

# Towards a global knowledge for environmentally sustainable development agenda in 21st century southern Africa

Stanford Garikayi Mukasa  
Indiana University of Pennsylvania  
Journalism Department  
Indiana, Pennsylvania  
USA  
Email: MUKASA@grove.iup.edu

## Abstract

After three decades of research and theorizing on the information and communication approach to development, there is no universal consensus among researchers, academics, communication practitioners and development experts on the age-old question: how does communication and information causally relate to development? What has, instead, emerged is an alphabet soup of theories, concepts, approaches, paradigms and models on how information and communication might impact on development. Whether one looks at the various models of information and communication for development; or whatever one calls it, the theories advanced under the various acronyms still do not conclusively address the basic question raised above. Is there a missing link, variable or factor in all of these attempts to causally relate information and communication to development? What assumptions are embedded in the current theories of information and communication for development?

*The article will, by way of addressing these questions, propose an information, communication and knowledge networking strategy that will accommodate in a systematic way the varied and ever-changing information and communication needs of grassroots communities. The paper will map out a strategic vision for the information agenda for southern Africa, with a focus on the development of a new cadre of information agents drawn from a cross section of society, and suggest practical down-to-earth strategies that can be implemented to successfully and causally relate information, communication and knowledge to development on a sustained basis.*

## Conceptual terms

This paper will use the following conceptual terms for paradigmatic specificity.

**Global Knowledge for Development (GKD)** will be used, instead of Development Support Communication (DSC), to refer to the dynamic integration of technical-scientific and expert knowledge with local or indigenous knowledge. This symbiotic integration of two knowledge frameworks is a strategic element in the communication approach to development. GKD is paradigmatically specific in the sense that it separates information with knowledge from information without knowledge.

**Environmentally sustainable development (ESD)** is used to place value on the theory of development. The notion of sustainability stresses the need to develop in a way that does not compromise the ability of resources to support future development.

**Human agency** will be used to refer primarily to the often unacknowledged capabilities of local communities and individuals to play a dynamic role in their own development. Such individuals may be farmers, workers, peasants. As human agents they are redefined as active participants in, rather than passive recipient of, development.

**Development agent** will be used to refer primarily to individuals or groups of individuals like extension agents, village health workers, rural traders, school teachers, information officers, researchers. NGO representatives, consultants and any others engaged in facilitating development.

**Informatics** is the rational and systematic application, integrating the computer, satellites, VCR, telex, fax with the conventional telephone, television and radio, to socio-economic problems.

## Introduction

After three decades of research and theorizing on information and communication approach to development, there is no universal consensus among researchers, academics, communication practitioners and development experts on the age-old question: how does communication and information causally relate to development? What has, instead, emerged is an alphabet soup of theories, concepts, approaches, paradigms and models on how information and communication might impact on development. Whether one looks at the top-down,

bottom-up, participatory, community-based models of information and communication for development; or whether one calls it development communication, development support communication, communication for development, the theories advanced under these acronyms still do not conclusively and empirically address the basic question raised above. According to Bessette (1998,1), differences in communication strategies to achieve development objectives range from : extend participation to decision making and strengthen institutions; compensate for gaps in terms of attitudes and information; produce consensus among the participants in a development initiative,;promote social justice and democracy.

Some people may argue, and indeed point to 'successful case studies', that one or the other of the above theories have a proven record in promoting development. But to all intents and purposes, the vast majority of these case studies have had their successes circumscribed in time and space. This means the case studies have been selectively successful in a few communities but for a short time. Hornik (1988, 14) argues that, given "the available data on thousands of development communication projects in terms of audiences reached, practices changed, and long-term institutional survival "we can only assume that most of them [development communication projects] fail; they have not even reached a small part of the apparent goals." Hornik identifies two types of such project failures: theory failure that results from an incorrect assumption that a particular development problem is amenable to communication-based solutions; and program failure that results from an inadequately designed or implemented project.

Is there a missing link, variable or factor in all of these attempts to causally relate information and communication to development? Or, as Halloran (1986) once asked "If information is the answer, what is the question?" What assumptions are embedded in the current theories of information and communication for development? Why aren't there sustainable and measurable achievements of information and communication-based development projects and experiences?

The paper will argue that, inasmuch as the human being is as complex as he is spontaneously unpredictable, an effective information and communication strategy will have to be grassroots-based and symbiotically networked with local, national and regional information and knowledge resources. The information, communication and knowledge 'net' will accommodate in a systematic way the varied and ever-changing information and communication needs of grassroots communities. Such a strategy must not be a superimposition over, or a deconstruction of, other strategies, but a cocktail or rainbow constellation of strategies applied to meet development objectives. This 'rainbow coalition' of information and development strategy must not be an assembly line of strategies packed like sardines in a can, but a new dispensation that gives parliamentary rights to each strategy to engage in a dialogue with others. The notion of grassroots or community must be redefined to identify it with the concept of

human agency. In other words, if we are to speak of effective information and communication and knowledge in support of development strategy, we must see the intended beneficiary in terms of human agency, a rational and actively involved individual whose indigenous information and communication structures (community) will form the foundation for the cocktail strategy.

