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Harnessing Information for Development

Information and communication technologies (ICTs), driven by the convergence of computers, telecommunications, and traditional media, are crucial for the knowledge-based economy of the future. Rapid advances in technology and the diminishing cost of acquiring new information and communication tools have opened windows of opportunity for accelerated economic and social development. The introduction of computers is revolutionizing the ability of print and broadcast media to amass and disseminate information. Powerful new technologies can also give African countries direct access to the world's knowledge base, expertise, markets, and financial resources.

Overview

Internet connectivity has increased in leaps and bounds in Africa, from just four countries connected in 1995 to 43 countries by late 1997, and an expected 49 by the end of 1998. Twelve countries are considered to have active and mature markets, including South Africa, which in terms of the number of Internet nodes ranks among the world's top 20 countries. Technologies are becoming more flexible, and technological sophistication is no longer a requirement for getting onto the global information superhighway.

In a globalized economy, technology can bring unprecedented competitive advantages. For example, ICTs have reduced the time it takes to identify and exploit opportunities for trade, investment, and finance, and have opened the way to small players.

To join the information revolution, however, Africa needs to develop capacity to tap into the global system of information and knowledge, and adapt it to solve its problems. This calls for public policies to address a range of serious impediments, including inadequate telecommunications systems, restrictive laws and regulations obstructing flows of information, and the shortage of trained professionals in computers, data management, science, engineering, and business.

Compared to the world average of roughly one user for every 40 people, Africa has one Internet user for every 500 people. Of the 700,000 to 1 million users estimated in Africa, the concentration is badly skewed, with some 600,000 living in South Africa. Most of the remaining users are concentrated in North Africa, where Morocco, Tunisia, and Egypt show the strongest Internet

growth. Other countries with more than 3,000 users each are Ghana, Ethiopia, Kenya, Namibia, Senegal, Tanzania, Zambia, and Zimbabwe.

Underpinning these demographics are political, social, economic, and infrastructural realities that continue to limit participation in the information society for millions of people living in the world's most impoverished societies, a large number of which are in Africa. Content (development information) development is another area of concern, requiring capacity building to foster the development of an African information society that reflects cultural diversity and indigenous knowledge.

Information poverty is an important component of poverty in Africa as a whole. In addition to access to schools, jobs, and clinics, an important dimension of human development is access to information. Access is a factor in changing attitudes and learning to seize opportunities. Weak communication and social infrastructure not only block information flows, but ultimately stifle social and economic development.

Emerging technologies hold great promise for democratizing access to information. By facilitating access to groups of people marginalized by dint of illiteracy or rural remoteness, the technologies can help accelerate development. Through enhanced information "infostructures", and improved data production and dissemination, information can be made a veritable agent for change, as well as a means towards prosperity in Africa.

Statistics is also a critical area for Africa's development. Timely and reliable statistical data are vital to successful planning and management of national and regional projects and programmes—be they public or private, social, economic, or environmental, and so on. To be most useful, data series should be collected and updated routinely and systematically. They should be geared to user needs and be easily accessible. But a shortage of statistical skills and a high turnover of staff in government statistical offices and training institutions have adversely affected statistics capability in Africa since the decade of independence. The Conference of African Statisticians in 1978 adopted a comprehensive programme—the Statistical Training Programme for Africa (STPA)—to ensure that national statistical services had a permanent supply of qualified statistical personnel. The regional component of the STPA was located at the Economic Commission for Africa (ECA) and was financed by the United Nations Development Programme (UNDP) up to 1993. Other bilateral and multilateral agencies assisted in the implementation of the programme, mainly at the national level.

The Challenge

Most African capitals with Internet access have more than one Internet Service Provider (ISP), where regulations permit. The profile of Internet users in Africa is still largely confined to companies, organizations, and relatively wealthy people in major cities. Few universities have full Internet connectivity. In most countries of the region, secondary cities have no local access to the Internet. Likewise, rural areas—where most Africans live—have little or no access. The obstacles to widespread usage of information technologies in Africa are daunting. Although African telecommunications are grossly inadequate, they are the most expensive in the world. South



Africa is developing the capacity to access the global system of information and knowledge sharing.

