INFORMATION AND DEVELOPMENT IN ETHIOPIA

Lishan Adam*

Translated by: Yonas Admassu

I. INTRODUCTION

First of all, I would like to thank the Ethiopian Economic Association for inviting me and providing me with the forum to address the issue of information and development as it relates to Ethiopia.

My area of research concerns the impact of information communication technology (ICT) on development, and I am for the most part engaged in creating awareness among researchers, policy makers and donors regarding the contribution of new technologies, policies and the application of information technology toward social and material development.

Before tackling the issue, however, I would like to mention one of the causes for the gap existing between undeveloped countries, such as Ethiopia, and the developed countries of the world. The developed countries managed to attain the three levels of technological development by drawing up plans based on knowledge and implementing them through collaboration, by undertaking sustainable research based on concrete observation, and also by implementing their research results in accordance with their respective development needs. In these developed countries research is undertaken on every social and material concern. New ideas are continuously generated. Some of the ideas so generated are applied toward policy design, while others are in turn used to generate more new ideas, while yet others are applied toward creative projects and development undertakings. The cycle continues through yet other research undertakings in the various development sectors. It is through such iterative and collaborative endeavors that the constructions that we either see in the movies or had the opportunity to visit in person, or the buses and the airplanes that we use have been produced. This sustainable knowledge, far from being the monopoly of universities and research centers, is equally shared by governments and the populations at large. Communication networks (newspapers, magazines, researched documents, radio and television, as well as the Internet) play a big role in the dissemination and expansion of the knowledge so generated.

The knowledge ecosystem of a country developed through such sustained effort determines both the quality and the orientation of that country's development. In line with the maxim that a country's development is "the sum of its people's repertoire of knowledge," I make particular mention of this point in order to call attention to the fact that it is necessary to take into account, when talking about information and development, the level of the existing knowledge ecosystem of the Ethiopian people. It is believed, or assumed, that our country's knowledge ecosystem is pervaded by prejudices and biases, such that it lends itself to suspicion about and deprecation of what others do and, consciously or inadvertently, keeping any research findings locked up in one's closet so as to impede its dissemination to others, thereby contributing to the state of the poverty in which we find ourselves. Leaving, however, this issue of biases and prejudices aside for the moment, one finds that the awareness we have about our country's knowledge ecosystem, about information flow and use and their benefit to or impact on our development is really pathetic. I would like to call special attention

* Dr. Lishan Adam is currently engaged as a private information and communication technology consultant and researcher while at the same time teaching at various educational institutions, including Addis Ababa University. Dr. Adam holds the rank of Associate Professor at Stllenbosch University, South Africa, and is an Adjunct Professor at Unity University College. In 2002/03 he was a Hewlett Fellow of Information Technology at the University of Maryland at College Park. From 1999/00 to 2002/03 he served in positions ranging from Project Coordinator to Information Technology Consultant under the UN Economic Commission for Africa. Aside from his active engagement in African information communication issues and activities, he serves on the editorial boards of various information technology journals.

to the fact that the contribution those of us in the field of information communication have made to our country's information and development research undertaking is pitiably sad to the point where it has become so embarrassing as to hold us accountable to posterity.

Neither is this presentation of mine based on any thoroughgoing research. It is rather intended to share my insight, which is a result of a dozen or so years of my engagement in the field around the African continent. Accordingly, in this presentation, I shall attempt to say something about the concepts of information, communication technology and knowledge and the relationship between them from the perspective of my own profession. Having done this I shall give an overview of the historical development of information communication technology in Ethiopia. Following this, I shall compare the existing information communication technology of our country with those of the various countries around the globe. After raising some fundamental issues about the situation of information communication technology and knowledge in the context of Ethiopia, I shall conclude my presentation with the vision I have of Ethiopia in the coming years regarding the issue.

II. The Concepts of Information, Information Technology and Knowledge, and their Relationship with Development

Not only have information, information technology and knowledge been growing side by side, mutually supporting and feeding into each other, but it has also been quite sometime since communities have become 'info societies', economies transformed into 'knowledge economies' and the era we live in known as 'the information age'. We have indeed arrived at that stage in our history where information can no longer be viewed as separate and isolated from information technology and knowledge. So that we are bound to look anew into the concepts of 'information', 'knowledge' and 'information technology' and ask what these concepts are all about in a new context.

'Information' is one of the concepts that people try to define, each from the perspective of their own respective understanding. To the biologist, the transfer of genetic codes [intra or inter-species]; to the librarian, data from books and other documents; and to the computer scientist, data loaded onto a computer could be taken as information, respectively to each profession's needs and demands. Information is a useful tool for transmitting and receiving communication and data, while at the same time solving problems, and plays a determining role in the lives of individuals, communities and organizations. Information has numerous characteristics or properties. While, on the one hand, information may suffer from clarity and, therefore, demand of us to ask more questions, on the other hand, it constitutes the power to remove doubts from within us and alter or transform the substance of our knowledge. According to information theory, information means new message. The message becomes information only if the proportion of signal-to-noise ratio is high. If the message is new, that is, hitherto unknown, its message content is high, while, if it is something we are hearing for the second time, its message content is low. If the latter, it is as if we were simply wasting our time when a person communicates to us something we already know about.

In terms of information theory, the information content of such vague messages as "it is under study"; "it is being worked out"; or "it is still being collected" is low. If we anticipate ourselves and assume that the individual sending the message is going to communicate to us would read nothing more than "it is being . . . worked out" or "it is being worked on," the value of the information that individual transmits to us is zero.

Another characteristic, or property, of information is its capacity to provide someone with a wealth data while, at the same time, denying another the same data. This property of information results in the creation of what we call 'info-rich' and 'info-poor' societies. While the capacity and power of the information-poor party is low, this allows for the information-rich party to have the capacity and power that would enable it to exert its influence on the former. A given individual, organization or community may find itself possessed of a wealth of information in one respect, while it may find itself information-poor in others. So it is that a highly educated person may not even know how a tape recorder operates to produce the music that it does. Again, a person well versed in the affairs of the world may not have any awareness of how functions at

his/her home, at the homes of his/her neighbors, or in the general neighborhood he/she lives in. The important thing to grasp is that the concept of information wealth or information poverty has as its focus situations whereby the lives and development of individuals have been negatively affected as a result of being denied, consciously or otherwise, access to information.

