's tourist potential;
- **Electronic commerce:** reform of commercial legislation to make it conform to the new demands of electronic commerce; encouragement and support for businessmen beginning electronic commerce.
- **Health:** creation of an electronic health network (HealthNet) especially for health professionals; public dissemination of information about contagious diseases, especially STD/AIDS; computerisation of blood banks;
- **Women and youth:** special initiatives to encourage women and youths to use ICTs; and
- **Culture and the arts:** electronic networks connecting cultural institutions such as libraries, museums, cultural centres, and art galleries; integration and sale of Mozambican art via e-commerce; electronic promotion of cultural tourism.

To cover the costs for implementation of the country's computerisation programme, the government will avail indispensable financial resources and mobilise international aid partners (e.g., World Bank, European Union, UNDP, and other United Nations agencies, ASDI/SAREC, IDRC) to finance specific areas of the programme.

To ensure the realisation, follow-up, and evaluation of the programme, the following measures will be taken:

- creation of an entity to focus on the development of the Information Society of Mozambique; and
- constitution of a consultative forum involving representatives of the state, the public and private sectors, universities, research institutions, industry, computer services, non-governmental organisations, civil and professional organisations, and civil society. This forum will hold two annual meetings to:
 - evaluate the reports that the Commission for Information and Communication Technology Policy and the above mentioned entity will present about the state of the nation concerning ICTs; and
 - recommend the adoption of appropriate measures and the necessary adjustments.