On this basis, the idea for a telecenter, and other information and communication technologies will have to be functionally defined in the context of grassroots information, communication and development environment with the human agency as the center of that process. The paper will map out a strategic vision for the information agenda for southern Africa, with a focus on the development of a new cadre of information agents drawn from a cross section of society, and suggest practical down-to-earth strategies that can be implemented to successfully and causally relate information, communication and knowledge to development on a sustained basis.

### **The community foundations for GKD**

Redefining development to include environmental sustainability, has brought about a concomitant shift of emphasis from structure to human agency as a focus of development (UNCED, 1992a). In the words of the Khartoum Declaration, development must have a human face and not just focus on the growth of structures (Bensti-Enchill, 1988). Development, according to Bernard Woods (1993: 15):

about increasing the capacity of individuals, families, local communities, local authorities, private organizations, and central governments to plan and manage their own affairs. It is also about putting in place the systems to create knowledge, skills, attitudes, policies and institutions for doing so, and about developing people's capability to use and manage those systems.

The notion of human agency underscores the growing emphasis on participatory communication as a human right (Kunczik, 1992) and empowerment (Yoon, 1996) even though participation communication lends itself to different interpretations.

The human dimension of development, reflected in the United Nations Development Programme's Human Development Index (HDI) involves education with its two key elements, information and knowledge. The expression " Give a person a fish and the person will eat for a day: teach a person to fish, and the person will eat for ever," can be applied to environmentally sustainable development. Education can play a critical role in the way humans interact with nature. What is needed is a national information and communication infrastructure that will enable people to access information and knowledge to help them develop.

Communication researchers and cultural anthropologists have long held that progressive human development depends on whether information and communication structures are in harmony with individuals' knowledge and experiences (Krippendorff 1985). Messages are not simply transmitted from authorities to passive recipients, but are part of a dialogue where both the sender and receiver of information are engaged in constructing reality and generating new knowledge from the existing technical, scientific, and experiential knowledge. Thus, the diffusionist theory, that is, the process of adopting innovations, must take into account the fact that humans will adopt innovation on the basis of its perceived relative advantage, compatibility, complexity, testability, and observability.

People at any level will only receive information if it is tailored for them, that is, it takes account of their traditions, is expressed in their language, and reflect their realities. The process of information sharing requires decentralized networking. The role of network links is to provide the necessary translation of materials both ways, from international to grassroots and vice versa (North South, 1993)

The diffusionist theory of communication for development draws its rationale from the modernization paradigm popularized by Daniel Lerner (1958) and Wilbur Schramm (1964). Its assumptions, which have long since been discredited, focused on the view that people could be persuaded through information to change their attitudes, values and beliefs. Popular or mass education through the media became the keyword for promoting this theory. However, given that interactivity or dialogue is a critical element in the knowledge generation and information dissemination process, the conventional media have historically had their inherent weaknesses. But these weaknesses can be mitigated if the mass media are rationally and systematically integrated with the new computer-based information technologies, or informatics. Not only does informatics introduce new communications technology, the computer networks, it integrates different media systems. Informatics can rapidly transmit information and knowledge and instantaneously link individuals with their peers and community leaders. An effective community information infrastructure must incorporate these factors to promote ESD at the grassroots level.

Songs, dances and drama are other elements of the community information and communication environment that will need to be utilized. The local language, which is rich in African philosophical expression (Gyekye 1988), can carry messages about ESD. Rural people recollect the messages and meanings that are carried in local songs and folklore for longer periods. The bulk of Africa's urban population, particularly the wage-earning class, have strong cultural links with rural communities and often use the same idiomatic language. In the urban setting, the notion of radio trottoir (pavement radio) refers to a subculture or an alternative channel of information flow. Ellis (1989, 1993) contends that important news is

often not heard from the official media but from conversations with friends and acquaintances. Radio trottoir is an informal public discussion of current affairs in urban Africa and is a modern form of the oral tradition.

Ellis says that African audiences give far more weight to spoken than written messages. If some of the spoken messages contained appeals for an ecological culture, this would encourage environmentally sustainable development practices. In their everyday conversations, Africans commonly refer to idioms that come from local songs. Radio can be used to sustain the oral tradition through songs (Bessant, 1994). Serious issues are discussed and analyzed in folklore (Traber, 1988:115). If messages about the ESD were embedded in these idioms, they would become a permanent aspect of community discourse. Radio and the oral tradition can be effective partners in ESD education.

One GKD strategy would be to locate information and communication resources (telecenters, for example) at community halls or schools. Not all community members will want or be able to go to the community libraries located at the school. However, community or opinion leaders, local teachers, journalists, information officers, or resident members of NGOs can be critical bridges between information resources and the local communities. Development agents can introduce scientific and technical information and knowledge into folklore or idioms for the benefit of community members.