- If an individual, organization or a community does not have access to the mass media;
- If individuals form themselves into groups and prevent the dissemination of information to those outside of their groups (and this is common practice among scientists);
- If an individual, group, or community is too vain to reject and assimilate the information that it could get;
- If the information the individual, group or community has does not improve and always remains the same and proves to be worthless;
- If the information the individual, group or community seeks proves to be unaffordable (in terms of finance, time or labor);

In such cases the flow of information will be obstructed and what is known as information-asymmetry will ensue.

In instances where information-asymmetry occurs, the tendency for the party in possession of the needed information to practice rent extraction becomes inevitable. It is very likely that you are aware that the corruption and other unethical practices that you witness in our country are by and large a result of such information-asymmetry. When an official tells you to come some other time for a document that happens to be right there in front of him/her awaiting signature, which means that there is information gap between the official and you.

One of the major links between information and development expresses itself in the following oppositional terms: while, on the one hand, access to the right information at the right time and in the right place facilitates development and growth, the existence of information-asymmetry on the other hand constrains the same development and growth. A person that has the right information will inevitably stand up for his/her rights. One who stands for one's rights will be in a position to bring about a sense of good governance, which forms one of the bases for development. The impact even of an iota of information on individuals, organizations and communities could be tremendous. It is, therefore, often difficult to express the value of information in monetary terms.

Now that I have said this much about 'information', I would like to make some observations about information technology. What ten years ago we used to call 'information technology' (IT) is known today as 'information communication technology' (ICT). The reason for this change in nomenclature is the convergence today of computer technology and mass media. Viewed differently, it is because the practice of using one telephone line to just call someone has been expanded for sending messages via the Internet. It is because we can today use radio and television channels, which in the early days were used for news broadcast and entertainment, for receiving information through linkage to computers. The fact that this convergence has resulted in the multiple use of telecommunications system (lines) will help broaden our awareness about how the system operates.

Let us take a hypothetical example. A certain woman is at home with access only to one telephone line. She is using this one line to access sports news on the Internet. She can use the same line to send e-mail, while at the same time she can talk to her uncle through what is known as Voip and use the computer to chat with her friend in Dessie. While this convergence may have come as 'the-world-at-your-doorstep to the user, it may prove a headache to service providers. Even with this problem for the providers, it is still for the benefits enumerated that information communication technology is said to be a liberating force.

By information communication technology we mean not just communication networks made up of computers and the software products we use with them, but also the people who use them, regulations, old and new means of communication, etc. The fundamental feature of information communication technology is not just its capacity to process and disseminate information but most above all, its ability to enable us to share knowledge. To the same extent that information and knowledge are sought after everywhere, so also has information communication technology assumed such a magnitude as to make it

difficult to imagine any place where it is not needed. There is no other means comparable to information communication technology when it comes to providing information easily and at competitive cost and making it directly accessible to the consumer. Information communication technology has three fundamental characteristics.

1. A given society's level of economic, organizational and scientific development determines the scope of application and role of ICT. This goes to show us that, if Ethiopia intends to serve as the network hub_of Africa, just as Singapore has managed to be for Asia, what it needs to do is focus on building up its economic, organizational and scientific capacity rather than on the mere acquisition of technology;
2. A major component of information communication technology is the ability of a given society to be able to harness and steer that technology in the direction it wishes and be in control of the advantages and disadvantages that come along with it. What this means, in the last resort, is that our country could benefit a lot from this technology by designing and formulating the right policies;
3. Information communication technology has not only enabling aspects but also its own constraining dimensions, whether to individuals, organizations or communities. This characteristic of information communication technology stands out as a forewarning to us all to stop and think about choosing among possibilities those that are advantageous to our development, instead of blindly running after the clarion call of " Technology or Death!"

As I have pointed out earlier, one of the benefits of information communication technology is its capacity to enable us to disseminate knowledge. The outmoded slogan "knowledge is power" has now been superseded by the new slogan "knowledge is development," leading to the conviction that the enhancement and dissemination of knowledge is crucial to the opening up of opportunities for growth and development. Accordingly, over the past decade, emphasis has been given to the management and sharing of knowledge, rather than information management. It is in line with this new development that the World Bank believes that, since such countries as Korea, Singapore and Hong Kong achieved economic and social growth as a result of pursuing knowledge-led development, other underdeveloped countries similarly would achieve good results if they followed the same path and exerted their efforts on educating their people and using new technologies. The main secret of the developed countries in choosing to rely less on their natural resources and switching to the production of knowledge lies in their conviction that they would achieve more if they relied more on knowledge and sound judgment than on their ever diminishing stock of natural resources.

What countries, such as Ethiopia, whose natural resources are headed on a course of exhaustion, need is sustainable planning based on knowledge and implementing those plans. For these plans to work they need to:

1. Accumulate the needed amount of knowledge and systematize and disseminate it in accordance with their particular needs;
2. Train and educate their societies and enable them to use the available knowledge;
3. Use information communication technology for the dissemination of knowledge.

The crux of the matter is that knowledge exists in the minds of people and that it could only be disseminated at the appropriate time, that is, when conditions are mature; that it is impossible to force people to use or disseminate the knowledge available to them. Accordingly, therefore, organizations and governments should seek ways by which to expand and distribute knowledge and skills to their respective target communities. What my limited awareness points to is that the amount of knowledge disseminated in our country is low; that we have difficulty in receiving and accepting new ideas and translating them into concrete action, and worse still, that what knowledge ecosystem we have is not genuine but one based on disdain and deprecation, stagnant and, not seldom, retrogressive. So the next logical question is: how is it possible to extricate oneself out of this situation?

