



*Profiles of
Electronic Networking Initiatives in Africa*

by

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Health and Human Resources Analysis for Africa (HHRAA)
USAID, Africa Bureau, Office of Analysis, Research and Technical Support*



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Foreword

The Support for Analysis and Research in Africa (SARA) component of the USAID Africa Bureau's Health and Human Resources Analysis for Africa (HHRAA) project has a responsibility to "research, develop, test, implement, and evaluate dissemination mechanisms in Africa, and to identify the most appropriate dissemination strategies for research and analysis activities." The HHRAA/SARA research and analysis activities are in the areas of health, nutrition, population, and basic education in sub-Saharan Africa.

SARA looks for appropriate **channels** through which to reach a variety of audiences with information that can contribute to the knowledge base necessary for informed decision making in Africa's social sectors.

Of particular interest to SARA are channels that stimulate and enhance two-way sharing of information, particularly within sub-Saharan Africa itself. For this reason, SARA undertook to assess the extent of electronic networking activities in Africa, and to identify initiatives that involve African institutions themselves. SARA's interest is in the potential to work on information dissemination with local institutions that are using electronic communications and whose focus and experience reflect those of the HHRAA project.

The *Profiles* in this document reflect this interest. Many more electronic efforts are underway on the continent at this time than are included here. Through the efforts of many organizations and individuals, the technology is being brought to bear on difficult communication environments. African users are finding their way onto the systems and are making the technology work for them. SARA's aim is to encourage and facilitate the electronic sharing, among African institutions, of their own work, ideas, and experiences.

I. Introduction

This report presents profiles of major electronic networking initiatives that have been undertaken in Sub-Saharan Africa. The focus is on institutions and organizations engaged in the development of electronic networking in Africa, in other words, who is doing what and where. The “how” of electronic networks—information and communication technologies and telecommunications infrastructure—is not a primary topic of this report. The issues of technology and infrastructure are, of course, central to the building of networks. However, the purpose of this research was to identify the current applications and potential for electronic networks in Africa as vehicles for information dissemination. The profiles are intended to provide an introduction or starting-point for organizations and individuals with little or no prior experience in electronic networking in Africa. The contact information and references included for each profile are the sources for detailed information on the technical aspects of network implementation.

As a general statement on the technologies being used in African electronic networking, it can be said that innovative solutions are being applied that allow networks to function in difficult communications environments. Also, as the telecommunications infrastructure is upgraded (which is being done in many countries), networks will be taking advantage of the new opportunities presented. Most of the networks profiled in this report use Fido-based technology. Fido software and systems were originally developed in the United States as a low-cost, efficient means for electronic communications; Fido users developed the network known as FidoNet, which currently links over 15,000 Fido systems worldwide. Many of the major supporters of electronic network development in Africa have concluded that Fido-based technology is the most viable option for initiating African networks.

In addition to the profiles presented in this report, the following organizations and activities require special mention:

1. The *International Development Research Centre (IDRC)* of Canada has played a lead role in the support of electronic networking in Africa. This support is a natural outgrowth of IDRC’s longstanding commitment

to the development of African information networks (a term that encompasses a far broader concept than electronic communications networks).

2. The *American Association for the Advancement of Science (AAAS)* Sub-Saharan Africa Program supports activities to improve information access for scientific and technical researchers in Africa. A project for African research libraries that includes CD-ROM, journal distribution and strengthening institutional capacity components, is complemented by a project for enhancing electronic access to information.

In August 1992, the AAAS Sub-Saharan Africa Program and the African Academy of Sciences, with the support of the Carnegie Corporation of New York, organized the "Workshop on Science and Technology Communication Networks in Africa" which was held in Nairobi. The proceedings of that workshop were a major source of information for this report. The summary report of the workshop is a document that should be of interest to donors considering funding electronic networking initiatives as it provides a general overview of the situation of electronic networking in Africa and concisely presents the policy and technical issues that emerged from a comparison of network project experiences. These issues are human resource development and training; costs, marketing, and sustainability; leadership and participation; hardware and software applications.

The AAAS Sub-Saharan Africa Program organized a second workshop on electronic networking that was held in Accra in December 1993. The proceedings of that workshop will be published in 1994. Also planned for publication is a *User's Guide to Electronic Academic Research Networks in Africa*.