In developing a community-based information infrastructure that is sensitive to local culture and custom, the information technologies must relay both technical and indigenous information and knowledge, giving neither precedence over the other. While the African culture has a tradition of ecological concern or what Falloux and Talbot (1993) call "a very environmentalist African culture," it needs an infusion of new technical knowledge in order to achieve ESD objectives. This entails establishing the right to communicate as inalienable for all members of the community. The community-based information infrastructure bestows power that, in turn, gives the local community the sovereignty to make critical decisions on ESD. Thus, according to the Food and Agricultural Organization's experts' consultation on development communication :

The ultimate purpose of knowledge-sharing is to empower rural people to take increasing degrees of control over their environment, and over agriculture, health, habitat, and other factors which so critically impinge upon the quality of life (FAO, 1987:2).

Premodern and rural information and communication systems were unable to reach very far outside the community. Thus information and knowledge were recycled without any fresh inputs. Knowledge did not grow, and there was, consequently, little or no socioeconomic development. In some societies, notably the western world and the more industrialized areas of Africa, information and

communication technologies and modern transportation systems changed this environment, opening communities to new information and knowledge. The instantaneous transmission of knowledge was made possible by information technologies, notably, the radio, telephone, and later, computers. Although the information technologies brought the problems of costs, lack of technical expertise, they were an overall success in cases where they were carefully planned before being introduced. Whether this can be replicated with similar success in less developing countries remains to be empirically verified, although there are indications that ICTs may have had an impact at least in the short term in some situations.

Research in information and communication technology has shown that information technologies play a potentially significant role in socioeconomic development. In the case of Africa, technological improvements, notably the advent of satellite communications, make information technologies attractive. This is because satellite communications overcome distances and national obstacles, and low-cost earth stations requiring relatively little maintenance and technical skills can be installed in remote rural areas. Technological innovations make it possible to design mobile earth satellite systems that can be moved from one rural community to another. In this way, thinly populated areas can be served without incurring high per capita maintenance costs. Barriers, such as scarcity of primary power, scarcity of qualified personnel, obstacles to constructing conventional transmission systems and economic constraints to operating these high-tech systems in unprofitable rural areas, can be minimized or overcome, and satellite communications can bring a host of information and knowledge to remote areas (INTELSAT, 1984).

Satellite communication systems not only enable the multi-point networking of communities, but also facilitate the efficient penetration and utilization of other information technologies such as radio, television, telex, and computers for data and information transmission. A host of media services can be transmitted through the information technologies such as large-screen video text, radio, or rural editions of urban publications.

### **The information superhighway in an African context**

Building an information superhighway requires coordinating the use of information technologies and other traditional information systems to enable the public to have access to information at reasonable costs. Three historic initiatives of the Organization of African Unity (OAU) and the International Telecommunication Union (ITU) form the conceptual basis for an African information superhighway. The Pan African Telecommunications (PANAFTEL), the Pan African News Agency (PANA) and its component, UNESCO-supported regional news agencies, and the Regional African Satellite Communication Project (RASCOM) are all

aimed at networking and promoting information and news exchange among African countries. RASCOM's objective is

to provide an efficient, reliable and economic means of telecommunications including sound and television and community reception by satellite, to all areas using a regional African satellite system, complemented as necessary by any other appropriate technology that is properly integrated into the existing and/or planned national networks with a view of fostering the development of African countries (RASCOM, 1991:52; Yusuf, 1987).

RASCOM, which was established by the conference of African ministers of communication and information and is under the technical direction of the ITU, reflects the initiatives taken by the African countries to develop an information highway that would network the continent without crossing European countries. The initiatives date back to 1964, when the OAU commissioned a study on the feasibility of linking Africa through a telecommunications network. The ITU has declared that its goal, that by the early part of the next century, virtually the whole of mankind should be brought within easy reach of a telephone is still far from realization but that some notable progress has been made (ITU 1998).

One initiative involves the Africa ONE Coordination Committee which was set up following a recommendation of the Consultative Meeting of African countries who are members of the ITU in Tunis, in November 1995. The Committee is made up of a group of African countries (Cameroon, Côte d'Ivoire, Kenya, Nigeria, South Africa, Tunisia, and Zimbabwe), representing the continent's five sub-regions, as well as the Pan African Telecommunications Union (PATU), the Regional African Satellite Communications Organization (RASCOM), AT&T Submarine Systems Inc. (AT&T SSI), the African Development Bank (ADB), and the ITU. There are scores of other efforts aimed at networking the continent.

The current and most far reaching initiative is the agenda for the African Information Society Initiative (AISI) evolving from the proposed Global Information Infrastructure (GII). Within the AISI framework strategies for GKD and ESD can be developed in a way that will dynamically network local communities and the regional and international environment. Recommendations for the AISI as proposed by the United Nations Economic Commission for Africa (UNECA) include:

To promote the development of transparent National Information and Communications Infrastructure (NICI) plans which involve all relevant stakeholders and are based on the values of, among others, rights in information access and use (UNECA, 1997).