If the kind of knowledge that the majority of scientists believe would serve as a solution must be disseminated properly, the

following measures need to be taken:

1. Knowledge should be appropriately systematized and coordinated for presentation in narrative form by the person responsible for its dissemination. When journalists become professionals or professionals become journalists, they can prove to be good teachers, with the acquisition of the necessary experience in the bargain.
2. Unless knowledge is presented in narrative form and with practical orientation it cannot hold the attention of the target(s). Even if the recipient listens to what is being presented, it will all disperse into thin air if the listener's attention has not been arrested. What this means is that, if disseminating knowledge is carried out, as has been conventionally done in the past, through the mass media or in the form of lectures or sermons, it won't be assimilated by or become an integral part of the audience. If there must be a link between knowledge and action, knowledge must first be successfully transmitted to the intended audience. Then individuals must be convinced that they can change their lives through action based on the knowledge they get.
3. We begin to learn when the modes of knowledge acquisition that we have been used to and had attachment with begin to unravel. When our habits and the customs we have cultivated for a long time meet with crisis, then we begin to open our doors to new ideas and start charting new ways. We cannot rid ourselves of our work regimen, culture of dependency, negative attitude, indolence and our attitude towards environmental cleanliness by simply getting together at meetings and condemning our idleness or the multiplicity of holidays, as we have been doing so far. We can do all this by the wise and indirect employment of disruptive metaphors that take into consideration the social life of our communities and the damage caused by the problems cited.
4. Mere accumulation of knowledge or mere building of institutions for the organization or systematization of knowledge will not help us in developing our knowledge ecosystem. Conversely, the laying down of the channel for the transmission of knowledge from one point to another and readying ourselves for concrete action will bring about better results. It is believed that building networks, by means of which people will be able to exchange ideas and engage in debates about different issues, will contribute more to the dissemination of knowledge. Fortunately, however, our country has many social networks, such as, for instance, forums like this one where one speaks while others listen, or conversations or chitchats at coffee ceremonies. It is, therefore, possible to transform such occasions into forums suitable for the dissemination of knowledge and, accordingly, create opportunities for taking the next step from knowledge to action.

The important point is that, if the government believes in research and its dissemination as well as the flow of knowledge and, accordingly, takes the necessary measures; if the country's intellectuals and those Ethiopians in the Diaspora collaborate on the strengthening of networks for the transmission of knowledge; and if we undertake extensive research on our knowledge ecosystem and implement the results thereof, then we can steer our country towards knowledge-led development.

But all this should not be taken to mean that we do not need knowledge from external sources, from the outside world. Because many Ethiopians have access to networks with the outside world, what we have to focus on is the building up of our country's capacity from within. The Amharic saying '***yesew worq ayademq***'[*] aptly describes the situation we are talking about. As there is no country we know of that has developed on the basis of the knowledge of foreign consultants alone, our concern should be the enhancement of our own capacity since the building of our knowledge ecosystem would help our people extricate themselves from the poverty that has forced them to stoop for so long and, consequently, enable them to look straight ahead and walk proudly. But what does our situation look like when it comes to knowledge and information?

[*] Freely translated it means 'jewelry borrowed from others does not make you look comely as your own'.

III. The Development of Information Communication in Ethiopia

Although our country happens to be one of the first to introduce itself to information technology, the steps it took over the past hundred years have not been a matter for gratification. Although Ethiopia also was one of the leading countries on the African continent in opening the telecommunications sector, according to the Digital Access Index issued last year by the International Telecommunications Union, it ranks fifth on the list of the least developed countries in this regard. Ethiopia was one of the first countries to provide itself with computer technology. Ethiopia procured computers in 1960, while Zimbabwe and Zambia did so in 1961 and Cote d'Ivoir and our neighbor Kenya did the same in 1962. However, according to the Index issued by the research institute known as Orbicom, Ethiopia is the last when it comes to info use and info density. Neither can we say much about our information network development. In order to have a clear picture of our information networks, we shall review them under six different headings:

3.1. Libraries and archives;
3.2. Data gathered and documented by the government and private institutions;
3.3. Data gathered through research and dissemination;
3.4. Information provided to the public by the mass media;
3.5. Information about our country on the Internet;
3.6. The country's indigenous knowledge systems.

3.1. The development of libraries and archives

One of the important legacies that colonialists left behind in the different African countries they once ruled is the laying of the foundation for the expansion of library systems. Although most of the countries of Southern Africa had managed to develop their library systems after World War II, in our country, however, except for those libraries that sprouted sparsely in some of the schools and a few towns, we have not been able to manage the development of a library system worthy of the name. In per capita terms, the ratio of our country's libraries to the population figures is one of the very lowest in the world. The number of libraries in our country is so low that it has been difficult even for UNESCO to give it any significance space in its documents.

The few libraries that had been built here and there during the imperial regime were re-organized in the form of *Kebele* Study Clubs during the military regime of the *Dergue* for purposes of disseminating Marxism-Leninism. While, proper to the military regime's ideological line, the books they acquired were those of Mao, Marx, Engels, Lenin and others consisting in the main of Russian literature, the attention given to the organization of the library system was better than what we see at present.

In fact, during the *Dergue's* regime, close to 7000 reading stations or terminals were established in every Kebele all over the country in order to buttress the newly reorganized literacy program. At present, however, except for the 12 libraries in Illubabor, salvaged, in an almost miraculous fashion, with the help of Oxfam Canada, and that have made a reading public of the surrounding communities, all the other reading stations or terminals have disappeared, once again sending many an adult that used to be literate back to illiteracy. This much we know. Since I have described the situation of Illubabor in another, broader study that has been published, I shall not go into any of the details here.

