The States of Sub Saharan Africa on the way to the Global Information Society

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ABSTRACT

The paper devotes to the problem of overcoming of the digital divide in the Sub Saharan African States. On the example of Kenya the author speaks about the comparative success of the development of the information technologies in Africa and in turn underlines the most significant obstacles on the way of African states to the global information society and suggests the means how to overcome them.

Keywords: Sub Saharan African states, information society, information and communication technologies, information policy.

1. INTRODUCTION

The present level of the development of the information technologies in Africa doesn't make it possible for the States of Sub Saharan Africa to integrate in to the global information society. This is due to several reasons, but the principal one is that there is lack of well considered strategies of the formation of the information society in African states which would be fixed in official documents.

Today we can ascertain that the States of Sub Saharan Africa begin to pay increased attention to the problem of the proliferation of information technologies in their national policy. To our opinion, this policy is not aimed at the raising up the living standards of ordinary African people, but at the reduction of the digital divide from the well developed states in order to possess equal rights in the international relations. In that case they are speaking about the development of the information and communication technologies (ICT) in urban areas whereas the rural areas are staying completely undeveloped. That's why we can conclude that the most significant obstacle on the way of the Sub Saharan African States to the information society is the problem of internal digital divide between urban and rural areas. It is clear enough that the presence of the ICT in big cities doesn't indicate the level of the e-readiness of the country in a whole. Our point is that they can construct the information society only in case if every human being from every part of the country will have an access to the ICT. And only after overcoming the internal digital gap between rural and urban areas the country will be able to pretend to the possessing place in the global information society.

In this paper we propose the overview of the problem of digital divide basing on the example of Kenya.

We have chosen this country due to several reasons. Firstly, Kenya is one of the most developed countries in the region and has been pursuing a consecutive informational policy for at least ten years. But the final realization of the informational policy had met the same obstacles in Kenya as in the vast majority of African states. Therewith we have been in Kenya in April 2010 and had a chance to measure the real level of the development of the ICT in the country.

2. BRIDGING THE DIGITAL DIVIDE

The problem of the overcoming of the digital gap is one of the most important problems of the social and economic development of African States which was mentioned in the Program of the New Partnership for Africa's Development (NEPAD) in 2001 as the key factor of the sustainable growth of the States of Sub Saharan Africa [1]. This disposition was further reflected in different national strategic visions of the development.

For example in Kenya "Vision 2030", which seems to be the most general official document aimed at the coming up to the sustainable social and economic growth by the year 2030, which was adopted in January 2007, they have underlined three pillars on which the social and economic development of the country is based: the economic one, the social one and the political one.

Figure 1. *Thematic overview of the Kenya Vision 2030*
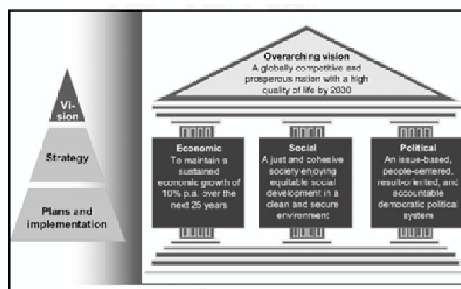
And ICT forms, according to the "Vision 2030", the backbone of each pillar [2]. That's why the elaboration of ICT sector in Kenya seems to be one of the major priorities of the national development.

The National Information and Communication Policy of Kenya have been elaborated by the Ministry of Information and Communications in the early 2006. This document has outlined the major priorities in the development of the ICT sector.

Challenges of the development of ICT: Kenyan view

To our opinion the most important point of the National Information and Communication Policy of Kenya comes to the declaration of the private-public partnership in the ICT sector. That means that the private sector is responsible for the creation and modernization of the adequate ICT infrastructure and for ensuring the universal Internet access. But the government should regulate the activity of private companies and create a favorable environment for private investors. That's why it is obvious that the creation of an adequate legislative base is one of the most important tasks of the Kenyan Government.

The National Information Policy of Kenya has underlined a number of key strategies in the further development of the ICT which should be implemented in every country which pretend to the equal integration into the global society of knowledge. In the present research we'd like to stop on the most significant of them.

Policy, legal and regulatory framework: In the Information and Communication Policy of Kenya they notice that the present Kenyan legislative base is rather poor and inadequate and can't regulate the permanently transforming and modernizing information relations. That's why there is necessary to elaborate and adopt the new legislative base and a regulatory framework in order to support the development of the ICT sector of the country, to promote competition in the industry and to support researches in the field of ICT.