The strategic objectives of AISI are defined as to:



- raise awareness and understanding of the immediate value of the information age to their national development;
- ensure the continuous flow of information within the society by supporting initiatives to improve and create new information and communication services in different sectors of the society;
- achieve maximum benefits from available information infrastructure by encouraging the development of systems that allow wide dissemination to individuals, business communities, non governmental organizations (NGOs) and the public sector;
- foster a new generation of men and women in Africa that uses information and communication technologies to leverage the development of their nations (UNECA, 1997).

Using this AISI framework, the national information and communication infrastructure, as proposed in this paper, would comprise four tiers, local/community, national, regional and continental, to ensure the efficient spread of information and knowledge among grassroots communities, planners, development agents, governments, and regional organizations. At its biennial conference, the African Council on Communication Education (ACCE) called for the establishment of a local information infrastructure, emphasizing indigenous-language newspapers and radio stations using indigenous or local languages (ACCE 1993). People involved in development, will, through such a national information and communication infrastructure be able to benefit from the knowledge and experiences of local and distant communities and from data banks located in the community, universities, and abroad.

The GKD project requires integrating modern and traditional communication systems. ESD can be promoted within this information superhighway, involving people in different social strata and people with expertise and experience in various aspects of development. The success of this system depends on whether cultural and basic human rights issues can be made part of the information infrastructure. Ithiel Sola Pool's (1971) notion of the information technology-determined globalization and universalization of information and knowledge must be reflected in the African governments' policies on information technologies.

### **The African mass media**

In designing a GKD strategy the traditional mass media can, despite their shortfalls, form a useful foundation. The dearth of information and knowledge on environmentally sustainable development is a major contributor to the degradation of the ecosystem in many areas in Africa today (Yanka, 1994:47). The print and

electronic media lack the capacity to interpret environmental issues for the public. Over the past twenty years, researchers have determined that the African media suffer from institutionalized mediocrity, the bulk of their news space or air time is devoted to dealing with issues that are not relevant to the communication and development needs of their people (Lent, 1979; Boafo, 1984; 1986; Brown & Kears, 1967; Dube, 1967; Dympwa, 1984; Frederiske, 1984; Halloran, 1986; Ng'wanakilah, 1981; Ogan & Fair, 1984; Okwenje, 1983; Traber, 1988; and Ugboajah, 1985).

Part of the problem lies in the fact that journalists were not trained to write about the environment (ACCE/IAMCR, 1989; and Mukasa & Becker, 1991). African media practitioners, at several conferences organized by the ACCE, have called for more training in environmental and consumer information and education in Africa (AFRICOM, 1991:6). The problems of the African mass media in addressing environmental and other development issues were highlighted at the ACCE biennial:

While African governments were signatories to the African Charter of people's rights (OAU 1981) and the Yaounde Declaration (1982) on the rights and freedom of the press, they tended to be less tolerant of media criticism. Professor Wole Soyinka referred to "the persistent habit of uncritical political followership in Africa...a situation which does not augur well for the survival of democracy in the continent"(ACCE, 1993:2).

Economic constraints tended to hamper the performance of the media in Africa. The director general of the cash-strapped Pan African News Agency, Auguste Mpassi-Muba said the news agency was suffering from inadequate political and economic support to enable it to perform its duties (ACCE, 1993:3).

Women are underrepresented in the media. When they are hired, they are given marginal roles, such as secretaries, according to Weade Kobbah Wureh, mass communication lecturer at the University of Liberia (ACCE, 1991:2)

There was a conspicuous absence of what Paul Ansaah called a "debate on national issues in the media," leading to a less informed population and a lack of cultural identity as a result of imported cultural programming in the electronic media (ACCE, 1991).

According to Chen Chimutengwende, African media personnel face poor wages, slow promotions, and suspicion when trying to investigate government operations (Chimutengwende, 1988:29).

## Media ownership

The media industry in Africa ranges from government or party-owned publications to corporate-owned chains as in Zimbabwe, South Africa, Kenya and Nigeria. In many Sub-Saharan African countries both government and privately-owned publications exist. Typically, a government-owned newspaper suffers from low circulation and low income from sales and advertisements, leading to a reliance on government subsidies. The government-owned paper tends to promote the government and the party in power and gives relatively less coverage to opposing viewpoints. In contrast, independent papers enjoy higher circulation, and sales and advertising often bring profits to the paper. When the paper records a loss, the parent corporation subsidizes it with profits from other operations. An interactive press that allows diverse viewpoints, a missing element in most African media, can enjoy greater economic support from the private sector and popular support from the general public.

Africa has about 158 daily newspapers, compared with 2,252 in North America. Nigeria and South Africa account for about 40 of the dailies in Africa. Twenty-two percent of the African dailies are privately owned. Nigeria, Kenya, and South Africa have a significant private ownership. These three countries have a total population of 149 million and 48 daily newspapers with a combined circulation of 3.367 million. They have a total of 24 million radios, 7.805 million television sets and 6.096 million telephones (Britannica, 1993). The Nigerian and Ghanaian media have a stronger tradition of indigenous journalism as a result of the way they developed (Ochs, 1984). The media industry in South Africa alone is said to be worth about US\$300 million (Carlean *et. al.*, 1990), and its ownership is highly concentrated (Hachten, 1984).

