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Dawit Bekele
Addis Ababa University

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Impact of Government Policies on the Development of ICT in Ethiopia

Dawit Bekele
Mathematics Department
Addis Ababa University

1. Introduction

During the last decades Information and Communication Technology (ICT) has changed the lives of a vast portion of the world's population. Beyond any doubt, the impact of ICT on the human civilization will continue to be very important for decades to come.

During the last five decades, developed countries have used ICT to improve their production efficiency that was already considerably improved during the last two centuries, thanks to the agricultural and industrial revolutions. The citizens of these countries have thus been able to enjoy quality of life that human kind never experienced in the past.

Unfortunately, during the same period, most third world countries, including Ethiopia, have done very little to increase ICT penetration in their countries. It is therefore not surprising that their production efficiency has remained almost as low as it was five decades ago. Since most of these countries also have very high population growth, the quality of life of the majority of their population is in fact deteriorating instead of improving. Consequently, these countries are facing more and more economic, social and political problems that have put them on the verge of complete collapse.

ICT is not panacea that can solve every problem of a society. But, most development experts accept that ICT can assist poor countries in solving most of their economic, social and political problems. It also brings new development opportunities for poor countries, as was the case of all technological inventions.

It is sad to note that Ethiopia, as is the case with many developing countries, is not taking timely advantage of the opportunities brought about by ICT. In the past, the cost of ICT equipment could be considered as the major hindrance preventing the popularization of ICT in developing countries. But, today, with the fall of the price of computers and communication equipments, it can no more be considered as the primary inhibitive factor. On the other hand, it is becoming increasingly evident that local policies of the developing countries are in fact the major hindrances for the development of ICT in their country.

This article envisages examining some policies that Ethiopia pursues that bear direct or indirect impact on the development of ICT in the country. It will also propose alternative policies that the author believes can help in improving penetration of ICT in the country.

2. ICT and development

One of the main reason why ICT is not developed in Ethiopia is due to the fact that for decades, it has been considered a luxury by the general population and, most importantly, by high government officials, heads of private and government organizations, etc. It is therefore appropriate to clarify the role that ICT can play in solving the development problems of the country, before talking about policies for ICT development.

Ethiopia, being one of the poorest countries of the world, faces a wide range of problems that it has to deal with in order to give its population an acceptable leaving condition. Some of the major problems are:

- **Poverty:** Ethiopia has one of the lowest GNP per capita in the world (around US \$110). Most of its population lives in absolute poverty.
- **Illiteracy:** Only 35% of its population is literate.
- **Poor education:** A high percentage of its population does not get access to education. Successive governments claim that they have improved access to education for the citizens, but it is undeniable that the quality of education has dramatically fallen starting from the 1970s. The situation is so dramatic that today's average public high school graduate has acquired less knowledge in school than a primary school graduate some forty years ago, especially with regards to languages and general knowledge.
- **Poor health system:** Public health facilities, which are the only health facilities that are still affordable by the majority of the population, can no longer cope with the alarming increase in the number of patients. Budget limitations and the scarcity of health professional are also some of the major problems. Brain drain in the health sector is becoming increasingly acute due to the very unattractive local working conditions, and high demand for health professional in developed countries.
- **Poor public service:** the Ethiopian public service has become a major bottleneck for the whole economy. Today, it takes several years to process simple papers in government offices. For example, legalizing property transactions at the municipality is generally a painful activity that needs several days of queuing in front of overcrowded offices and that takes several years to complete.
- **Low industrial production:** The country produces a small portion only of the industrial products it consumes. Its export of industrial products is virtually nil.
- **Inefficient agricultural production:** Most of Ethiopia's population (more than 80%) are farmers. Nevertheless, the country is not food self sufficient due to inefficient agricultural methods and tools that the farmers use.
- **Bad governance:** partly due to the inefficiency of the public service, citizens of Ethiopia are not getting the basic rights promised in the constitution. For example, due to the inefficient judiciary system, some falsely accused suspects stay in jail for years before their case is brought in front of a judge that sets them free.

As it can be seen above, the challenges of Ethiopia are immense and any sensible policy maker should use all opportunities that can help tackle the problems.

The following benefits can be achieved in Ethiopia by implementing ICT:

- **Increased efficiency:** A major cause of most socio-economic development problems indicated above arise from work inefficiency. For example, one of the bottlenecks in public organizations is the archive, where all documents are stored. Often, it takes days to find a file since it is displaced or

simply because the filing system is not properly organized. Computerization can shorten this time several thousands times. Simple databases that can be accessed by all employees that need the data can dramatically improve the currently inefficient information system within government organizations.

ICT can also improve the use of the scarce resources. For example, most government offices use couriers to exchange reports that could instead be sent more easily, more cheaply and more quickly using networks such as the Internet.