3. The *U.S. National Research Council's Board on Science and Technology for International Development (BOSTID)*, as part of its ongoing development information activities, has been carrying out a project to investigate the means by which information services and technologies can enhance the quality and quantity of scientific research in Africa. The project is supported by the Carnegie Corporation of New York and

is being carried out in collaboration with the African Regional Centre for Technology (ARCT).

BOSTID and ARCT have examined and worked with Carnegie-funded science and technology information (STI) pilot projects in Africa. A proposal by the group of pilot projects to launch a formal network has been studied and the conclusion reached that the priority need is to further strengthen institutional STI capacities to ensure the sustainability of the future network. Discussions on the proposed network also concluded that an initiative was required to respond to the often uncoordinated approach to the application of information and communication technologies in Africa. Therefore, BOSTID and ARCT will publish a series of case studies that will present lessons learned from STI projects in Africa. A companion publication series will be "Technology Fact Sheets," which are intended to provide guidance for the selection of information and communication technologies.

4. The *Association for Progressive Communications (APC)* is a global partnership of computer networks with a commitment to providing low-cost computer communications services to individuals and organizations working in environmental, social justice, and development activities. APC has provided substantial support to electronic networking in Africa through its London-based member GreenNet, which is the primary hub for African internodal communications. (Most of the e-mail addresses listed in this report carry the suffix "gn.apc".)

Another APC member, NirvCentre/Web, with assistance from IDRC and Partnership Africa Canada, has organized meetings on African electronic networking. The "Global Networking Workshop" was held in Toronto in February 1992 and the "Southern African Regional Networking Workshop" took place in Johannesburg in July 1993. NirvCentre is also implementing an IDRC project to upgrade and expand the software used for communications and management by most African electronic networks.

5. *Baobab Communications* is a privately held company that has provided technical assistance in setting up a number of African electronic networks. The company's electronic bulletin board, THE BAOBAB,

specializes in Africa-related communications issues and was the source of a substantial amount of information for this report.

There are, most certainly, more organizations and individuals involved in African electronic communications than are covered in this report. Omission of any particular activity should not be considered a judgement of lack of importance. The criteria for inclusion in this report was that electronic communications capability is being applied to either a network based in Africa or a global network with a distinct African sub-component. In the long-term future of interconnectivity, these lines of distinction will lose their importance and fade. Presently however, the networking initiatives profiled here are paving the way for full African participation in an on-line world.

Introduction Reference Notes

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Electronic Networking in Africa. A Summary Report of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya. Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992.

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Sources:

Model Science and Technology Information Networks in Sub-Saharan Africa. Report of a Feasibility Study Carried Out by a Panel of the Board on Science and Technology for International Development, National Research Council. Washington, DC, National Academy Press, 1993.

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Sources:

Association for Progressive Communications (APC) Map of Nodes and Connected Systems. July 1993.

Mikelsons, Arni; Jensen, Mike. **Report of the Southern Africa Regional Networking Workshop, June 29–July 2, 1993, Johannesburg, South Africa.** Toronto, NirvCentre, 1993.

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Jensen, Mike; Sears, Geoff. **Low Cost Global Electronic Communications Networks for Africa.** Paper prepared for the panel on Electronic Bulletin Boards and Computer Networks: Africa and African Studies

in the Information Age. 34th Annual Meeting of the African Studies Association, St. Louis, Missouri, November 23–26, 1991.

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II. Africa-wide and Regional Electronic Networking Initiatives

1. *HealthNet*

HealthNet was created and is managed by SatelLife, an NGO that receives support from a diverse group of foundations, corporations, and individuals as well as IDRC. The purpose of the network is to provide communication and information access for health workers in developing countries. While the network is sector-specific (although broadly defined), a comprehensive approach has been taken in its development, including

identifying, developing and providing appropriate technology to physically build the network; two dedicated microsattellites (HealthSat I and II) link low-cost communications ground stations that consist of a microcomputer, radio, and antenna;

addressing and acting upon policy, regulatory, administrative, and management issues;

supporting the development of genuine health information networks that encompass rural-urban information flows within individual countries as well as regional and international information exchange and dissemination;

cooperating extensively with other electronic networking projects in Africa.