The notion of community radio is politically hard to sell, given Africa's tradition of centralized control of the electronic media. But as Africa democratizes, efforts are underway to establish community or local radio stations. The Montreal-based World Association of Community Radio Broadcasters (AMARC) is working with African and other broadcasters to democratize radio broadcasting in Africa. The concept of community radio means greater localization of broadcasting and greater participation by people. Community radio systems were started in Mozambique, Burkina Faso, Mali, Benin, Senegal, and Guinea. Mali, with eleven independent radio stations, has the most community radio systems.

The potential impact of alternative forms of information dissemination and communication, like music, drama, and visual aids on ESD awareness receives little recognition. Africa has a tradition of oral communication ranging from the Hausa drummers, whose sounds introduce news reports on Nigerian radio, town criers, mammy wagons and tro tros which ferry women traders between urban and rural Nigeria, matatus in Kenya and emergency taxis in Zimbabwe. Here, messages are communicated orally, interactively, and democratically.

However, the current information and communication environment is divided between the urban-oriented mass media and the rural interpersonal communication structures. As a result, little technical information diffuses to the rural communities where most of the Africans live. Information structures are bureaucratized and hierarchical with an authoritarian, top-down model of information flow. In this process indigenous knowledge is stifled and the technical information is, in some cases, removed from the geocultural realities of local situations.

### **Africa's information and communications infrastructure**

In addition to the scarcity of resources, Sub-Saharan Africa's information and communication infrastructure is inadequate and fragmented with little coordination to enable the people of the continent to share their experiences directly with each other. The colonial legacy has left the continent with an information and communications infrastructure that does not promote ESD. The mainstream media do not have the institutional capacity to communicate meaningfully and effectively development issues (Mazombwe, 1980). This is partly due to the mainstream media personnel's lack of specialized training in public affairs, environmental, legal, and health reporting. In addition, media are poorly circulated in rural areas, are usually not written in indigenous languages and do not usually carry the kind of information that rural people would find relevant to their immediate development needs. Alternative forms of communication provide the only information that people at grassroots level find useful.

Sub-Saharan Africa lags behind the world in the number of telephones, televisions and radios. Telephone penetration in Africa is low. Sub-Saharan Africa with a population of 500 million, has only 3.5 million telephone lines. Seventy percent of the African population lives in rural areas where there are only 228,000 telephones (Jipquep, 1990: 1993). Latest ITU statistics show a modest growth of about seven percent in investments in telecommunications in Africa (ITU, 1996). However, the ITU notes that at the beginning of 1997, 62 percent of all main telephone lines were installed in just 23 developed countries. In developing countries over 80 percent mainline telephone are in urban areas, yet 80 percent of the population lives in rural areas (ITU, 1998). About 75 percent of the African population has access to radio broadcasts. On average, there are 12.3 radio sets per 100 inhabitants. Television reaches about 40 percent of the population and there is one television set per 200 people (Jipquep, 1990, 1993). A small but steadily growing number of electronic networks are bringing badly needed data and information from resources in the developed countries. Some of these initiatives include; African Networking Initiative (ANI) supported by Unesco, ITU and IDRC; Capacity Building for Electronic Communication (CABECA); Pan African Documentation and Information Service (PADIS) supported by UNECA; UN

Secretary General's Special Initiative on Africa: Proposal for Harnessing Information Technology for Development; African Internet Forum.; UNDP's sustainable Development Networking Project (Richardson, 1996).

Non-governmental organizations (NGOs) have taken a leading role in developing computer-assisted communication in Africa. A number of initiatives have been or are being undertaken to improve the African network connectivity (Mikeson, 1992; Djajmen, 1993). Governments, donors, NGOs, among others, have invested significantly in the new technologies of information and communication (Jensen, 1996). In 1991 The World Bank, lent US\$124 million to Africa for informatics. Information technology investments were made in support of agricultural development, environmental management, training, outreach programs, and infrastructure management and planning in a selected number of African countries (Nagy, 1993). But the lack of national information and communication infrastructure policies meant this investment was never extended beyond bureaucratic management of governmental agencies and institutions. This massive investment can form the foundation for NICI at local and national levels.

### **Development communication projects underway**

Africa must utilize these information and communication resources to promote development objectives. The notion of development support communication (DSC), or more specifically GKD, provides a framework for using the media and other communication channels to mobilize local human and material resources for development activities (Dakar, 1997). Specific development projects must have a GKD component built into them. Development communication projects in Africa rely significantly on radio and interpersonal communication, underscoring the notion that oral communication is a key component of indigenous communication in Africa (Table 1).