ICT infrastructure: It is clear enough that the lack of adequate ICT infrastructure put the serious obstacle on the way of the provision of the ICT services in the country. Thereupon the Kenyan government underlines the necessity of the development of the whole system of the ICT infrastructure including the support infrastructure such as energy and roads, the country wide optical fiber network and the software and hardware development.

Human resource development: The Kenya government recognizes that the human resource development play an important role in the social and economic development of the country. That's why the government declares the necessity to promote ICT in primary and secondary schools, to set up a framework for evaluating and certifying ICT training programs and courses and to develop a mechanism for attracting and retaining skilled human resources

E-learning: In order to develop the Kenyan national e-learning platform the government recognizes that it is necessary, firstly, to provide an affordable infrastructure and to promote the development of local digital content aimed at the educational needs of primary, secondary and tertiary institutions. Secondly, the government should facilitate sharing of e-learning resources between institutions. And, finally, it will be necessary to integrate e-learning resources with other existing resources.

Universal access: In the National Information and Communication Policy of Kenya they recognize that nowadays the access to ICT services is mostly limited by a few major towns leaving out the rural areas of the country where most Kenyans live. In order to ensure the universal access to the ICT services all over the country,

not only in Nairobi, Mombasa and some other more or less big and significant towns of the country, the Kenyan government has obliged to supply the national ICT sector by adequate resources, to develop the requisite ICT infrastructure and to elaborate incentives for service providers to deploy services in rural areas.

E-government: The Kenya government declares the necessity of the development of the key principals of the concept of the e-government in order to provide governmental services in an efficient and effective way. It is clear enough that the e-governmental platform simplifies the communication and information provision within Government, with the citizenry and the business community. But in order to unroll the e-governmental platform, from one side, it will be necessary to develop an adequate capacity within the Government, to provide required skills for the staff and, from another side, to ensure the universal ICT access for the vast majority of Kenyans, especially those, who live in rural areas. But it is obvious that the simple availability of the public ICT access centers and the technical opportunity to connect every computer to the Internet all over the country won't set the tremendous growth of the usage of ICT services itself without elaborating the effective national programs of the modernization of rural primary and secondary schools. Only in that case there will be possible to grow up the new generation of citizenry who realize the benefits of the everyday usage of ICT services and e-government platform in particular. Nowadays as far as we could observe during our research undertaken in Kenya in April 2010, even a vast majority of school-leavers from expensive private schools don't know how to use the modern computer technologies.

E-commerce: The Kenyan government recognizes the importance of the implementation of the e-commerce service. Thereupon they declare the necessity of elaboration and adoption of an adequate legislation in order to create a favorable environment for the development of e-commerce.

The development of local digital content: The Kenya government compares the ICT with a conveyor of information which provides opportunities for local people to communicate with each other expressing there own ideas, knowledge, heritage and culture in their own languages. In order to achieve this goal the Government proclaims the development of national digital content in local languages and to stir up the process of convergence of the local cultural heritage.

Electronic security: It is necessary to underline that nowadays the problem of e-security has become an important feature of the national security. That's why the Kenyan government declares the necessity of the establishment of an adequate national legislative base in order to ensure the network security, the reduction of cyber-crimes and terrorism, and to establish legislative mechanisms for international cooperation to combat cross-border crimes.

Kenya on the way to the information society: problems and prospects

As one can understand from the above mentioned documents Kenya government attach great importance to

the development of the ICT sector in the country. This policy take place from the year 1980 when they have published an official report considered the further development of scientific and research centers of the country. In this document they had mentioned that without development of the national science it was completely impossible even to speak about the independent development of Kenya. And they recognized the dependence from foreign researches, which extremely serves foreign interests but not national ones. That's why the Government has recommended to the research centers such as University of Nairobi and Kenyatta University College, which have the greatest concentration of scientists in Kenya, to involve personnel in a collaborative effort to identify problems requiring research attention and in devising research strategies and developing research programs [4]. But the development of the national research foundation has stroked on the lack of financial base.

Nowadays in order to ensure the realization of the "Vision 2030" and the National Information and Communication Policy the Kenyan government has adopted a number of national strategies and action plans devoted to the development of ICT in the country.

Thus the Ministry of Information and Communications of Kenya has elaborated the Strategic Plan 2008-2012 which produces a strategic middle term point of view how to develop Kenya as a globally competitive and prosperous nation by creating an enabling environment that encourages and enhances the development, expansion and usage of the ICT. In order to achieve this mission the Strategic Plan underlines three key strategies:

1. To improve universal access to ICT services to the public by developing the appropriate infrastructure, establishing digital villages and providing affordable ICT hardware and software.