Africa aside, there are fewer telephone lines in Africa than in the city of New York. Investment in infrastructure requires heavy outlays and investors are unwilling to invest in new areas, particularly in rural areas, where 70 per cent of Africans live. While some argue that until adequate social services are available in Africa, widespread access to information technology will remain a luxury, the challenge is to harness information to fill some of the key development gaps.

In statistics, although the STPA became an excellent example of regional and donor cooperation, a number of problems continued to undermine the programme. The Addis Ababa Plan of Action for Statistical Development in Africa in the 1990s, which was adopted in May 1990 by ECA Conference of Ministers responsible for economic and social development, and the establishment of the Coordinating Committee on African Statistical Development (CASD) in 1992 did not solve underlying problems. Although CASD remains active to this date, programme implementation and performance at the country level have fallen short of expectations, leading to further deterioration of many national statistical services. Strengthening national statistical capabilities is a key challenge and critical to the success of planned censuses and subsequent statistical activities in a large number of countries.

The ECA Response

An important part of ECA's mission is to raise awareness among African governments of the great potential that ICTs and efficient statistical systems hold for development. The underpinning credo is that information assumes a greater power the more it is shared and accessed. Conversely, information that is retained or hidden is confined to those who have control over it, and its value is therefore greatly diminished.

ECA has been working since the 1979 launch of the Pan African Development Information System (PADIS) to promote information management and exchange systems in Africa. PADIS played a substantial role in enhancing the capacity of African countries to collect, store, retrieve, and disseminate information.

In May 1995, the ECA Conference of Ministers mandated the Commission to work towards building Africa's "information highway". As part of the overall ECA restructuring, the Development Information Services Division (DISD) was created in 1997 to help focus attention on information and communication technologies as well as statistical development, under its Harnessing Information for Development work programme. In order to provide a framework for a development serving the African information highway, ECA developed the African Information Society Initiative (see box 11).

Policy Advocacy towards National Information Infrastructures. Developing National Information and Communication Infrastructure (NICI) plans is central to the implementation of the African Information Society Initiative (AISDI), and appears prominently in the framework. As one of the first steps towards the building of an African information society, and to ensure that such a society is predicated upon and enables sustainable development, Member States need to put in place the necessary policy, legislative, and regulatory frameworks at national level.

In cooperation with its partners, ECA has embarked upon NICI plans for development processes in a number of countries, including the Comoros, Eritrea, Lesotho, Namibia, Rwanda, Swaziland, and Uganda. ECA has received and is studying requests for interventions in a number of other countries. In addition, ECA is assisting the Regional Economic Communities (RECs), which govern regional integration in the African subregions, in human resource development and infrastructure building to better enable them to meet the needs of their Member States.

Developing Subregional Centres of Excellence. Capacity remains a major constraint. Through the identification of the socioeconomic priorities of a particular country, the NICI plans study the best way to use IT to meet those needs. ECA is currently implementing a project to develop training centres of excellence at national and subregional levels, using existing infrastructure such as universities and schools of technology and telecommunications.

In August 1998, ECA ran a 15-day training workshop in Zimbabwe's second city, Bulawayo, spawning Africa's first subregional centre of excellence. The workshop was hosted by the National University of Science and Technology, and

was attended by 15 technicians and MA computer science students from five Southern African countries. The project was financed by a grant from the Carnegie Corporation of New York, and co-sponsored by ECA and United Nations Educational,

Box 11. The Africa Information Society Initiative

The Africa Information Society Initiative (AISI) was conceived as an action framework to leapfrog Africa into the information age (see subsection below). It was formulated in 1996 by a High-Level Working Group of African experts assembled by the Commission, and endorsed by ECA's Conference of Ministers, African Communications Ministers, the Organization of African Unity, and the Summit of the Eight in Denver in 1997. ECA's Development Information Services Division (DISD) is the focal point for coordinating and implementing AISI, in coordination with United Nations and other agency partners and institutions. Various African policy organs have endorsed AISI.