Since its creation in 1990, the HealthNet initiative has focused on Africa. As of February 1994, HealthNet ground stations have been installed and are operating:

- ◆ in East Africa—Ethiopia, Kenya, Sudan, Tanzania, Uganda;
- ◆ in Southern Africa—Mozambique, Zambia, Zimbabwe;
- ◆ in West and Central Africa—Cameroon, Congo, Gambia, Ghana, Mali.

In addition, licenses have been obtained and installation is planned in Eritrea, Botswana, Malawi, and Nigeria. (HealthNet sites outside of Africa include Brazil, Cuba, Philippines, Australia, Canada, and the U.S. headquarters of SatelLife.)

There is a robust exchange of information occurring on HealthNet and health literature is being disseminated to a wide range of users. The following are components of the HealthNet Information Service:

“Dialogue for Health” is a communications forum for health care personnel to request and exchange information with their colleagues in Africa and worldwide.

“Interactive Publications for Health” disseminates several full-text publications to network users, including WHO LIBRARY DIGEST, AIDS BULLETIN, MATERNAL AND CHILD HEALTH BULLETIN, and DIARRHEA DIALOGUE. Also, medical librarians using HealthNet in Africa have developed an electronic bulletin (AFRICAN MEDICAL LIBRARIANS BULLETIN), which they issue monthly to support regional and international information exchange.

“Library Partnership Program” links libraries in Africa with international partners for research and reference service, document delivery and information exchange. Examples of partnerships are

University of Zambia Medical Library and
University of Florida Health Science Center Library;

University of Ghana Medical Library and
Emory University Health Sciences Center Library;

Mozambique National Institute of Health Documentation Center
and Cornell University Medical School Library and
Oswald Cruz Institute of Brazil.

In addition to international and regional linkages, there have been some significant efforts to extend HealthNet coverage within individual countries. For example,

- ◆ In Zimbabwe, several district hospitals in the Midlands Province are using HealthNet to transmit epidemiological data to the Provincial Medical Office where it is analyzed and the report transmitted back to the hospitals. This information flow has improved monitoring of specific health problems in the province.
- ◆ In Zambia, a pilot project is being carried out in the Southern Province using HealthNet to link several district hospitals for clinical consultation, distance learning, health literature dissemination, epidemiological data exchange, drug supply, and management information. The project is monitoring the use and performance of the network; the results will provide the basis for extending the network throughout Zambia.

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2. PADIS Electronic Networking Initiatives

The Pan African Development Information System (PADIS) was established by the U.N. Economic Commission for Africa in 1980 with the purpose of providing assistance to develop national capacities in information collection and dissemination and also to promote information exchange throughout Africa. IDRC has provided major support for PADIS activities.

The approach PADIS has taken to electronic networking is built upon its experience in developing a continent-wide information network, which currently includes 39 national centers and 43 sub-regional and regional institutions. These participating centers serve as focal points for PADIS technical assistance (e.g., in organizing national scientific and technical information networks), provide input to the PADIS databases (reference and statistical), and receive information products generated by those databases. PADIS therefore had a substantive, organized body of information ready for electronic network applications. The first PADIS electronic network, PADISNET, began in 1990 as a pilot effort for e-mail, conferencing, bulletin boards, and on-line searching. It was designed as a “network of networks” project and covers 15 countries.

Problems identified and lessons learned from PADISNET and several other IDRC-funded pilot projects were used to develop the most recent PADIS initiative, “Capacity and Infrastructure Building in Electronic Communications in Africa” which is known as CIBECA. The major activities proposed for this project are

- ◆ training, both system operators and users;
- ◆ promoting awareness on the use of electronic networks;
- ◆ supporting the development of user groups;
- ◆ providing connectivity;
- ◆ providing reference and research services on electronic network technologies.

The project has received seed funding from IDRC and is set up to accommodate multi-donor participation and also the institutional “purchase” of project services (expertise, software, support, and training).

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The Pan African Development Information System—PADIS. Addis Ababa, UNECA PADIS, 1991.