2. To build the human capacity within the ICT sector through establishment of ICT training programs.

3. To enable public service provision through e-government [5]

Another document of that kind is the Strategic Plan of the development of ICT sector for the period 2008-2013, elaborated by the Communication Commission of Kenya. The mission statement of this document is to facilitate access to communication services through enabling regulation and catalyze the country's socio-economic development [6].

In order to obtain the main goals proclaimed in the above mentioned official documents the Government has set up a number of ICT strategies aimed on the development of ICT.

Indeed the reforms of the ICT sector in Kenya have started in the early 1998 when the Kenya Communication Act has been adopted. This Act put the end of the monopoly on the communication market of the State Postal and Telecommunication Corporation. The Act proclaimed the creation of Postal Corporation of Kenya, the Telecom Kenya Limited and the Communication Commission of Kenya. The Commission should become the regulatory authority for the communication sector in Kenya. Its initial mandate, proclaimed in the Act of 1998 consisted in regulation of the telecommunications and

postal subsectors and in the management of the country's radiofrequency spectrum [7]. Ten years later the Kenya Communications (Amendment) Act 2009 had extended the power of the Commission which has become not only the regulatory authority responsible only for the licensing of service providers and other telecommunication companies but also for facilitating the development of the information and communications sectors (including broadcasting, multimedia, telecommunications and postal services) and electronic commerce [8]. Besides the Commission is responsible for the annual monitoring of the intensity of the ICT development in Kenya basing on which it elaborates recommendations how to improve the situation.

During our time being in Kenya we could supervise that Kenyan Government was able to make a comparative success in the development of the ICT sector. Though according to data produced by the International Telecommunication Union (ITU) nowadays Kenya by the level of the development of ICT sector rank only 116 position in the global rating of the countries [9].

As we could ascertain on our own experience the mobile telephony is rather developed in the country. According to recent data in December 2009 they fixed about 19.5 miln. of mobile subscribers. This fact gives us an opportunity to conclude that about 50 % of the Kenyans use mobile telephones [10].

Nowadays in Kenya there are fore main private mobile operators, but all of them belong to the foreign investors. For example Safaricom is a joint venture with British corporation Vodafone, Zein belongs to the investors from Kuweit, Yu – to the investors from India, and Orange is a branch of the French mobile operator Orange which is a part of the French Telecom. And even the vast majority of shares (51%) of Telecom Kenya which used to be a national telecommunication corporation belong to the French Telecom. Thus we can conclude that the Kenyan information and communication space is fully handed to the foreign investors.

Therewith the development of the mobile communication which has been declared and the attraction of big private investors don't mean that the significant part of the country will get the mobile coverage in the nearest future. The figure below demonstrates that only the south of the country has the mobile coverage.

Figure 2. Mobile coverage
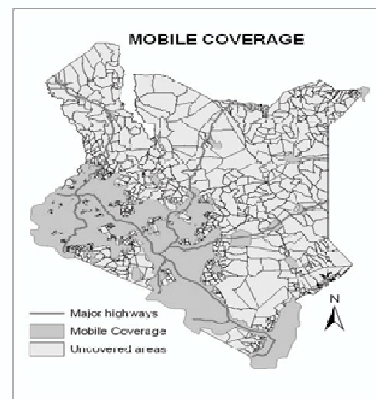
As regards to Internet we can conclude that despite all the efforts undertaken by the Government nowadays only 9 % of the Kenyans have the fixed Internet access especially in Nairobi, Mombasa, Kisumu, Nahuru and some other more or less big towns[11].

The breakthrough of the development of the broad band Internet has happened in the year 2008 when they have finished the submarine cable system going from Johannesburg through Mombasa to the Emirates. The shutdown of this project made it possible to reduce the tariffs for Internet access. Telecom Kenya and Kenya Data Network, two biggest Kenyan service providers have begun to construct a ramified optic fiber cable system in order to assure the access for the high speed Internet. According to the general strategic plan they are going to expand the broad band Internet over 80 % of the territory of the country. But for the moment there are few backbone optic fiber lines from Mombasa passing through Nairobi via Kisumu [12].

Besides there is a serious problem on the way of the spreading of high speed Internet all over the country – almost complete absence of the technical solution of the "technology of last mile" which seems to become necessary in order to realize the governmental strategy aimed at the connection of every village to the global network.

Nowadays all mobile operators provide a 3 G mobile Internet which in theory can give an opportunity of the Internet access in the whole region which is under the mobile coverage. But even in the developed south and center parts of the country there are a great number of villages without electricity where it is completely impossible to use personal computers. That's why we can conclude that the problem of the electrification of African villages still remains one of the most serious obstacles on the way of the spreading of the ICT in the rural areas. In urban areas the Internet is more or less well developed but still it isn't very fast. For example in Nairobi the average speed of the Internet, even in University campus which has connection to the optical fiber cable comes to 512 bit/sek. And it is rather low.