- Increased knowledge acquisition and dissemination: Lack of knowledge is another major cause of the development problems. The problem in the education field comes mainly because the teachers themselves are not properly trained and they do not have the required means to improve their knowledge. Students have very little source to improve their knowledge. The agricultural and industrial sectors are suffering partly because the farmers and the industrialists don't get major knowledge that can help them improve their methods. ICT (ex: Internet) can help in bringing knowledge from the knowledge rich countries, but also disseminate the knowledge to the population. For example, national school computer networks can bring to the schools up-to-date teaching materials that can help the schools improve the quality of the education they provide to their students. Likewise, new technologies can be brought to farmers and industrialists at very little cost.
- Improved access to information: many of the problems of the public sector stem from the lack of adequate access to public information by the public at large. ICT can improve this situation by bringing up-to-date information to the public. For example, corruption which is one of the major problems that paralyze the public sector and greatly contribute to bad governance, can only proliferate in organizations that hide information. On the other hand, transparency helps organizations fight against corruption. As the Prime Minister once said, transparency is the worst enemy of corruption. ICT cannot by itself create transparency but it can help a determined government to create transparency. For instance, in a country where Internet is widely used, any organization that wants to provide information to the public can achieve that goal by establishing a web site at minimum cost.

3. Current situation of ICT in Ethiopia

It can be said that ICT infrastructure in Ethiopia is very much under developed even compared with countries at similar development stage. In particular:

- The number of computers in the country is still low in spite of the continuous fall of prices of computer equipment. This is not only due to the limited purchasing power of the population but also because computers are considered as luxury items.
- Existing computers are highly underutilized. More and more organizations are allocating budget to buy computer hardware and sometimes provide training for their staff. But very few allocate sufficient fund for software and for consultants fees. For this reason, the majority of the computers in the country could not give more service than an ordinary typewriter. For example, it is quite common for a government organization to use the allocated budget just to buy the "latest PC" without knowing what it is going to do with it.
- Very little is done to develop ICT human resource. Currently only three units of Addis Ababa University offer ICT related programs.
 - ◆ The mathematics department offers degree and diploma undergraduate programs in computer science.
 - ◆ SISA (School of Information Studies for Africa) offers information science graduate program.

- ◆ Electrical Engineering department offers computer engineering degree program.

The combined output of graduates of these units does not exceed 80 students/year. Other public colleges such as Mekele College and Debre Zeit Military College have also shown interest to start computer science programs. Nevertheless, their programs are not yet operational. On the positive, private colleges such as HILCOE and MICROLINK have started offering computer science programs. Nevertheless, they have a problem of obtaining competent instructors. The assistance they get from the government is also limited. For instance, in spite of the positive policy of the government that provides land for free for educational institutions, very few of the many colleges have been granted land at the present time, mainly due to bureaucratic bottlenecks.

Due to the limited number of institutions offering ICT programs, the number of graduates is very small compared to the high demand for graduates in these fields. As a result, only organizations that can offer very high salaries (Non Governmental Aid Organizations and International Organization mainly) have the chance to hire graduates from ICT related programs. For example, it has become almost impossible for government organizations to hire computer science graduates. Thus, they often use existing staff with little or no training in the field.

- Computerization of activities: In spite of all shortfalls, it is undeniable that the number of computers in the country, is increasing. Nevertheless, very few activities are being computerized. Most government offices continue using the old manual operations to carry out their daily activities. This is because most organizations still do not have a good understanding of computerization. In general, they believe that computerization consists of only purchasing computer hardware. In practice, they allocate little or no resource for software and consultancy. As a result, most computerization projects do not contribute considerably in the increase of the efficiency of the organizations.
- Participation of government organizations in the development of ICT: The government was involved in ICT development through at least two agencies: namely the Ethiopian Science and Technology commission (ESTC) and the Ethiopian Telecommunication Corporation (ETC). During the 1980s, ESTC has been at the forefront of the introduction and adaption of some of the IT technologies in the country. ETC, that has been the sole provider of telecommunications services for the past decades, has expanded its span of activity to Internet.

Unfortunately, both agencies could not fulfill their objectives due to organizational problems. In the 1990s, the ESTC reduced its activities in the IT area considerably and limited its involvement to major national issues, such as the Y2K problem and the development of the National IT policy. In addition, the ESTC offers technical assistance to other organizations in developing their ICT infrastructure (ex: Ethiopian parliament).

The ETC, on the other hand, still holds total monopoly on all telecommunication and Internet service. Nevertheless, despite repetitive promises, the ETC could not satisfy the demand in all sectors of its activity. Especially in the Internet area, the corporation has not only been able to provide access to a large number of applicants but has also failed to give an acceptable quality of service to the current subscribers.