The important issue here is that, not only does the non-existence of libraries prevent people from acquiring knowledge but their absence deprives them of the additional services they provide as forums for them to interact and discuss their problems, while at the same time it negatively affects the enthusiasm of the youth to acquire knowledge, thereby contributing to the retrogression of our development. Except for the foreign aid in books that the few libraries in schools and those that we see budding sparsely around towns get, we see them deteriorating in terms of material and financial resources, thereby contributing virtually nothing towards the country's development. Many school (academic) libraries have failed to be gateways to knowledge as a result of lagging behind the advancing technologies of the time. Consequently, they have become nothing more than places for students to read books assigned by their teachers, or they have simply become buildings for the short-term stocking of books. The proliferation of cheap photocopy facilities has greatly contributed to the devaluation the worth of libraries. Among the measures to be taken by way of organizing library facilities are the following:

- Emulating the experience of Illubabor and expanding the

building of reading rooms in the different localities;
- ❖ Using new technologies and enhancing the quality of the services such reading rooms provide;
- ❖ Creating a competitive and cooperative spirit among libraries;
- ❖ Organizing "Reading Weeks" and attracting the youth and the population at large to these reading rooms.

Speaking of the proliferation of a reading culture, allow me to relate a recent experience of mine. I went to a coffee shop and ordered a cup of tea, meanwhile browsing through a paper I had with me when the waiter came and told me that it was forbidden to read "here." When I told him I was reading only until I finish my tea, he still insisted that it was forbidden. When I asked him why he allowed the customers who were chatting to keep on talking, he responded that talking was allowed.

3.2. Data gathered and documented by the government and private institutions

Since there are no extensive, statistically corroborated studies done in the different sectors (agriculture, education, health, urban land transaction, taxes, crime, investment, loans, etc.), it has become difficult to estimate how many databases, along with their corresponding users, there are in Ethiopia. As a result of lack of knowledge about the documentation of data and information, the abuse people suffer at the hands of record keepers in the different government and non-government offices is tremendous, usually on such excuses as computer malfunctioning; power failure; or having just switched to computers, but lack of experts to operate them, etc. Considering such and more related problems, the change so far made, far from solving our problems, only appears to have worsened them. The Ethiopian Science and Technology Commission had, in the 1980s, launched a project of gathering and documenting data. After a lull towards the beginning of the 1990s, the activity has now resumed. The Government has recently taken measures to have computers installed in its various institutions to alleviate the abuses perpetrated on clients.

However, the low quality of the available data, the shortage, both quantitatively and qualitatively speaking, of information experts, the exodus of computer professionals, the low level of awareness with regard to computer use, and similar other problems appear to have become constraint to the efforts so far made. The assertion by some individuals that it has been possible, by using computers, to reduce the amount of time it takes to execute a given task from 30 days to 30 minutes is a telling comment on the low level of our country's awareness about computers and their application. Without people to operate them, or without effecting change in the culture of the population with regard to computer technology, computers alone cannot reduce the time a given task takes from 30 days to 30 minutes. The trick lies not in changing the technology but on changing the attitudes and degrees of efficiency of people. Computers can be good tools only if people are willing to change and efficiency in leadership has been achieved. Otherwise, computers would only open the door for the speedy deterioration of what has already gone sour.

All this does not, however, mean that computers cannot bring about efficiency in the work place. Any computer use based on research and supported by information network not only helps organize data and reduce the mistreatment of clients, but it also enables us to coordinate the information available to us and render it meaningful or useful. If the data on agriculture, education, health, etc. were to be integrated with the data gathered at the *Wereda* and Kebele levels, it would form a basis for planning, education and the enhancement of research and dissemination of research findings.

Because the computer information system currently operating in Ethiopia has been limited to the satisfaction of the internal needs of institutions instead of being expanded for networking and exchanging information with other institutions, it has rendered all the effort and the usefulness of the system little or no value. In order to make the activities undertaken in this regard meaningful, it would be advisable to take the following steps:

1. All data gathered by means of computers must be so organized and developed as to make it easier to exchange information;
2. Favorable conditions must be created for information experts in different institutions to gather and document quality data;

3. Favorable conditions must be created for people to easily access computer-generated data;
4. The application of data relevant to the learning process (data on health, education, business) must be expanded.

3.3. Data gathered through research and dissemination of results

Although the findings of the research in the area of science and technology could form the basis for the kind of information society we are intent upon building, our country has not still been able to become the proprietor of meaningful research and dissemination of research findings in the different professions other than the activities undertaken in the areas of agriculture, health, chemistry, history, sociology, economics, etc. There are those who believe that the expansion of the graduate program that is currently being undertaken by the country will help strengthen our research and dissemination capacity. However, recent experience has proved that, in the absence of moral and material incentives to encourage researchers, which we see provided in other parts of the globe, engaging in the expansion of graduate programs cannot, in and of itself, bring about the expansion of our research activities and the dissemination of the findings thereof.

In this regard, our country, far from being one where research findings are being regularly published, is one of those countries where the findings remain without seeing the light of day. Less than 10 journals are published in a country with a population of 70 million. The reluctance of researchers to publish their findings, problems of proficiency in the English language, shortage of Internet services, coupled with the subsistence-level income of researchers, have contributed to our country's low ranking in scientific publishing compared to our neighbors and the majority of African countries. In a scenario where a few Ethiopians have gone to other countries and proved themselves worthy researchers and scholars contributing solutions to the problems of other countries, the drought we suffer in the wealth of publication of the country's research findings is astonishing and pitiable at the same time. Unless sustainable research that is capable of providing solutions to the country's graver problems is undertaken in the different sectors and disseminated to the people as well as to researchers, the knowledge-based economy that we dream about building will only remain a mirage. It is, therefore, incumbent upon both the Government and research institutions not only to undertake research but also to have the findings published. It is possible, as it has been in some Southern African countries, to provide incentives, salary increment and funds for procuring books every time researchers publish their research findings and, by so doing, not only provide impetus to those researchers who are holding back on their findings but also encourage new researchers to emerge. It is also necessary to create conditions favorable for researchers to have access to the Internet without any difficulty.

3.4 Information supplied to the public by the mass media

When one speaks of information, it is only obvious that one should also talk about the mass media. Since my research activity in this area (and I do not know of any research undertaken on the sector) is only minimal, I would prefer to limit myself to mentioning a few important points.

Although the airtime of television and radio services and the proliferation of the free press appear to have relatively expanded, they still have a long way to go by way of contributing to the efforts made to educate the people, create job opportunities and bring about cultural change.