An important lesson from case studies is that radio is probably the most pervasive means of mass communication. It's role must be defined with the GKD infrastructure. A decentralized and democratized community radio is not simply an instrument of manipulation by the bureaucrats but a genuine forum for dialogue. An effective community radio:

cannot be set up as a second, makeshift affair; it cannot be based on improvisation in the studio, with programs composed from bits of technical information pieced together in the style of a farmer's almanac. If rural people are to be captivated by it, rural radio has no choice but to enter into the arena, come face to face with its interlocutors in the field, using their languages, and take root in the rural culture. In short, those who inform and those who are informed must be on the same wavelength (FAO, 1987).

While these projects, and many others throughout Sub-Saharan Africa, have not made substantial progress toward achieving long-term development objectives, they have laid the groundwork for an alternative development communication structure on which the proposed national information and communication infrastructure can be built. Specific projects aimed at ESD can be designed within this framework.

Several lessons that can improve development communication programs have emerged from these projects:

- A conceptual framework based on audience research is necessary to ensure that the development communication project addresses specific needs of the community.
- A multimedia approach ensures that the messages will reach the maximum possible number of recipients (Table 2). Each channel of communication has strengths and weaknesses. An integrated media strategy will consolidate the strengths and, through careful planning, potentially minimize weaknesses. This will ensure that the maximum audience is reached and will encourage maximum audience participation.
- The institutional infrastructure to support research, training, and the administration of development communication projects is necessary to ensure continuity and development of skills and knowledge over a long period of time
- The community media concept will promote decentralization and democratization of the communication and information infrastructure.

Beltran (1993) proposes a nine-point agenda for communication for development, namely:

- combine the best of the development support communication activities with alternative means of communication (technical political perception);
- aim increasingly to reinforce institutions rather than mount short-term operations;
- persuade the large communication schools to include development communication in their curricula;
- support research into communication aimed at democratic development;
- support the small communities, the NGOs and union organizations;
- place emphasis on communication aimed at health, hygiene, nutrition and the grassroots;
- insist that political planners and leaders use communication to reach development objectives;
- encourage basic communication training at all levels; and
- reinforce institutional regional communication (Beltran, 1993:30).

Country	Project description	Media used	Lessons learned
Tanzania	Mobilized the population toward promoting good health, reducing illiteracy, building schools, and developing basic skills in resource management.	Radio	Greater impact is possible when interpersonal communication is combined with the radio, newspapers, posters and television
Sierra Leone	Media preference studies among rural population	Multimedia	Message conception and design are critical to guarantee that messages will be delivered consistently and correctly
Botswana	Multimedia messages to combine both indigenous and technical information	Multimedia	Message reinforcement through different media channels can produce a greater overall impact. Multiple media messages can extend and expand the reach of the message
Swaziland	Community-supported accelerated program of immunization	Multimedia	Use of local language is essential
Ghana	Rural information	Rural newspaper	Research on local information and communication environment is essential
Senegal	Farmer education	Radio	

Sources: Hall, Dodds (1977), Garforth (1987), Coldevin (1987), Mndzebele (1986), Bofo (1986), and Cassirer 1977)

**Table 1**  
**Development communication projects in Africa**

## The national information and communication infrastructure (NICI)

With the community foundations established, a national information and communication infrastructure within which GKD will operate can be established in a way that will afford people at both local/community and national levels to mobilize themselves into a cadre of proactive and dynamic agents of change, given





<b>GOVERNMENT</b>	<b>NATIONAL INFORMATION AND COMMUNICATION INFRASTRUCTURE(NICI)</b>	<b>PRIVATE SECTOR</b>
<p>Is key investor in NICI through development of infrastructure, literacy, and other public education programs</p> <p>Can use any of the communications technologies in the information highway to network with private sector, universities or NGO's</p>	<p>Is a public/private investment Is democratic Is ideally non hierarchical</p> <p>Is democratic: there is equitable access to NICI by all societal groups</p> <p>Has "several lanes" allowing different institutions to network with other institutions linked to the NICI</p>	<p>Key investor in NICI through development of private media and communications industry</p> <p>Can use any of the communications technologies in the information highway to network with the government, universities, or NGO's.</p>
	<b>Includes</b>	<b>UNIVERSITIES AND SCHOOLS</b>
<p><b>REGIONAL AND INTERNATIONAL DATABASES</b> Supply NICI with information and data</p>	<p>telephone newspapers television radio fax computer mobile cinema, etc.</p>	<p>Can access NICI to network with various institutions</p> <p>Can use NICI for distance, formal and informal education</p>
<p><b>NGOs</b> Can access NICI</p>		<p><b>URBAN AND RURAL COMMUNITIES</b> Can access NICI for information, knowledge and communication</p>

**Table 2 The ESD national information and communication infrastructure (NICI)**

Students at, for example, the University of Zimbabwe are learning about the environment. Both the instructor and students want more information about other countries' experiences in ESD. They use their computers to log onto the Nairobi-based NGONET and other data bases.