3. *ESANet: Eastern and Southern Africa Network*

Funded by IDRC for the period 1991–93, ESANet was a pilot project that intended to investigate and evaluate the technical aspects of electronic networking in the region, with the long-term goal of promoting communication within the region's research community.

The implementing agencies for the project were the computer centers of the University of Nairobi, Makerere University, University of Dar es Salaam, University of Zambia and the University of Zimbabwe. Several NGOs were also involved in the project: SatelLife and VITA provided assistance in packet radio and satellite communications; APC and ELCI provided software and training for the project component that utilized local telephone lines for network communications; links to international networks are made available through the GreenNet gateway.

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Sources:

Gebrehiwot, Abraham. **Status of Networking Initiatives in Africa**. Pisa, CNUCE, RINAF Project, 1992.

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4. *NGONet-Africa: Non-Governmental Organizations Network for Africa*

The purpose of this two-year IDRC project (1991–92) was to initiate an electronic network of NGOs by installing nodes in each of the four major regions of Africa. The project provided support to two previously established nodes to strengthen their regional functions: for East Africa, at ELCI/Kengele (Environment Liaison Centre International) in Nairobi and for Southern Africa at MANGO (Microcomputer Access for NGOs) in Harare. The new nodes initiated were for West and Central Africa, at ENDA in Dakar and for North Africa, at ENDA InterArabe in Tunis.

In addition to the regional nodes, the project also supported the development of ZANGONet, a national network of NGOs in Zambia.

ELCI played a major role in training participants in this and other IDRC-funded electronic network projects. ENDA has been providing software and training for various organizations in West Africa. MANGO and ELCI carried out research on financial sustainability of the network by experimenting with users fees, with a goal of raising 70 percent of operating costs.

Additional information on *NGONet-Africa*:

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[See the profiles for Zambia and Zimbabwe for ZANGONet and MANGO contact information.]

Sources:

Mikelsons, Arni; Jensen, Mike. **Report of the Southern Africa Regional Networking Workshop, June 29–July 2, 1993, Johannesburg, South Africa.** Toronto, NirvCentre, 1993.

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African Environmental-NGO Electronic Networking Node Development.
[IDRC Project Profile, IDRIS Database File 90-0141]

5. *ARSONet: African Regional Organization for Standardization Network*

The African Regional Organization for Standardization (ARSO) is an inter-governmental group established in 1977 to promote standardization, quality control, certification, and metrology.

IDRC provided initial support to the ARSO Secretariat for an information clearinghouse on standards. A subsequent IDRC project supported the development of an information network for the standards bureaus of ARSO-member countries. One aspect of this project was to initiate an electronic network to provide selected standards bureaus with e-mail, conferencing, and file transfer capabilities. The standards bureaus of Kenya, Ethiopia, Senegal, Tunisia, and Egypt are linked through ARSONet.

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Sources:

African Standards Documentation Network. [IDRC Project Profile, IDRIS Database File 89-0025]

Capacity-Building in Electronic Communications for Development in Africa. [Project Proposal] Addis Ababa, UNECA PADIS, 1993.

Gebrehiwot, Abraham. **Status of Networking Initiatives in Africa.** Pisa, CNUCE, RINAF Project, 1992.

6. *ARCTIS: The African Regional Centre for Technology Information System*

The African Regional Centre for Technology (ARCT) was established in 1980 under the auspices of the U.N. Economic Commission for Africa, with the support of UNDP, IDRC, and ARCT-member states. The Centre is carrying out research with BOSTID on scientific and technical information projects in Africa.

The ARCT information system, ARCTIS, functions as both a system and a network; it promotes information exchange and supports electronic networking of industrial, technical, and R&D national institutions.

Specific electronic networking initiatives include

- ◆ AfricanTIES, the regional component of UNIDO's global Technological Information Exchange Network;
- ◆ INTIB Africa Subnetwork, the Industrial and Technological Information Bank;
- ◆ Food Technology Information Network.

ARCTIS also supports research and reference services through on-line searching of major databases in Europe and the United States.

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of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya. Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 139–44.