1. The situation in our country is one where the level of television and mass media services is low, where the daily circulation of newspapers is less than 50,000 and where the ratio of newspapers to readership is 1:1400. Lack of community radio stations and the fact that the existing mass media focus on issues of concern to towns, but especially Addis Abeba, and, consequently, their inability to create information flow centered on the lives and concerns of the rural community constitute another aspect of the problem.
2. Our country's mass media have for a long time been running with subsidies from the country's different regimes. Consequently, they have been limited to implementing the directives of the governments, with no regard for community programming to allow for the

participation of the public at large, so that the people have only managed to be passive receptacles of what is being broadcast instead of being critical readers/listeners possessed of media literacy.

3. The measures taken to provide incentives, salary increase, subsidies or other benefits to assist in the strengthening and enhancement of the mass media and professional journalism have not been encouraging.
4. The contribution of the government and donor organizations toward the growth and development of the mass media has not been as much as that towards the building of clinics and schools. Consequently, there has been a growing tendency to encourage the mass media to run after advertisements and commercials to generate the income they need.
5. There are no media schools and media-training programs organized in sufficient numbers with the corresponding level of quality, while the training the existing ones provide does not go beyond equipping the trainees with the basics of journalism, thereby stopping short of helping them master the professionalism capable of enabling them to solve the people's problems. We are only beginning to provide education and training in journalism at the level of higher education.
6. The existing information flow is geared toward solving the problems of the developed countries instead of focusing on the internal problems of underdeveloped countries such as ours.
7. Insufficient experience and knowledge, coupled with the absence a journalistic code of ethics, the proliferation, out of the blue, of journalistic practices in the absence of professional training and the attending certification, the increase in the writing, reading and dissemination of gossip and, consequently, the threat all these pose to our society's knowledge ecosystem constitute our basic problem in the sector. Looked at from the perspective of information dissemination, therefore, it stands to reason to suggest that, with all these problems, the society, for the most part engaged as it is in reading, ingesting and disseminating unfounded and unscientific news and information that have little or nothing to do with the actual life situation it finds itself in, cannot make any headway along the path of development.

The task of the mass media should not be limited to contributing to the building of a democratic order that enhances the livelihood of the society. They should work towards encouraging people to be diligent and learn to take risks in their day-to-day activities. They should be capable of solving such lingering social problems as indolence, insincerity, and chasing after the kinds of development not based on research. The media must be able to help create citizens that are not just passive listeners of what is being transmitted but active participants capable of sorting the chaff from the grain and equipped with the faculty of critical thinking. Towards this end, therefore, the Government has to exert the same concerted effort on the building of people's capacity to engage in critical thinking much the same way it does on the building of roads and schools. Reorganizing and updating the existing knowledge diffusion system has more to contribute and would prove more significant than just setting up a school or a university.

3.5 Information on the Internet

The information available on the Internet is, by and large, focused on solutions to the problems of the developed countries, and mainly cached in their respective languages. The stock of information provided by the worldwide web over the last 10 years has increased with such speed as one has never witnessed or heard of, so that it has now been quite some time that the Internet has become the leading information system in the area of providing data on any issue of concern to users, even if only in a fragmented manner. It can therefore be said that the Internet is the world's mirror of information and data. With all this, however, the information infrastructure put together in our country is limited to the few websites that individuals and organizations—particularly such institutions as Ethiopian News Agency, Walta Information Center and networks of the private press—have designed, mainly for their own internal use. Consequently, with the exception of the information and news that one gets from these sources, it has been difficult to access documents and statistical data written about our country on the Internet. To take but one example, the fact that the voices even of our universities are so absent from the Internet that the

world does not even know where they are located is rather humiliating. All this goes to prove that Ethiopia ranks one of the lowest countries in Africa in terms of using the Internet and, in general, in terms of the information literacy of its people. In order to organize Internet-based information, we need to do the following things:

1. Producing a labor force trained and versed in the designing of websites and data base as well as increasing the population's information literacy rate;
2. Distinguishing between good and bad [useful and useless] information available on the Internet; creating the capacity of people to gather data from different communications media and developing and systematizing the information so accumulated;
3. Developing Ethiopian languages in ways that make it possible to use them on the Internet and undertake sustainable research activities and use the findings to disseminate information to the people.

Another issue that we cannot skip without mentioning is that of the importance of the strengthening of our publishing and content industry. Accordingly, we have to create favorable conditions for the transmission and dissemination of literary works, films, music and other artistic products through the Internet and other available new technologies to global users.

3.6 Indigenous/traditional knowledge

Starting with traditional medicine all the way through weaving, metal work, pottery, traditional painting, increasing harvest by mixing manure and ashes constitute a knowledge system developed by the people over the years for solving their different problems. Yet this system has remained stagnant, with little or no chance of being developed or enhanced [to suit current practices]. On the one hand, the new or modern knowledge system has encouraged us to use the knowledge system of the developed countries as solution to our problems, while at the same time pushing aside or ignoring and deprecating the knowledge system of the poor accumulated through years and years of practice. On the other hand, donors and so-called educated individuals have discouraged us from relying on our own capacity and, instead, encouraged us to cultivate the culture of dependency and the appreciation only of what is foreign, the result being that our indigenous knowledge and innovation systems have, as with our plough, remained unchanged for thousands of years. The cause of our backwardness is the low level of our entrepreneurial and decision-making capacity when it comes to experimenting with new ideas and products and integrating them with our ways of life and local experiences and determining which of these new things are beneficial or harmful to us.

In order to extricate ourselves from our current condition, it is important to: undertake extensive social research in the area of our indigenous knowledge and its dissemination; encourage our indigenous knowledge sources (e.g. traditional apothecaries) to come out into the open and share their knowledge; gather and document information and data on indigenous knowledge systems--before they disappear--by using the new technologies available to us, and make sure they are transmitted to coming generations. Strengthening the link between modern education and traditional knowledge systems might perhaps help us in discovering heretofore unknown and useful wealth of knowledge that would enable us to develop our economy. If, given the country's rural wealth of a wide range of biodiversity available to us, our culture and indigenous knowledge systems could be integrated with the new knowledge, we could increase the manufacture of organic products for our tourism industry and make them available to the global market, much the same way as such countries as Scotland have managed to make of their whiskey, alias the 'liquid gold', the basis for their economy.