Rural villagers can meet at a local school and learn a variety of development strategies through a teleconferencing facility that links them to other villagers who have found solutions to problems being addressed. Information gained can be stored by a local school teacher trained to handle a local information database.

Mobile cinema units can be used to communicate messages through song and dance and theater from one community to another.

Journalists and information officers can download information from the internet on a variety of subjects, like farming, good health, sanitation practices, etc. and publish these stories in local languages. Or extension agents can use this information to promote a discussion among farmers, who in turn will combine new information, use their indigenously generated knowledge.

The national information and communication infrastructure is a strategic element of development planning, implementation, and learning. Not only does it help to organize work schedules, planning, and decision making in both the public and private sectors, it is a conduit for storing information and knowledge. The rational integration of various technologies ensures the effective and efficient transmission of information to the different community groups.

High rates of illiteracy and poverty among a substantial segment of the Sub-Saharan African population means that some crucial actors will have a limited capacity to access, let alone use, the national information and communication infrastructure. Hence, government and private sector investment in public education will potentially allow the disadvantaged groups to have some access and use of the national information and communication infrastructure. The need for a public lane on the information highway will be a policy imperative for the national governments.

With a more effective and efficient flow of ESD information, the public will gain a deep sensitivity to environmental conservation. Farming, land management, waste disposal, and recycling will no longer be haphazard, but planned and environmentally sensitive. Area schools, libraries, district administration offices, churches, or non governmental agencies will carry ESD information in their libraries, in some cases written in local languages and available in various audio-visual formats to ensure that the local people have access to critical information.

Specific days will be set aside for community education and discussions on the environment and, in rural areas, occasional visits to soil and forest conservation farms. The community information infrastructure will have integrated local patterns of communication and information flow with the mass media. These include local artists, dancers, poets, story tellers, writers, publications, mobile cinema, radio, flip charts, slides, and other audio-visual forms. This informatics system is able to accommodate both the literate and illiterate residents.

A notable feature of the national information and communication infrastructure is its responsiveness to various communities' information and communication needs. When a community cannot access data bases through computers, information is available in other formats. Indigenous generation of knowledge is another characteristic of the national information and communication infrastructure. The pictures and other visuals shown on television, mobile cinema, or on flip charts are drawn from the community. People get a chance to look at themselves and hear each other talk and express, in their language, their views on the environmentally sustainable development. This democratization and localization of the information infrastructure has contributed significantly to the success of the project.

The institutionalization of an ESD culture is dependent on a number of factors:

- Information flow and communication patterns are localized and democratized. In this format, the community information infrastructure is a part of people's everyday lives and discourse.
- The information infrastructure contains knowledge and information people are seeking to help solve their community problems.
- By being embedded in the people's daily discourse, either through local songs, drama, or discussions, the information infrastructure is able to show the danger of haphazard tree felling and tillage.
- By utilizing multimedia channels of communication, involving local artists, dancers, and story tellers in addition to the radio, television, and mobile cinema, the information infrastructure is able to heighten ecological awareness and consciousness.
- The journalists, information officers, and local educators are the key human resources in the establishment and management of the national information and communication infrastructure. The development of their skills to gather information, make videos or catalogue newspapers and publications, or translate messages into local languages, represents an investment in the national information and communication infrastructure.
- A national environmental awareness week is established during which communities engage in a variety of activities, such as ecological competitions to see who planted the most trees, maintained a clean environment, adopted innovations introduced by experts, or played any of the community roles in promoting the ecological culture.

## **Organization of an environmentally sustainable development national information and communication infrastructure**

Drawing from the above scenario, a building-block strategy can be developed to create a four-tier national information and communication infrastructure. Through collaborative efforts, the government, the private sector, and NGOs can benefit from the national information and communication infrastructure:

- Government will be able to provide goods and services to the people in an effective and efficient manner. The national information and communication infrastructure will enable government to manage efficiently and to make informed policy decisions.
- The private sector will, through the national information and communication infrastructure, have the ESD and other informational resources needed to make critical management decisions, improve productivity by efficiently mobilizing labour and material resources, and improve product marketing and profitability.
- NGOs will be able to improve project and program conceptualization, design management, and implementation.

Policy makers must create an environment that will enable the national information and communication infrastructure function without information controls. As part of the second-tier national infrastructural development, radio broadcasting could be privatized to allow the private sector to invest in the various technological components of the national information and communication infrastructure. There is also a need for public investment in the national information and communication infrastructure. Both the government and the private sector have vested interests in the successful operation of the national information and communication infrastructure. The private sector can reach a wider audience to market its products, taking into account the demand for environmentally friendly goods as well as consumer education. The government has a responsibility to ensure ESD is successfully applied. To this extent, the government can enter into a partnership with the private sector in public ESD education.