The Kenyan government pays great attention to the development of the e-government strategy. The Government believes that the achievement of the strategy will help:

1. Improve collaboration between government agencies through reduction in the duplication of efforts, and enhance efficiency and effectiveness of resource utilization;

2. Improve Kenya's competitiveness by providing timely information and delivery of government services;

3. Reduce transaction costs for the government, citizens and the private sector through the provision of products and services electronically;

4. Provide an opportunity for citizens to participate in Government activities [14].

The Kenyan Government has established the specific e-government Program in June 2004. Firstly the realization of the strategy has supposed the complete modernization of the national government itself. Now all governmental Ministries dispose of there own Internet sites and every year they sent a significant number of employees from Ministries to attend special courses of computer literacy [13]. Besides they have initiated the process of procurement of new computers and the construction of Optical fiber-based Government Common Core Network which must connect all governmental Ministries between each other.

But never the less there are serious obstacles on the way of realization of the strategy:

1. The process of procurement of new computers is bureaucratic and slow. Besides end-user software and hardware are not centralized.

2. Quality of the network infrastructure isn't sufficient for the complete realization of the strategy because of low speeds and limited network management.

3. As a rule the modernization concerns only central governmental Ministries in Nairobi whereas local ones stay fully unmodernized. Besides the vast majority of local governmental structures know about the implementation of the e-government strategy from mass media but not from the special governmental circulars what witness the bad communication between central and local governmental structures [16].

In addition the realization of the e-government strategy depends from the arrangement of the Universal Internet access in order to let the Kenyans to use governmental services electronically. That's why in 2007 they have launched the Digital village project which supposes to organize a public Internet access points in almost every Kenyan village.

But in our opinion such points will be demanded only in case of growth of the educational level of the Kenyans. That's why it comes to be clear enough that all the most popular modern Internet services, including e-government, will become popular only in case of the capital reform in educational sector and the comprehensive penetration of the ICT in the educational process in all levels.

The Kenyan government understands that in order to ensure the usage of all Internet services it is necessary to stimulate the development of the ICT in high, secondary and even elementary schools.

That's why in 1999 there was established the National Research and education network the Kenya Education Network Trust (KENET) which is responsible for the development of the ICT in educational sector and for the improvement of the information exchange between Kenyan universities and research centers.

The KENET aims to interconnect all the Kenyan universities and research centers by setting up a cost effective and sustainable private network with high speed access to the Internet. Besides, the KENET facilitates electronic communication among students, researches and faculties in member institutions [16].

Nowadays KENET provides the high speed Internet access to 42 member institutions for a monthly cost of 2330 USD instead of the commercial price of 3000 USD. Besides KENET is a founding member of the UbuntuNet and now negotiates for the direct access to the East African submarine optical fiber cable system in order to further reduction of the cost for international Internet bandwidth to its member institutions. Apart of the basic service of providing Internet access to the member universities and research centers, KENET aims to transform and strengthen its member institutions by

actively promoting the usage of the ICT in teaching, learning, research and management. Another objective of the KENET is to provide a research network for the researches in the leading universities in order to ensure the development of the exchange of information among the researches from different research centers [17].

The analysis of the ICT development in the high school shows that the vast majority of the Kenyan universities recognize the important role of ICT in the educational process including teaching, learning, research and management. But as we could see during our time being in Kenya there was a number of obstacles in the way of the implementation of ICT in the Kenyan high school. The experts who were engaged in the elaboration of the KENET Strategic Plan 2007-2010 have identified the following weaknesses [17]

1. Low investment in the ICT infrastructure in most of the member institutions, most of which still don't have integrated campus network infrastructure.

2. Lack of institutional ICT policy and framework – most institutions don't have any formal policy and organizational structure for ICT.

3. Limited human capacity:
- most senior managers are not aware of the strategic impact of ICT;
- technical capacity in member institutions is limited or non-existent;

4. Limited ICT funding:
- most institutions have small ICT budgets;
- there is limited funding for KENET investments and operations.

5. Lack of a sustainable business model, both in member institutions and in the KENET itself which highly depends on donations from the Communication Commission of Kenya, member institutions and development partners.

6. Weak and inadequate linkage with strategic industry partners.

Unfortunately the vast majority of Kenyan universities especially a national ones still have serious problems with the building of the internal ICT infrastructure. But it is clear enough that only in case of the comprehensive implementation of ICT in the educational process from one side it will become possible to ensure the further development of the national researches in the field of the ICT and, from another side, to bring up a knew generation of the well educated Kenyans who know the benefits of the every day usage of the ICT. Thereby the modernization of high school is the principal circumstance of the construction of the modern information society in Kenya.