In this, AISI is a forerunner to the Harnessing Information Technology for Development priority cluster of the UN System-Wide Special Initiative on Africa, which aims to help build the necessary infrastructure for construction of the African information society. It is also in line with the regional integration goals of the Treaty establishing the Africa Economic Community, which foresaw the need for information networks and regional databases, information sources, and skills capacities. As the coordinating body for AISI, ECA is supporting ICT activities designed to accelerate socioeconomic development across the African region.

During 1997, ECA established the African Technical Advisory Committee (ATAC) to the AISI, which provides Africa-wide visionary guidance to ECA's information and communication programmes. ATAC is made up of six experts representing the public sector, private sector, universities, research institutions, and NGOs, and includes one content adviser. The Commission has also established an informal group of development partners.

Partnership on ICTs in Africa (PICTA) is a forum for sharing information on the implementation of ICT projects on the continent, and for coordinating AISI activities. AISI partners include multilaterals, bilaterals,

NGOs, the private sector, and foundations. Members and lead agencies include Bellanet, IDRC, ITU, UNDP, UNESCO, UNCTAD, the World Bank, WTO, the Global Information Infrastructure Commission, the WorldSpace Corporation, Mashav (Israel), the European Union, the Carnegie Corporation of New York, the USAID Leland Initiative, the British Council and the European Union. PICTA members share information on ongoing projects, and develop and implement a joint work programme, producing synergy and adding value to move AISI implementation forward. The first PICTA meeting, which set the terms of reference, took place in Rabat, Morocco, in April 1997. The second, held in October 1997 in Addis Ababa, Ethiopia, adopted a work programme for 1998 and 1999, and agreed on cooperation in policy, training and capacity building, telecentres, content development, and local knowledge. The third meeting, which took place in Tunis in October 1998, emphasized the number of successes PICTA had registered to date, including the burst of energy around telecentre development in Africa and the funding generated by it. The June 1998 Addis Ababa Global Connectivity for Africa Conference (see box 12) was also cited as a PICTA working group effort. It was emphasized that the nature of PICTA was the process rather than the organization.

AISI ACTION FRAMEWORK. To achieve its goal of a sustainable information society in Africa by 2010, the AISI framework calls on African countries to implement the following actions:

- Develop a national plan for building information and communication infrastructure;
- Eliminate or reduce import tariffs, taxes, and other legal barriers to the use of information and communication technologies;

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(box 11 continued)

- Establish an enabling environment to foster the free flow and development of information and communication in society;
- Implement a policy for using information and communication technologies in government services;
- Conduct needs analyses to determine requirements and set up information and communication services in key sectors of national priority;
- Identify and develop information technology applications in areas with highest impact on socioeconomic development at the national level;
- Take steps to facilitate the establishment of indigenous African information content and locally based, low-cost, and widely accessible Internet services;
- Prepare and adopt plans to develop human resources in information and communication technologies;
- Adopt policies and strategies to increase access to information and communication facilities with priorities in serving rural areas, grassroots society, and other disenfranchised groups, particularly women and youth; and
- Create and raise awareness of the potential benefits of the African information and communication infrastructure.

Scientific and Cultural Organization (UNESCO). Prior to that, similar workshops were held in Dakar, Senegal (for francophone West and Central African countries, November 1997) and Tunis, Tunisia (for North African countries, June 1997). A national training workshop was held in Ile-Ife, Nigeria in January 1999. Two others are scheduled in August 1999—in Antananarivo, Madagascar, for Indian Ocean countries, and in Nairobi, Kenya, for Eastern African countries.