It is only when the information resources mentioned above--that is, libraries, data documented by government and other institutions, the mass media, indigenous knowledge systems, etc.--are developed in an integrated manner that we would be able to build an information ecosystem that could speed up our country's growth and development. Since information communication technology is a tool for strengthening the link among the said information resources, our effort to build the said information ecosystem would at the same time be one aimed at strengthening our country's information communication technology. But what is the level of our country's information technology system?

IV. The Situation of Ethiopia's Information Communication Technology

Although, within the past few years, our country's information communication technology has shown twinkles of improvement, it still lags behind compared even to that of our neighboring countries. Telephone consumption has increased from 0.33% to 0.7% of the population. Mobile telephone (cellular telephone) consumption currently stands at 0.2% of the population. The average increase in telephone use in Africa was 2.74% in 2003, while that of mobile phone was over 6% in the same year. Of the limited telephone lines available in our country, 60% of the telephone and 80% of mobile phone services are concentrated in Addis Ababa. The contribution of the telecommunications sector to the country's gross national product amounts to a mere 1.7%.

Because the policy and vision the country has with regard to information technology is rather poor, the result we have achieved is equally low. Such countries as India, Brazil, Estonia and Costa Rica follow a policy of attracting foreign investment and focusing on the building of their local capacity, as a result of which information technology has contributed to the growth of their respective economy.

Because of the absence of comprehensive information technology policy and the tax levied on computers is high in comparison to other countries, the ratio of computers to the country's population is very low. Ethiopia is the only country where the acquisition of computers at the individual level is still a luxury, where procurement of the same appears to be a monopoly of organizations and government offices. According to the 1995 report of ITU the total number of computers at the time was 150,000, while in per capita terms 1 computer serves 500 individuals. The African average is 1 computer for 70 persons.

Although, on the other hand, Ethiopia's Telecommunications Corporation "boasts a change" in the system, the problem of shortage, particularly in terms of Internet services, is extremely high. While the number of Internet users in Ethiopia figures the lowest in the world, the quality of the services rendered is equally a matter of serious concern. In Ethiopia the number of Internet users is about 0.1% or 70 thousand. In other words, out of every 1000 people only one is an Internet user. The average for African countries of Internet access is one for every 60 people. Of the 350,000 civil service employees only 2,200 are Internet users.

What makes the situation a matter of serious concern, as the study indicates, is the fact that the increase in the number of Internet users has not shown improvement of any significance. Among the reasons for this state of affairs are the following:

1. The low quality and the high cost of the services relative to the buying power of people's income;
2. The fact that the Ethiopian Telecommunications Corporation, instead of providing wholesale Internet services and allowing private enterprises to go into the retail business of providing improved services on a competitive basis, has monopolized the sector, with itself playing the role of supplier, distributor and retailer all in one boot;
3. Failure to provide services to organizations and schools by procuring wholesale communication network (bandwidth);
4. The dominance of monopoly-based market structure within the Corporation.

Taking all these into consideration, while many experts argue that the main cause for the low growth and expansion of the Internet is the fact that the Telecommunications Corporation is under government monopoly, the majority argue that the problem of telecommunications in Ethiopia has nothing to do with ownership. The problem, they argue, is rather the fact that the system is not organized efficiently and in such a way as to allow room for the participation of the community at large, job-seeking Ethiopians and organizations, with the view to alleviating the country's poverty. Accordingly, they argue, unless policy makers open up themselves to new ideas and make improvements at different levels within the system, Ethiopia cannot take the desired steps with the desired speed on the basis alone of what the Telecommunications Corporation claims it would be able to do. Unless the Government dares to implement information technology plans supported by different studies, unless it heeds what users and other people with visions have to say, unless, also, it

monitors and follows up the experiences of other countries and allows for the participation in the venture of the private sector, it cannot put the people on the path of progress through its efforts alone. It is difficult to put to use such a complex technology through experimentation alone.

The situation with regard to education and training programs in the area of information technology, as well as the availability and procurement of software, is below expectation. In Ethiopia there are about 120 computer service providers with close to 5,000 computer technology professionals at their service. It is estimated that this number would increase to about 20,000 shortly. While 20 of the service-providing organizations have network links with international companies, the rest are local actors providing training services only. While many of the companies lack the administrative and financial capacity, a good majority of them operate at a level where they cannot provide job opportunities to engage the potential young labor force available to the country.

Of these quite a few have transformed themselves into training colleges without even effecting the necessary change both in quality and content, in effect becoming nothing more than day care centers (youthgartens) for the country's youth. The low quality of computer training/education in our country, when considered from the vantage point of the demands and needs of people around the world who are knowledgeable in the area, is not only a matter of serious concern but it also presents itself as tragic. Except for the efforts of a few, handful colleges and universities in this respect, the number of institutions who could go beyond solving our country's problems and be able to compete on the international market is almost nil, and the efforts they make to produce well trained youngsters are very weak. One need not go too far to realize the absence of knowledge in the area of computers and computer networking. Due to the lack of organizations capable of solving problems related to computer use and computer networking; due, also, to the low level of our confidence in the existing ones; we have been forced to pay our electricity bills for the past month using manually prepared receipts.

When we look at the country's information technology system from the perspective of a government institution's structure, the balance tips on the side of a fragmented arrangement. Ethiopia's information and technology sector has been organized, in a fragmented fashion, among the Ethiopian Information and Technology Authority, the Ethiopian Mass Media and Telecommunications Agency and the line ministries that are responsible for overseeing these institutions. The authority established to implement the information and technology project, although still working on its organizational structure, has not so far shown any indication of coordination in the information communication technology it is supposed to oversee. It therefore has to carefully study and consider which information technology projects should be given priority and, accordingly, implement them.