- Participation of private organizations in the development of ICT: most private companies working in this area are engaged in import and sales of computer equipment and provision of primary users training. A few software development companies have started here and there, but only few managed to stay in market for long. The difficulties facing software developers stems mainly from lack of appreciation by potential user organizations in the country. Very few private companies attempt to get involved in the communications area due to the prohibitive policies. Even minor activities such as Internet Service Retails (cyber cafés) are still reserved for the ETC. Since, no hardware manufacturing factories exist all computers used in the country are imported.

- **Telecommunication Infrastructure:** The telecommunication infrastructure remains unsatisfactory ranking at the bottom of the world, despite the undeniable efforts of the ETC to develop telephone services, especially in remote towns. Only 3 in 1000 persons have access to a telephone, 3 in 100,000 persons have access to Internet and 3 in 10,000 have access to mobile phone.

4. Current policy problems related to ICT

Telecommunications

The major obstacle blocking the development of ICT in the country is the monopoly that the state holds for provision of telecommunication services. In spite of a law that was passed by the Parliament more than three year ago allowing private companies to participate in the provision of mobile, Internet, data communication services by purchasing licenses from the Ethiopian Telecommunication Agency (ETA), it is not still possible for any private company to work in this sector. It seems that the government continues to favor the income it generates as a sole provider of these services rather than development of the sector through participation of the private sector.

Computer Hardware and software

Import of computer hardware and software is still taxed. Although import tax on computer hardware is relatively low, parts are heavily taxed. As a result, investment on computer hardware manufacturing and assembly is discouraged. Hence, the prices of computers are higher than the international prices.

As for software, nothing is done to establish and enforce pertinent software copyright laws. Hence, local software producers are obliged to use complex piracy protection mechanisms which are not always reliable. For this reason, the environment is not conducive to potential software producers, thus creating a situation which cripples the whole computerization effort of the country.

Furthermore, due to acute lack of awareness that most managers and owners have regarding the use of software, only few organizations accept to pay even the relatively low price for software development. Consequently, most organizations possess only bare computers without the necessary software required for the computerization of their activities.

Human resource development

As indicated earlier, an acute shortage of human resource prevails in the ICT area. Although this is a well known fact, the government has not yet defined a clear policy on ICT related human resource development. For instance, ICT related education is not given the same degree of importance given to education and research in agriculture. Hence, it is feared that even the existing ICT education programs, especially those in government higher education institutions, may be abandoned altogether. A glaring example that justifies the foregoing fear is that the Addis Ababa University could not obtain the necessary fund to purchase new computers for the computer science laboratories and to pay their maintenance while hundred of thousands of Birr is allocated to equip and maintain older laboratories (chemistry, biology...).

Integrated national ICT development strategy

At the national level, one major constraint preventing accelerated growth may be attributed to the lack of an integrated national ICT development strategy. As a result, each organization implementing computerization is required to find its own solutions. For example, almost every organization, government or private, needs to computerize its payroll, stock management, management information system. Likewise they need software to use Ge'ez script in computers. Those organizations with dispersed offices also need to use ICT for information exchange between their offices. In these endeavors, there is virtually no exchange of experience resulting in unnecessary duplication of efforts and waste of resources. For example, the Ministry of Agriculture's National Agricultural Information System is a huge project that tries to establish a nation

wide computer network. At the same time, the ETC is also striving to form a similar network that will be connected to the Internet, and that will be used by the general public. It would have been more economical to mobilize these resources in order to establish a single national network that can be used by all sectors.

5. Alternative ICT policies for Ethiopia

Presently, what little policy exists relating to ICT has evidently proved non conducive for development of ICT in the country. As a result, Ethiopia is not getting the benefits and opportunities that these technologies can offer. Therefore, it is high time for government to make major policy changes with regard to ICT. Some alternative policies believed to accelerate the development of ICT are proposed hereunder.

Liberalization of the telecommunication sector

It is virtually impossible to make any tangible progress in ICT before the necessary improvements are made to the telecommunication infrastructure and services. Ethiopia's history as well as experiences of other countries has shown clearly that state monopoly does not in any way help the development of telecommunication services. On the contrary, state monopoly creates shortage and poor services. It is a gross mistake to believe that progress in this sector can be achieved and stay abreast with other countries in the world, by maintaining state monopoly.

Some policy makers justify state monopoly by the special nature of telecommunications services that require monopoly to run efficiently. That may be true in the past, but today, with wireless telecommunication technology, there is virtually no area of this sector, including local loops, that requires monopoly.

Therefore, it is strongly recommended to liberalize the service so that private companies may be encouraged and motivated to invest in the telecommunications field. It is said that the government is heading towards establishing "strategic partner" while maintaining current monopoly. This may improve the situation, but it still continues to deny the market the benefits of fair competition.

Aggressive ICT human resource development

There should be a national education policy that favors ICT human resource development. Public universities should be granted adequate funds not limited to run the existing programs but also helps to start new ones. Private colleges should also be encouraged to start programs in ICT related fields at all levels of education.