Delivering Telemedicine to Remote Areas. Investment in ICTs for the health sector in Africa can help meet pressing health needs. Potential applications include health administration enhancement, health sector connectivity, and a decision-support system for curative and preventive health, improved distribution, and reduced cost of medical supplies. Basic applications of information and communication technologies to the health sector include electronic medical records, hospital information systems, the setup of intranets for sharing information among related participants in health institutions, the use of public networks such as the Internet to distribute information, decision-support expert systems, the provision of remote diagnostics via telemedicine, and community health information systems for local, national, and regional health planning.

In addition to promoting overall use of ICTs in the health sector through advisory services,

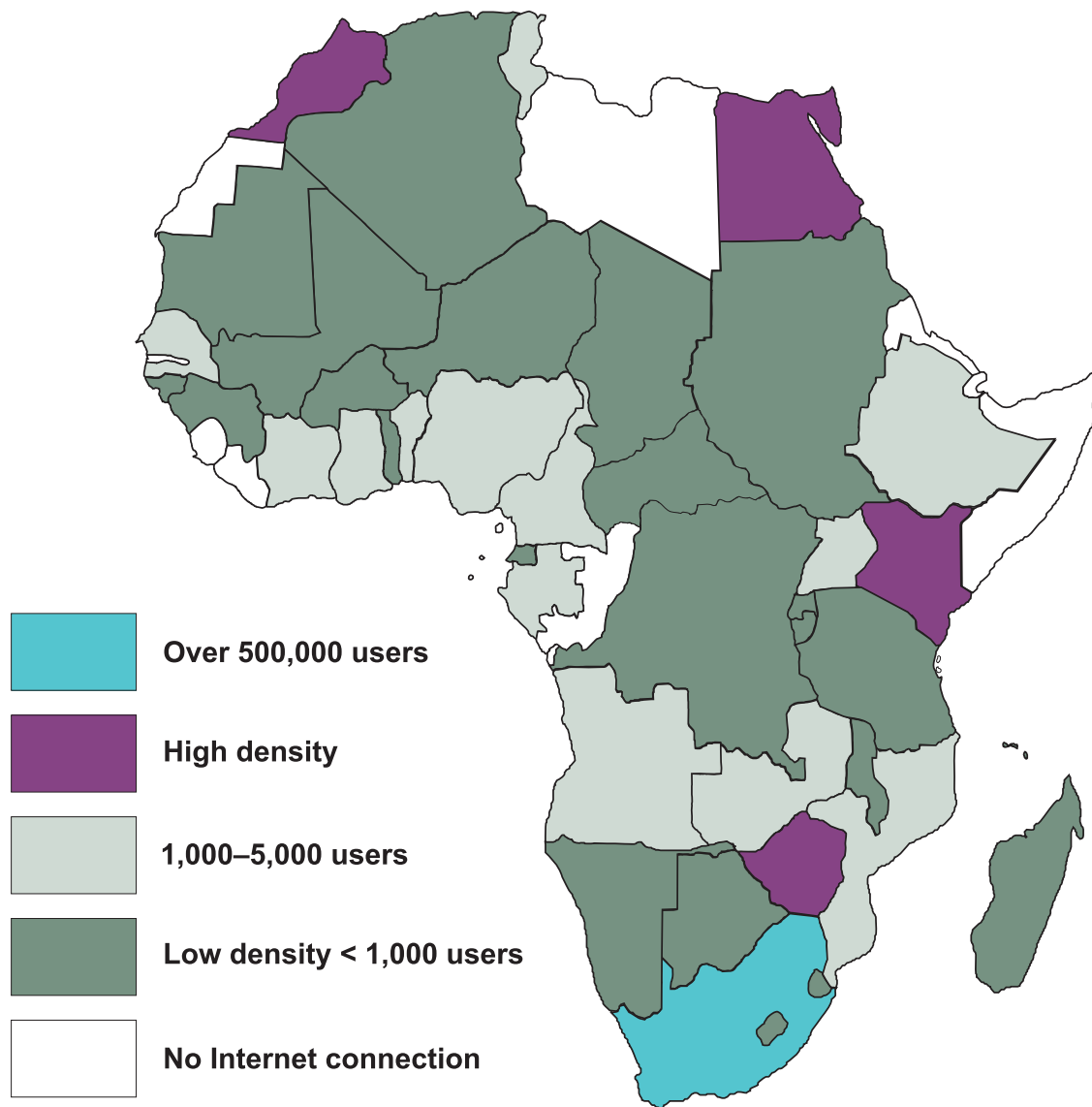
ECA's activities have included co-sponsoring a recent Telemedicine Conference for the Arab World, Africa, and Europe in Tunis in October 1998. The workshop focused on sharing experiences and disseminating the telemedicine concept widely. As a result of the Tunis conference, and in collaboration with the Africa Telehealth project, ECA held a regional workshop on telemedicine in Nairobi in February 1999. The workshop was intended to lay the foundation for the creation of five subregional telemedicine centres—in Ethiopia, South Africa, Ghana, Tunisia, and Senegal.