Most of the work in the area of information technology appears to have excluded the private sector form participation in the project; in fact it appears that all has been left to the Telecommunications Corporation to deal with by itself. A lot more could be said about such issues and the situation of information communication technology in Ethiopia. However, in consideration of the available space, it would suffice to focus only on some of the fundamental issues.

V. Information Communication Technology and Development: Some Basic Considerations

Of what use is information communication technology to countries such as ours? Why are we wasting our time and energy [bothering] with it? Why don't we simply focus on training additional teachers instead of buying computers? Of what interest is information technology to a people that suffers from malaria, tuberculosis, HIV/AIDS or agonizes in search of a mere morsel of food? It is common to hear such questions at meetings like this one.

First of all, I believe you are aware that this paper has as its focus our information and knowledge ecosystem rather than technology. Any project, plan or program that has technology in mind as its starting point is doomed to failure. If we give precedence of consideration to technology over grasping the nature of our problems, or if, as some consultancy experts suggest, we have as our goal the total routing of our educational,

health and poverty problems by means of new technologies, we are only going to repeat the Dergue's slogan of "bringing nature under our total control," thereby inviting upon ourselves the failure and doom of the most naive or the most inane of scatterbrains that one could think of. But we still witness, however occasionally, such naiveté as would accord prior consideration to technology being expressed.

For example, the kind of plasma education now being dished out in our high schools, using flat panel display, appears not to have given due consideration to the role of teachers, or the opportunities and limitations of technology, or it seems not to be aware of the experiences of countries elsewhere in the world. Although the motive behind this practice—supplying good teaches, providing the same level of education at a national level, etc.—is commendable on grounds of principle, prior experiences elsewhere have shown that a teaching method that is solely based on technology, with all the trappings that come with it, one, moreover, that has done away with the personal interface between students and teachers, is not adequate to satisfy the needs of the students. Research has shown that, unless teachers, health workers, library professionals, etc. serve as gatekeepers for the transmission of knowledge, unless, as I have pointed out earlier, knowledge is transmitted in the form of narrative and in a participatory mode, the learning outcome is bound to be low, pure and simple. In a scenario like this, when the computer breaks down or crushes, or when power failure occurs [as is often the case here], because it is difficult to resort to the previous method, we shall lose track of the educational enterprise and end up in total disarray.

Although networking our institutions of higher education through the Internet and equipping our youths with computer literacy have a crucial role to play in education, it is inevitable that the change brought about by giving precedence to technology over everything else would prove more disadvantageous than otherwise. To the same extent that there is no social research on technology application, it would be naive to assume that the wholesale setting up of computers in schools and all the way down at the Wereda level would bring about change on the educational system and its administration.

Although the school enrollment rate has grown over the past few years, our capacity to learn, or the effort made to raise the quality of knowledge that we disseminate to our youths, has remained low. The effort has been one of simply implementing orders, with injunctions, such as "you can't do that"; "it is forbidden"; or "it is an order." What we have done in the process is build the kind of capacity that places constraints on the system rather than one that encourages innovation. The attention we have given to research and scientific inquiry is low; the structures of our scientific endeavors have been limited. Because of all this, we have not been able to adapt the technologies manufactured elsewhere to our needs. If we add to these problems a technology that is not well considered on the basis of sound research, the whole effort will amount to adding insult to injury.

The new technologies now available to us must be so systematized as to increase our learning or educational output. As things stand now, achieving such a goal requires more patience than just equipping schools with computers. It took such Latin American countries as Chile and Costa Rica 15 years to equip their schools with computers, and the fact that they are just at their nascent stage towards reaping the profits should be a big lesson to draw upon for policy makers and their advisers of countries such as ours.

But all this does not at all mean that our education is in no need of technology. If students at our universities and tomorrow's apostles of technology are provided with adequate access to technology, if a student graduating in any discipline is made to secure information technology operating license and equipped with the capacity to use computers (e.g. if a person is an accountant and that person has knowledge of computer use in accounting; if a geographer and the person has knowledge of geographic(al) information system [GIS]; and if a health professional, the person has a general knowledge of telehealth,, if we could achieve all these, it would then mean that we have facilitated the way for the proper application of technology to enhance our growth and development. Developing countries such as Ethiopia should make it their goal to produce IT-literate citizens capable of applying information technology in the different sectors (agriculture, heath, education, etc.).

Instead of echoing, as is currently being witnessed in African countries, the 'slogan' that technology will help in the eradication of poverty and that it has a role to play in the attainment of the UN-prescribed millennium goals, it would be well advised to mainstream information technology in the various sectors of development. If, on the one hand, we enable our youths to acquire a more extensive and profound knowledge and steer those among them with the aptitude for information technology toward a more complex and practical (solution-oriented) information technology education and if, on the other hand, we create a favorable condition for professionals trained in the various disciplines to acquire sectoral IT licenses in their respective profession, we can benefit in two ways:

1. Producing a person with an aptitude for information technology and one who is properly trained in the field would mean that, not only would we have a labor force with internationally recognized and acceptable credentials, but that person would contributed to the growth of our economy and our foreign exchange earnings.
2. Those who are drawn together from the different sectors and are equipped with adequate knowledge about the application of information technology in the respective sectors would be in a position to chart new ways and create efficiency and effectiveness by using the technology already available to them, thereby contributing to growth of the different sectors of our economy.