The media can play a critical role in institutionalizing an ecological culture. Media managers in the government, private sector, the church, or NGOs can institute editorial policies that will ensure more ESD publicity and a continuing forum for national discourse on ESD. Two strategic steps must be taken. First, the media must train environmental journalists and writers. Here, the government and the private sector can work collaboratively. Government can build training institutions and establish scholarships. The media can employ graduates from these institutions and hire writers knowledgeable about ESD. Second, government must

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remove needless restrictions on the media personnel's ability to collect public information and to electronically retrieve important information and data (Windhoek 1991). Receiving electronic messages in Africa is expensive, as the local government-run telecommunications entities often charge exorbitant fees for electronic networking.

The traditionally rigid lines separating the electronic from the print media are now blurred. The media must invest in interactive technologies and ensure that their personnel are computer literate. The media in any national information and communication infrastructure will become crucial informational links with the regional and international organizations. The national information and communication infrastructure is interactive and integrative. In line with this technological revolution and the democratization of information, the media must create an environment where information dissemination is interactive, such as, televised electronic town meetings between policymakers and the community.

There are a number of examples where the media institutions, the government, and the private sector are currently collaborating in development support communication. ACCE is spearheading efforts to train the media personnel on a range of issues including ESD, consumer education, and electronic communication. It is supported by the United Nations Educational Scientific and Cultural Organization (UNESCO), the United Nations Environmental Program (UNEP), the Friedrich Ebert Foundation (FES), and the International Development Research Center (IDRC). ACCE runs annual workshops and seminars on the environment. At these workshops journalists and government officials exchange ideas on strategies to heighten public awareness on ESD. In southern Africa, two media institutions formed about ten years ago, the Media Institute of Southern Africa (MISA) and the Southern African Broadcasters Association, are promoting professional and ethical standards among media professionals in the region. Headquartered in Windhoek, MISA now has chapters in a number of countries in the region.

At the community level, or the first-tier of the national information and communication infrastructure, the private sector, local government, and NGOs can cooperate to establish local information infrastructures. Traditionally, the private sector has been unwilling to invest in community-based information infrastructures. However, the private sector's (especially the retail ) business extends to local markets. The private sector can invest in a community information infrastructure in several ways. Community-based retail shops or businesses can distribute free pamphlets, wall posters, or sponsor ESD competitions in local schools. By promoting ESD in this way, the private sector has an opportunity to be visible and to advertise its products, especially environmentally friendly goods. NGOs can help the private sector to interact with the community. They can bring projects to a community that can benefit local businesses, such as building bridges, schools, and dams and sometimes create employment.

## **Conclusion: Toward a New GKD paradigm for Africa**

The question; how does information, knowledge and communication causally relate to development can only be addressed in context of a complex network of interacting sociopolitical, cultural technological, etc. elements. Thus, the new GKD paradigm envisions a maze of interacting factors each influencing, albeit asymmetrically each other.. In this GKD model one or more factors may have a predominant influence and impact on development, sometimes at the total exclusion of communication. For example, a local farmer may have all the information and communication resources he needs to plant crops, but political forces may deprive the farmers of the productive land they need. The problem of development in this case becomes an issue that is amenable to politically rather than information based solutions. alternatively, well-off farmers may need more information to sustain themselves. In this case, information and knowledge resources or structures are being created in response to an already developed economic environment.

The relationship between communication and development can thus be said to multi-lectical (mutually causal) and multidimensional in the sense that it involves more variables that interact or network at different levels and dimensions.

The new GKD paradigm entails the following factors:

- The top down model of communication and development must not be replaced by, but should be reconciled with, the bottom up model. Both models have a lot to offer if their energies are integrated and harnessed in a democratized environment.
- The diffusionist (stimulus-response) model must not be replaced but be redefined in both horizontal and vertical communication networking structure. People learn from each other and from experts as well as government officials. But such learning must take place in an environment of equitable, fair and just distribution of resources and services.
- The ICTs must not replace the traditional means of communication and information flow. A new paradigmatic dispensation that integrates all means and channels and forms of communication regardless of age, culture or level of technological sophistication must be developed to the extent that Internet messages can be communicated to the village without computers through radio or rural newspapers and in local language
- The consultant and expert must not be the commander-in-chief of development and communication forces but a partner and participant whose

knowledge and expertise is shared symbiotically with the indigenous knowledge in an atmosphere of mutual respect of each other's capabilities.

- There should be no "survival of the fittest" approach to communication and development, that is, no blanket repudiation and deconstruction of approaches or strategies in favor of the most favored strategy. Instead, each strategy must be viewed in the context of its potential contribution rather than exploiting its potential weaknesses in an effort to throw out the baby with the bath water.
- A strong central governing authority should not give way to community-based (local ) government simplistically for the sake of promoting participatory development and communication. Instead, a strong central government should promote participatory development at both community and national levels fully cognizant of the fact that the whole is a sum total of its parts and that the whole derives its strength from its components parts. A democratized environment is not incompatible with a strong central government if the rule of law and a civil society prevail.
- Neither government nor the public sector should necessarily be viewed as adversaries with little interest in the welfare of the masses, justified as this may be in a number of cases. Both government and the public sector should ideally be partners in investing in the NICI, once each is aware of the benefits from such an investment.

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