Developing Content and Promoting Local Knowledge. Information about Africa (or African content), on the Internet is insignificant and of variable quality, lacks the required focus and standardization, and is too widely dispersed. Content flow is largely unidirectional—from the developed countries of the north to Africa. Making existing African content and local knowledge accessible via ICTs is an important means towards improving the availability of information and ideas intraregionally, as well as of enhancing Africa's contribution to global information resources, thereby presenting more holistic and authentic images of the continent. Increased business content can contribute to Africa's economic growth. Also, global content needs to be packaged so as to be user-friendly to different African communities.

ECA has been active in the development of content since the establishment of the Pan-African Development Information System (PADIS) in the 1980s. The evolution of development information systems from the traditional centralized model to a distribution-based model has prompted new approaches to content development in Africa.

ECA's advisory services have offered training in web site construction in Tanzania, in its five sub-regional offices, and to a number of subregional institutions such as the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC). Current and future ECA activities in content development

Figure 8. Internet Connectivity and Net Density in Africa



Based on: <http://www3.wn.apc.org/>, www.nsrc.org, www.nw.com

within the framework of the AISI include training in content development, maintaining an inventory of Internet content to monitor its growth and to provide incentives, and creation of a clearing house for social and economic development content in Africa.

Electronic Commerce. The potential role of electronic commerce in reducing the distance between remote centres of production, lowering inventory and procurement costs, and attracting sales and stimulating real-time marketing is tremendous. This potential is, however, threatened by a dearth of public-private sector partnerships, uncompetitive pricing policies, and concerns about privacy. In addition to global concern about the security of financial transactions on the Internet, regulatory issues involving taxation, contract law, customs clearance procedures, and differing payment practices remain major barriers in Africa. Inadequate IT skills also mitigate against the growth of electronic commerce on the continent.

To address these problems, ECA is promoting new models of electronic commerce that are affordable for small and medium-scale enterprises (SMEs) and governments. These models are being designed for their capacity to adapt to and influence regulatory frameworks, and for their ability to promote collaboration among industry, local enterprise, and governments. ECA is working with the United Nations Conference on Trade and Development (UNCTAD) and its Partnership in Communication Technologies for Africa (PICTA) partners to build electronic commerce sites in selected African countries, through local chambers of commerce and investment promotion centres. One example of this collaboration is an Arab regional workshop on Electronic Commerce, organised by UNCTAD with ECA participation, in Cairo in September 1998.