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7. ***FEWS Network: Famine Early Warning System Project Network***
SAFIRE Network: Southern Africa Food Information and Resource Exchange Network

These complimentary projects, which were set up to monitor drought conditions and food supplies and to support the coordination of assistance, are funded and administered by USAID. SAFIRE is a joint initiative of USAID and the U.N. World Food Programme. The networks provide e-mail, file transfer, and conferencing services through store-and-forward systems with hubs located at USAID headquarters and project contractors' offices in the Washington, DC, area.

The FEWS Network has sites in 10 African countries: Burkina Faso, Chad, Ethiopia, Kenya, Malawi, Mali, Mauritania, Niger, Zambia, and Zimbabwe.

The SAFIRE Network has sites in six countries: Malawi, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe.

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Sources:

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Glaser, John. **SAFIRE Report: Follow-up Visit to Mozambique, Zimbabwe, South Africa and Tanzania, March 1 to April 1, 1993.** Washington, DC, A.I.D. Africa Bureau, 1993.

8. *VITA Electronic Networking Initiatives*

Volunteers in Technical Assistance (VITA) is an NGO that is generally recognized as the pioneer organization in the application of communication and information technologies to support development and humanitarian assistance activities.

VITACOMM is the organization's global communications program. It consists of three, interconnected components:

- ◆ VITASAT, a low-earth orbiting satellite system;
- ◆ VITAPAC, a terrestrial digital radio system;
- ◆ VITANET, an electronic message delivery system that uses existing telephone networks.

In Africa, VITACOMM provides support to the following activities:

- ◆ Chad, private enterprise development project;
- ◆ Djibouti, national research institute development project;
- ◆ Ethiopia, refugee administration;
- ◆ Ghana, distance learning project;
- ◆ Kenya, private enterprise development project;
- ◆ Madagascar, environmental preservation project;
- ◆ Sierra Leone, community development project;
- ◆ Somalia, relief administration;
- ◆ Sudan, relief logistics and a rural development project;
- ◆ Tanzania, rural development project and health information;
- ◆ Zambia, private enterprise development project.

From its U.S. headquarters, VITA issues the monthly electronic newsletter "DevelopNet News" and maintains the on-line forum DEVEL-L.

Additional information on VITA networking initiatives:

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Sources:

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Garriott, Gary. **“Personal Computer-Based Communications Training: The Future in African Networking?”** In: Proceedings of INET’93—International Networking Conference, San Francisco, August 17–20, 1993. Reston, Virginia, The Internet Society, 1993.

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Dirieh, Djama. **“How a Packet Radio Communications System Has Served ISERT [Djibouti].”** In: Electronic Networking in Africa. Proceedings of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya. Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 71–74.

9. *CGNET: Consultative Group on Agriculture Network*

CGNET was developed by the Consultative Group on International Agricultural Research (CGIAR) to support information exchange among agricultural researchers and research centers.

During the network's pilot phase in the early 1980s, only one African center participated (ILRAD in Nairobi). There are currently network users in 18 African countries although most are international research centers rather than national institutions. High telecommunications tariffs have impeded the participation of national research centers in CGNET. The network is administered by CGNET Services International, a privately held company based in California; the host system is the U.S. commercial service Dialcom.

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10. RINAF: Regional Informatics Network for Africa

Officially launched in February 1992, RINAF is a project of UNESCO's Intergovernmental Informatics Programme (IIP) and is part of a worldwide initiative that also includes RINSCA (Southern and Central Asia), RINAS (Arab States), and RINEE (Eastern Europe).

Start-up funding for RINAF has been provided by the Italian government.

The emphasis of the RINAF project is on the technical aspects of connectivity with the goal of establishing links between academic and research institutions within Africa and between Africa and the rest of the world. The initial objectives of RINAF included reviewing the status of the telecommunications infrastructure in each country; developing appropriate electronic communications approaches based on the technology and infrastructure available in each country; organizing electronic communications systems; training system operators. To meet the training objective of the project, RINAF has organized courses and also financed African participation at international conferences such as the INET meetings.

The first phase of project implementation provides for the establishment of RINAF nodes in eight countries. In addition to Algeria and Egypt, nodes are planned for

- ◆ Kenya (NCST, the national research council);
- ◆ Swaziland (University of Swaziland Computer Center);
- ◆ Zambia (University of Zambia Computer Center);
- ◆ Guinea (University of Conakry Computer Center);
- ◆ Nigeria (National Center for Technology Management);
- ◆ Senegal (CNDST, the national research council).