For these to be realized:

1. The Government should not take too much time in designing policies and, instead, take measures in the direction of improvement (for example, it could create an enabling environment for the unlimited expansion of the existing Internet system at the universities and pave the way for the students to acquire adequate knowledge);
2. The Government and private organizations should provide incentives (e.g. bank loans, building convenient infrastructure, efficient telephone lines and Internet services, offices, etc.) to those Ethiopians equipped with adequate knowledge and encourage them to deploy themselves in information technology and software-providing services, and open the door for them to percolate in research institutions and technology parks;
3. The superficially attractive information technology education/training currently run by many of the private enterprises should be discontinued and replaced by the kind of education/training that is practically oriented and focused on the current, local and international market's needs and demands. This is something that should not be postponed any longer. Both the education/training currently provided in the field as well as the youths receiving the training should develop a sense and culture of entrepreneurship, team work, integrity, and accountability, all of which would help them in decision-making in their work. They should also be encouraged/ required not only to be creative but to develop the capacity to implement projects;
4. Favorable conditions must be created whereby our knowledge infrastructure, such as libraries, government information centers, the mass media, scientific journals, etc. could be strengthened and equipped with and supported by new technologies;
5. Favorable conditions should be created whereby social research could be undertaken on new technologies and the country's indigenous technologies, and whereby the findings could be disseminated for possible use by the people and policy makers; this should not be limited to the technologies but must also be so geared as to include the study of the effects of the technologies themselves on the cultures and languages of the people;
6. Create the conditions for instituting non-marketing awareness raising programs by different professionals, using the mass media;
7. Create conditions whereby the development of communication technology is undertaken through the concerted efforts of the Government, the community and small-scale private enterprises.

When conditions are created for the realization of all these, good results can be achieved.

VI. My Visions for Ethiopia

In this fast-paced Age of Information Technology, it is extremely difficult to prognosticate in any meaningful way what awaits us even in the coming twenty months, let alone twenty years down the line. Because the information technology cycle does not normally exceed 5 years, any vision as one might project and the policies ministering to that vision will have lost their significance after 5 years. Neither have earlier prognosticators been able to make precise projections. In 1949 Thomas Watson had predicted that the world market would have no demand for more than 5 computers. Even worse, predictions prior to that of Watson were made without taking into account the people's level of development and the capacities of the different countries, so that they proved to be nothing more than the dreams and pet phrases of information technology professionals. Although many underdeveloped countries, including Ethiopia, have incorporated such dreams in their technological policies, it has been difficult for them to translate their dreams into reality.

Consequently, what makes for a realistic vision, rather than projecting that any given new technology would grow and develop by so much in twenty years, is to ask, how much change technology would bring about in the day-to-day activities of our people? The plausible projection will have to do with the kinds of activities people working in the various sectors would undertake, conscious of the need for integrating and mainstreaming information communication technology in their day-to-day engagements. Still it is possible to make the following projections that could be realized over the next five years:

- I think, first of all, that the country's knowledge ecosystem would be strengthened and that the people of Ethiopia would become information-literate. It is my estimation that Ethiopia would be in possession of numerous libraries and centers for new technologies where hundreds of thousands of youths and adults would go to acquire knowledge and participate in the finding of solutions to the country's regional and local problems.
- Telecommunications services would grow from the current 0.7% to 3% of the population, while mobile telephone users would buy services from retail stores any time and any place they want.
- Internet services would proliferate throughout *Kebeles*, health stations and schools. I also believe that our country's farmers and merchants would be able to access the information they need via the Internet.
- Mass media enterprises will have developed self-confidence for the quality information they provide, at the same time cultivating the spirit of competitiveness. Ethiopia will have become home to reputable journalists and editors knowledgeable and versed in the different professions, such as agriculture, health, science, technology, and journalism itself. It is my vision that journalists would take themselves one level up and engage in news analysis instead of merely broadcasting what comes their way; I also believe that, instead of presenting programs individually, they would opt for the kind of teamwork that allows for the participation of professionals and the population at large.
- Ethiopia shall contribute to the world's information wealth of scientific research through the Internet. I envision a situation whereby international research institutes would flock to the country, with reverence to its peoples' hospitality and sheer amazement of its knowledge ecosystem, to collaborate with their Ethiopian counterparts.
- I believe that enterprises working in the area of developing information and communication--that is, the Broadcasting and Telecommunications Agency and Information Technology Authority--would merge and work toward the creation of favorable conditions for the application of different technologies in seeking solutions to the country's poverty situation and bringing about economic growth.
- It is my wish to see our indigenous knowledge systems brought out into the open and organized and systematized in the service of our country's growth and the development of its peoples.
- It is my estimate that our content industries would be strengthened and be accessible to our people and international consumers, in the process,

contributing to our economy and culture.

- Every professional will be computer-literate. Ethiopia will have universities, research institutes, IT business incubation centers that will facilitate information technology activities and create new businesses, as well as information technology parks. In these parks, Ethiopians residing abroad, citizens of other countries and our youths will mange to solve the problems of their country, of their continent and of the rest of the world through the dissemination and application of new technological research results. The parks will serve as locations where knowledge shall be transmitted and disseminated without any constraint or fear.
- Our country will have a center where social research shall be undertaken in the areas of information, knowledge, communications, and new technologies. Research findings from this center shall be used for policy design and development.
- Accordingly, the contribution information communication technology makes to our gross national product shall grow from the current level of 2% to over 5%

Finally, I believe that the aims of our information system should focus on three fundamental issues:

1. Transform our information infrastructure, i.e. our libraries, information resource centers equipped with computers and Internet services, enhance our indigenous knowledge systems through the application of research findings, improve our knowledge density and, ultimately, build a knowledge-consumer society;
2. Increase the number of knowledge entrepreneurs by providing extensive and quality education in information communication technology, calibrating the quality level with that of the rest of the world, and producing professionals capable of creating solution-generating applications
3. It is imperative that support be given to all professionals by providing them with education and training in information communication technology in the various sectors (i.e. agriculture, health, psychology, etc.) in order to enable them become technology users and solution generators in the respective sectors as well as information producers and knowledge workers.

It is impossible in this age of globalization to remain an island. Accordingly, if it is our desire that our country has its share of the pie in the world's knowledge economy, there is no alternative but to embark on the task of producing knowledge workers, knowledge entrepreneurs, and knowledge users.

Third Round Next "Vision 2020 Ethiopia" Schedule

Dr. Aklilu Kidanu - January 28, 2005
Dr. Tadesse Biru Kersmo - February 25, 2005
Ato Bekele Bayissa - March 25, 2005
Weiz. Zeritu Neda/ato endashaw alemayehu - April 28, 2005
Prof. Seyoum Tefera - May 27, 2005
Ato Neway Gebre Ab - June 24, 2005