“To move into the Information Society, Africa must be clear on what it wants and make its desires clear to others. If we are clear, if we have a compelling vision for ourselves, then it is likely that our choices will turn into our own reality. If we are not clear, then we will either be perpetual observers of the information highway or find ourselves on a road not fit for our needs.” *K.Y. Amoako, from “Information and Communications for Development—Keynote Address before the Luncheon Forum, Conference on the Information Society and Development”, Midrand, South Africa, 14 May 1996.*

Such work involves establishing SME networks, Internet-accessible databases on business opportunities, electronic commerce workshops and training, needs assessment, and modalities and guidelines.

Strategies to Ensure Women’s Access to IT.

Although women are a powerful force in development, they have by and large been excluded from the design, development, and use of ICTs, which remain male-dominated. Women entrepreneurs, who by their sheer effort sustain a large number of families in Africa, are still using traditional techniques to manage their businesses. What is more, the number of women involved in advanced education in computer and information sciences as well as engineering is woefully low, with some countries witnessing a contraction in the number of women computer science graduates.

To address these and other related issues, ECA’s 40th anniversary conference on African women and economic development (see box 5) included among its core discussion points the theme of “African Women and the Information Age”. To implement the recommendations from

this conference, and in line with its work programme in this area, the Commission is planning to promote women’s participation in advanced computer studies, stage national workshops for women entrepreneurs, and foster the involvement of

women in running and managing community centres. Another outcome of the conference is the launch of a task force on gender dimensions in national accounts, led by DISD and involving other programme divisions of ECA. Among partnerships in the field of electronic networking for sustainable development, ECA is working with the Association for Progressive Communications (APC) to broaden access to and ownership of low-cost

Box 12. "Global Connectivity for Africa"

In what was the first regional follow-up to the June 1997 Global Knowledge Conference in Toronto, Canada, "Global Connectivity for Africa" brought together more than 400 stakeholders, including some 30 African communications ministers, to discuss improved access to national networks, lower prices for international calls, and the broadening of access to information.

The conference, which took place in Addis Ababa, Ethiopia, 2–4 June 1998, was hosted and sponsored by ECA, along with the World Bank Group, the Information for Development Programme of the International Telecommunication Union (ITU), the African Development Bank (ADB) and the Government of the Netherlands. The WorldSpace Corporation, Siemens, Teledesic, RASCOM, and Iridium co-sponsored from the private sector.

The three-day conference examined a wide range of cable and satellite projects, and, recognizing the increased choice of technology currently available, called for systematic reviews of sector policies and regulatory arrangements in order for the continent to take full advantage of the evolving situation.

The gathering underscored the need for cementing partnerships within the region, and in that context, ECA expressed its willingness to provide regular forums for

African communications ministers to meet and maintain the momentum on the positive dialogue to date, as well as to monitor progress in the development of the African Information Society Initiative.

Recommendations called on governments to regularly review sector policies and regulatory arrangements to optimize the benefits available from the increased choice of technology. In the light of the affordability barrier to ICT access, regulatory intervention was also deemed necessary to ensure consumers benefit from the reduced cost of international access. It was felt that connectivity projects should be undertaken primarily by the private sector, and that opportunities should be created to allow local financial participation, including micro-credit facilities in rural areas. Ministers were asked to introduce policies to address the Year 2000 (Y2K) computer malfunctioning problem, also known as the "Millennium Bug". As part of its follow-up to the conference, ECA produced a briefing paper on the Y2K problem for African policy makers. The briefing paper outlines the problem itself, details major aspects that will affect Africa, offers practical solutions, and includes best practices in dealing with the problem in Africa. In addition, it provides an extensive set of electronic and hard-copy information resources on the Y2K problem.

communication technologies for women and others most affected by poverty.

Building Coalitions with the Private Sector.