Kenya, Senegal, and Zambia are designated as regional nodes, intended to provide inter-African and international links and be responsible for network maintenance and training. Guinea, Nigeria, and Swaziland are the planned initial national nodes charged with organizing and implementing their own national networks.

The project coordinating office, which is located at an institute of the Italian national research council, maintains the on-line forum RINAF-L.

Additional information on RINAF:

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Sources:

RINAF Implementation Plan. Pisa, CNUCE, RINAF Project, 1992.

Abba, L.; Giordano, S.; Trumpy, S. **“RINAF: A Network Interconnection Project of Academic and Research Institutions in Africa”**. In: *Electronic Networking in Africa. Proceedings of the Workshop on Science and Technology Communication Networks in Africa*, August 27–29, 1992, Nairobi, Kenya. Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 11–24.

11. RIONET: Réseau Informatique de l'ORSTOM

The French scientific research agency ORSTOM began development of this network in 1988. The primary purpose of RIONET is to link the research laboratories of ORSTOM and its partner institutions and provide users with Internet access. The RIONET initiative also includes the goal of promoting the development of national research networks; the participant base is being expanded to include research institutions and universities that are not formal ORSTOM partners and also NGOs.

RIONET is run on UNIX systems and provides e-mail, file transfer, and conferencing services. In Africa, nodes have been installed at ORSTOM offices in Burkina Faso, Cameroon, Congo, Cote d'Ivoire, Madagascar, Mali, Niger, Senegal, and Togo.

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Sources:

RIONET in Africa and the Indian Ocean. Paris, ORSTOM, July 1993.

Renaud, Pascal. **RIO Network.** Paris, ORSTOM, February 1993.

“RIONET. An International Computer Network for Scientific Research in Africa.” In: *Electronic Networking in Africa. Proceedings of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya.* Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 145–53.

12. SDN: Sustainable Development Network

This is a UNDP initiative for the support of global electronic networking. Among the proposed SDN sites in Africa are Angola, Namibia, and Zambia.

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Sources:

Mikelsons, Arni; Jensen, Mike. **Report of the Southern Africa Regional Networking Workshop, June 29–July 2, 1993, Johannesburg, South Africa.** Toronto, NirvCentre, 1993.

13. AFRINET: African Research Information Network

AFRINET is a proposal of the African Academy of Sciences (AAS) and its related organization, the Network of African Scientific Organizations (NASO).

A preliminary project outline was developed in collaboration with California State University, which sought to extend into Africa a VAX computer-based network known as BESTNET. The BESTNET project, supported by the Digital Equipment Corporation, originally linked students and faculty at universities in the United States and Mexico for on-line course seminars, faculty research conferencing, and library databases. Initial project sites proposed in Africa were the University of Nairobi and the University of Zimbabwe.

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Sources:

Kone, Iba. "**Network of African Scientific Institutions**". In: *Model Science and Technology Information Networks in Sub-Saharan Africa*. Report of a Feasibility Study Carried Out by a Panel of the Board on Science and Technology for International Development, National Research Council. Washington, DC, National Academy Press, 1993, p. 59.

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III. National Electronic Networking Initiatives

1. *Ghana*

The Ghana Scientific and Technical Information Network (GHASTINET) began an electronic networking initiative in 1991 with the support of AAAS, IDRC, and PADIS. The long-term goal of the project is to develop a national research and academic network. Initially, the project sought to establish links between

- ◆ the three universities in Ghana (Cape Coast, Kumasi, Legon);
- ◆ the Council on Scientific and Industrial Research;
- ◆ the Technology Transfer Centre;
- ◆ the Association of African Universities.

The first phase of project implementation was constrained by infrastructure and technical problems; also, high telecommunications tariffs are an obstacle to inter-African and international connectivity.

Other network sites in Ghana: HealthNet.

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Sources:

Amissah-Arthur, Matilda. "GHASTINET's Experiences with E-Mail". In: *Electronic Networking in Africa. Proceedings of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya.* Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 37–40.