Furthermore, all higher institution programs should contain ICT courses that will enable graduates to use and take part in the development of ICT in their field of activity. For example, management students should learn the importance of ICT and it can be used to improve the performance of the organization they manage. Finally, there should be a nationwide strategy to promote ICT awareness and skills of the workforce.

ICT Infrastructure development

There should be an aggressive national policy addressing ICT infrastructural development with priorities given to improving telecommunication services, to enable better access to computers for citizens and to encourage establishment of appropriate software and hardware industry. The concerned authorities should realize that on the long term the country will benefit more from a well developed ICT than it currently generates through import taxes imposed on ICT equipment or state monopoly on the sector as a whole.

It should be understood that development of the country's ICT infrastructure is not limited to advance domestic economic growth but will also attract foreign investment that the country desperately needs. On the contrary, if nothing is done to improve ICT infrastructure, we must face the grim fact that even the limited number of investors may be forced to leave the country since it is becoming increasingly difficult to work efficiently in any sector without ICT.

Enabling environment for development of ICT industry

It is neither realistic nor fair to expect the government to undertake the entire ICT development endeavors all by itself. The main role of the government should be to create an enabling environment for development of ICT industry. This can be achieved by providing tax incentives for investors engaged in the sectors and removing certain bureaucratic bottlenecks that so far have been a major obstacle. Since there are many potential entrepreneurs that lack resources for the implementation of their ideas, financial resources should also be availed to them.

National Standards should be established to facilitate interoperability of computer hardware and software. In particular, since most Ethiopians use the Geez script for their writing system, character encoding and keyboard standards for the script are urgently needed.

Increased access to Internet

There is no doubt that the Internet is becoming a gold mine of resources to those who wish to improve their knowledge. By providing easy Internet access to the general public at an affordable cost, the country will move one step towards solving many of its development challenges. For example, the education sector will benefit because instructors and students, even in the remote areas, will get up-to-date teaching materials. Furthermore, teachers and students alike can to exchange knowledge with other teacher and students all over the world.

The very low economic power of the population is probably a major barrier preventing popular Internet access in the country. To counteract this shortcoming, community Internet access centers should be highly encouraged. In addition, there should be a national plan to provide universal Internet access for all citizens, through community centers. This effort should not be considered as an unrealistic goal, since wireless technology enables the provision of telephone and Internet services even to very remote areas at affordable cost.

Greater use of proper ICT in the public sector

The public sector should be a model user of ICT. By using ICT, the public sector will also improve its own operational efficiency, which currently is dangerously low. In addition, this move brings more businesses to the ICT thereby offering the field more opportunity to grow. The government agencies should adopt complete ICT solutions that are appropriately designed to handle their day to day activities. Otherwise, instead of being models that encourage others to use ICT, they may contribute towards dissuading them.

Furthermore, the use of ICT in the public sector helps to bringing good governance by enhancing transparency, thereby giving more opportunity for citizens to participate in public affairs. Such practice also helps to fight the major disease in the public sector: namely corruption.

Using opportunities offered by the information age

The information revolution is literally changing the face of the world. In terms of geography, it has eliminated the distance barrier that existed between peoples living in different parts of the world. This breakthrough has already opened new opportunities that many countries are using. For example, India and Ireland are both benefiting tremendously from off shore software development. Some companies based in developed countries are literally moving their accounting departments to developing countries where inexpensive but qualified labor and good ICT infrastructure exists.

These opportunities, like all opportunities, will not last forever. Therefore, the government should conduct a thorough evaluation of all opportunities that can be used by Ethiopia, considering the economic, social and other situations of the country, and create enabling situation by providing the necessary assistance to those companies that seek to exploit these opportunities.

6. Conclusion

Ethiopia, as one of the poorest countries in the world faces a number of economic, social and political problems that continue to adversely affect the quality of life of its population. ICT can bring some means that can be used to solve many of the problems and help to make a sustainable change. Therefore, it is high time that national policies which have so inhibited rapid advancement of ICT are replaced with policies that are more conducive for their development. It is a good sign that the government has currently established a national ICT committee and has prepared a draft national ICT policy. Nevertheless, it should be prepared to take concrete actions such as liberalizing the telecommunications and Internet areas in order to have positive results.

There is a cost associated with developing ICT. However this cost is far less than the prize one pays by not developing ICT. To say the least, without proper ICT infrastructure and environment, the country will not only fail to benefit from global opportunities, but will also face the risk of being marginalized furthermore from the world's economy.

Ethiopia should therefore establish effective policies to create an environment for the development of ICT. It should also enact laws and regulations to implement those policies within a very short period. Otherwise, after having missed development opportunities brought by the agricultural and industrial revolution, Ethiopia will miss the opportunities it is given by the Information revolution.

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