There is a consensus that the private sector has a critical role to play in developing national information infrastructure and related technological innovations in Africa. A key ECA partner in this regard is the Global Information Infrastructure Commission (GIIC), which serves a unique and very significant purpose in bringing business perspectives to the forefront wherever a global dialogue is needed between leaders of the public and private sectors to accelerate the development of the Information Society in Africa. A regional GIIC arm (GIIC-Africa) was established in May 1998 in Johannesburg, South Africa, to advocate policies in favor of the GII/GIS, champion pilot programmes to aid Africa's development, and fi-

nance the building of the information infrastructure and information society. It is expected that GIIC-Africa will leverage its strategic relationships with ECA to foster information infrastructure development and encourage investment in ICTs in Africa. In recognition of this partnership, the ECA Executive Secretary was recently named an Honorary Commissioner.

Another important private-sector partner is the WorldSpace Corporation, which emphasizes democratization of access to information, and is championing strategies to disseminate alternative voices and alternative perspectives through its non-profit arm, the WorldSpace Foundation. In December 1998, together with its manufacturing partners—Hitachi, JVC, Matsushita (Panasonic), and Sanyo—WorldSpace Corporation unveiled digital satellite radio receivers in Africa and the Middle East in early 1999. In response to the im-

pediments of large distances and physical barriers inside African countries that result in most African communities being isolated from the information revolution, WorldSpace is building an infrastructure that will bring information to local people using satellite radio from the AfriStar satellite, which was launched recently.

ECA is also establishing a Technology Centre for Africa (TCA) to raise the awareness of African policy and decision makers on the importance of the Information Society, as well as to provide both the policy and the technical tools necessary to develop the Information Society in their respective countries. The TCA, to be established in the UN Conference Centre in Addis Ababa, Ethiopia, will provide opportunities for policy makers to see, understand, and educate themselves as to how technology can assist in meeting their development objectives. It will also provide focused training for both policy makers and implementers and thereby contribute to the application of technology in relevant areas, ensuring that the necessary knowledge is in place before new technologies are introduced. The TCA will consist of a standing Technology Exhibition demonstrating sector applications of relevance to African economies and societies, and a Training Centre offering courses in information and communication technologies. ECA is seeking the active participation of the private sector in financing and operating the TCA.

Developing Statistics and Geo-information.

African statistical development is in a poor state, representing a serious impediment to economic and social progress. Africa's capacity to access and contribute to global knowledge must be built on a system of timely, reliable, and easily accessible data at the national level. At the same time, the need for geo-information has increased rapidly over the years as an essential input for land management systems. Geo-information, the images created when digital maps are linked to databases, can be a helpful tool for a wide range of applications, such as remote sensing and environmental, agricultural, and infrastructural planning.

ECA acts as Secretariat to the inter-agency CASD, which was set up in 1992 on request from Member States to coordinate all activities to promote Africa's statistical development. ECA support to CASD falls into four categories: support for coordination meetings, assistance to CASD's four task forces, promoting the flow of information, and establishing a baseline statistical programme for Africa. ECA is the task leader of three CASD task forces—on connectivity for statistics, monitoring implementation of the Addis Ababa Plan of Action, and strengthening Statistical Training Programme for Africa (STPA) centres.

In collaboration with other partners, ECA has designed a three-year program for implementation with partners, starting in 1999, to help member countries to:

- Strengthen statistical training;
- Strengthen and refine the process for further implementation of the 1993 System of National Accounts;
- Establish national and regional standardized micro-data libraries;
- Strengthen needs assessment, statistical operations, and data analysis and dissemination capabilities;
- Develop integrated household survey capabilities;
- Develop an environmental statistics capability;
- Strengthen statistical database capabilities; and
- Improve the coordination of statistical activities in Africa in the CASD framework.

ECA has also been promoting geographic information for more than three decades in its efforts to assist Member States to improve their management of natural resources and their stewardship of the environment. Recent activities include an ad hoc experts group meeting on "Integrated Geographic Information Systems, with Special Attention to Cadastre and Land Information Systems for African Decision-Makers", held in November 1998. The meeting emerged with recommendations on improving existing systems in African countries, and developing new ones.