Villars, John. **"Status Report on Electronic Mailing in Ghana."** In: Electronic Networking in Africa. Proceedings of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya. Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 167–76.

2. *Guinea*

The development of electronic networking in Guinea is being promoted by Guinea*Access, a privately held company based in Conakry that was established in response to the restructuring and privatization of the telecommunications sector that began in 1992.

Guinea*Access is developing products and services in data communications, information distribution and, through its planned Institute of Digital Technologies, R&D, education, and training. The communications network, GuiNet (a trademark of Guinea*Access), intends to offer a range of communications systems options that will support e-mail, file transfer, and connections to international databases. The company is also building its own database that covers an extensive variety of topics including health, environment, economic, trade, scientific, technical, and socio-cultural information, either derived from or relevant to Guinean society.

The comprehensive goal of Guinea*Access is to provide communications and information services to support national development. The prospective customer-base includes both urban and rural areas; the company intends to develop linkages between the business sector and social development initiatives by brokering deals for multiple-use communications system installations.

Guinea*Access is a prototype for a broader private enterprise initiative incorporated under the name Afriq*Access which is examining, as an initial service offering, the development of an electronic network for the West African regional economic organization ECOWAS.

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Sources:

Guinea*Access [Prospectus]. Conakry, Guinea*Access, 1993.

3. *Kenya*

The Kenya Computer Institute (KCI) is the national computer society. In 1991, the international chapter of KCI launched KCI-NET, a global electronic network linking Kenyan nationals who are information technology specialists. The network supports the objective of the computer society, which is to promote the development and use of information technologies in Kenya and throughout Africa.

In 1993, KCI established the African Regional Centre for Computing (ARCC), which is developing a roster of volunteers with expertise in network technologies. These experts are intended to form the basis for the proposed African Academic Research Network Foundation (AARNEF), which would provide coordination and technical assistance for electronic networking initiatives throughout Africa.

ARCC is currently providing e-mail and conferencing services to a diverse user group. Direct Internet access was anticipated by late 1993.

Other network sites in Kenya include ARSONet, HealthNet, ESANet, NGONet-Africa.

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4. *Mozambique*

Electronic network development in Mozambique is being implemented by the Center for Informatics at Eduardo Mondlane University. As an initial effort, an e-mail system is being installed for the country's universities; Internet access is provided through South Africa's UNINET-ZA (via Rhodes University).

Mozambique is a HealthNet site with the ground station located at the Faculty of Medicine of Eduardo Mondlane University. Expansion of HealthNet within the country was planned in 1993. Also, a proposal was drafted for providing electronic network services throughout the health sector. The proposed initiative would build upon and integrate the activities of the Center for Informatics and HealthNet in Mozambique.

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Sources:

Annis, Sheldon. **An Internet-Linked Information Environment for the Health Sector in Mozambique.** Concept Paper prepared for the Southern Africa Department, World Bank, September 1993. (Draft)

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5. *South Africa*

SAnoNet/WorkNet: This network was launched in 1987 by the Labour Economic Research Centre. It was initially conceived as a network for social justice and service NGOs but rapidly expanded to provide support to a wide range of users including organized labor, political parties, media organizations, and educational institutions throughout South Africa. The network's system has been periodically modified to respond to growing use and technological advances. In 1992, with funding from CIDA (the Canadian International Development Agency), the network began a major upgrade that will allow for a direct Internet connection.

Within the region, SAnoNet is linked with MANGO in Zimbabwe and also has users in Botswana, Lesotho, Malawi, Namibia, and Tanzania.

UNINET-ZA: This academic research network links South African universities and provides them with a direct Internet connection. UNINET-ZA also handles international electronic network communications for the University of Zambia and the University of Zimbabwe; there are additional links with universities in Lesotho, Malawi, Mozambique, Namibia, and Swaziland.

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UNINET-ZA
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6. *Tanzania*

Efforts to develop an electronic network in Tanzania have been coordinated by the Commission for Science and Technology (COSTECH). Infrastructure problems (power and phone lines) have presented obstacles to development of a national network. Initial links have been established with several institutions including

- ◆ National Food and Nutrition Centre (TFNC);
- ◆ National Institute for Medical Research;
- ◆ Muhimbili Medical Centre;
- ◆ University of Dar es Salaam;
- ◆ Eastern and Southern African Universities Research Program (EASURP).

A network node was installed at COSTECH through the NGONet Project. Other network sites in Tanzania include ARSONet, ESANet, HealthNet and PADISNet.

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Sources:

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7. *Uganda*

The focal point for developing electronic networking in Uganda is the Institute of Computer Science at Makerere University. The Institute has received support from the Intergovernmental Informatics Programme (IIP) of UNESCO for acquisition of equipment and training seminars. The Institute developed and manages MUKLA (Makerere University Kampala), the first network node installed in Uganda, with support from the ESANet project. Service is being provided to 190 sites throughout the country, each with an average of three users. Network users include research and education institutions, government and international agencies, NGOs, and businesses.

Other network sites in Uganda: HealthNet.

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Sources:

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Mugambi, Paul. **“Informatics Policy and Science and Technology Communication in Uganda”**. In: *Electronic Networking in Africa. Proceedings of the Workshop on Science and Technology Communication Networks in Africa, August 27–29, 1992, Nairobi, Kenya*. Nairobi, The African Academy of Sciences; Washington, DC, AAAS Sub-Saharan Africa Program, 1992, pp. 125–29.

8. *Zambia*

ZANGONet: This electronic network of Zambian nongovernmental organizations was launched in 1992 with the support of the IDRC project NGONet. The user base, which in 1993 included over 20 NGOs, has expanded to include a variety of social development projects and services. The network system is operated by the University of Zambia.

UNZA: The University of Zambia's e-mail network, UNZA, began providing service to the academic and research community in 1991. A single system managed by the University's Computer Centre provides service for the University itself as well as for ZANGONet and HealthNet sites in Zambia; the University is also an ESANet site. UNZA has developed proposals for expanding the network, upgrading services, and offering users an Internet link. South Africa's UNINET-ZA has provided support and services for a pilot effort to connect UNZA to the Internet.

HealthNet: HealthNet coverage within Zambia has been extended with a pilot project to link several district hospitals in the Southern Province for clinical consultations, distance learning, health literature dissemination, epidemiological data exchange, drug supply and management information. Use and performance of the network during this pilot is being monitored and the results will provide the basis for extending HealthNet to all of the provinces.

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Sources:

Mikelsons, Arni; Jensen, Mike. **Report of the Southern Africa Regional Networking Workshop, June 29–July 2, 1993, Johannesburg, South Africa.** Toronto, NirvCentre, 1993.

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9. *Zimbabwe*

MANGO: The Micro-Access for Non Governmental Organizations Network, MANGO, is based at the Southern Africa Research and Development Centre in Harare. The network provides e-mail, conferencing, and bulletin board services to NGOs and a variety of other users in Zimbabwe and also in Malawi and Mozambique.

MANGO was established by a group of local NGOs and subsequently received support through the IDRC project NGONet. It has provided start-up service for ESANet and HealthNet sites in Zimbabwe. In 1993, MANGO had 130 registered users and handled an average of 2000 calls per month. The network receives technical support from the University of Zimbabwe.

ZIMBIX: This network is the University of Zimbabwe's academic and research community's e-mail system; the 200 registered users are all based at the University. Internet connection has been provided through South Africa's UNINET-ZA (via Rhodes University in Grahamstown).

HealthNet: An effort to extend HealthNet within Zimbabwe is being carried out in the Midlands Province. Several district hospitals are using the network to transmit epidemiological data to the Provincial Medical Office where the data is analyzed and then reported back to the hospitals. This information flow has improved monitoring of specific health problems in the province.

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Sources:

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Barad, Bob. **“Bringing It Together: Africa 1992”.** In: Internet Society News, v.1 n.4, Winter 1993, pp. 10–11.

_____. **“Electronic Matatu: FidoNet in Africa”.** In: Internet Society News, v.1 n.2, Spring 1992, pp. 21–22.

_____. **Regional Electronic Communications Integration Facility to Promote Capacity Building for African Electronic Networking Skills and Services. Draft Terms of Reference.** Washington, DC, Baobab Communications, October 1993.

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