3. CONCLUSION

As it have been illustrated in the paper, despite the comparative development of the ICT sector in African states, as it was shown on the example of Kenya, there are still a number of obstacles which in total impede the formation of the information society in the region. The most significant of them are as follows.

To our opinion the real formation of the modern postindustrial information society in Africa will become possible only if the mentality of the ordinary African people would change according to the demands of the postindustrial network society. In other words, people in Africa should reconsider their attitude to the modern information technologies and to learn how to use them in their everyday life. They need to realize the advantages of the modern information technologies and to be ready for training during the whole life in order to get adopted to new information and network technologies. For as long as it doesn't happen the information technologies in Africa will remain mainly an elite one.

Nowadays the vast majority of African people, especially those who live in rural areas, don't consider the Internet as the effective mean of intercultural communication. To our opinion it is possible to overcome this situation only if the State will elaborate the well developed national policy and strategy of the implementation of the modern information technologies in African society which would be aimed at the popularization of the informational and communicational technologies and networks in Africa.

When elaborating its national information policy the State should aim at the broad implementation of the modern information technologies to all spheres of the society including business, government, mass media and private life of ordinary African people. It is necessary to underline that the State should create favorable environment for its people to use information technologies, especially by creating the branched network of public Internet centers not only in big cities but also in rural areas. According to the data produced by the International Telecommunication Union at present, public internet centers are set up only in 1520 African villages out of 400 000 which make up less then 1 % of the total amount of African villages [18].

Of course this is impressing fact but still more important is the fact that in rural areas people are mostly illiterate.

That's why the precondition for African States on their way to the global information society is the rising of the educational level of ordinary African people. It is necessary to say that this problem is a subject of the discussions in different intergovernmental forums including the "G8" summits.

But despite the decisions elaborated in such summits according to the data produced by the World Bank, at present more than 40% of the Africans remain illiterate [19]. And it is obvious that without solving the problem of traditional illiteracy it is almost impossible to solve a computer one.

That's why it is important also to include fundamentals of computer literacy in the programs of high, secondary and even elementary schools. It is necessary to do this in order to grow up in Africa a new modern generation of people of the new postindustrial informational age.

An other main point is that in implanting their national policy in the development of information technologies the States of Sub Saharan Africa should pay more attention to the problem of the popularization of African languages in the Internet.

At present, the vast majority of the information allocated in the Internet is presented in European languages, especially in English. And the share of English

language in the Internet, according to UNESCO's data, makes up more than 70% whereas the share of African languages is less than 1 % [20].

Of course taking into account the fact that there are more than 2000 languages in Africa it is impossible to present all of them in the Global Network. That's why it would be reasonable for African states to pay attention to the most popular languages of the region, e.g. Swahili or Hausa and to translate the Internet sites aimed at the local audience in to those languages. These measures will permit to reduce the cultural dependence of African States from its more developed Western partners and to construct a self-reliant information society based on the cultural and national identity of African States.

Another precondition of the construction of the information society in Africa will be the implementation of the basic principals of the concept of the "E-Government" in the region. That means that in African States their should appear the special governmental computer systems aimed at the establishment of the effective communications between national governments of African States on the one side and the ordinary African people, private sector and public organizations on the another.

It is evident that the realization of the concept of the "E-Government" makes the government more democratic and transparent for its people and, besides, it increases production efficiency of the State.

The present level of the development of information technologies in African States doesn't permit the comprehensive implementation of basic principals of the "E-government". Particularly almost the complete absence of the Internet in rural areas puts serious obstacles in the implementation of an effective E-dialog between the government and the population with the use of the modern information technologies.

Finally, the precondition for African States on their way to the global information society is the elaboration of effective informational laws which would respond the demands of the postindustrial informational age. It means that the States of the region should elaborate the legislative rules which would guarantee the observance of the basic principles of the free receipt and usage of the information.

That's why it is necessary to adjust the problems covering the informational process in general; the activity of Internet-providers in order to exclude the monopolization of the informational market; the Internet itself and the information spreading with the aid of the Global Network.

Only the comprehensive implementation of all the abovementioned frameworks can finally lead to the construction of the modern information society in the States of Sub Saharan Africa which wouldn't be just a copy of a Western model of information society but it would be a self-reliant African model based on the national and cultural identity of African States and nations. We should add that each African State should elaborate its own self-reliant way of the development of information technologies. Of course for the vast majority of African States except South Africa and more or less well developed Northern African States it is rather difficult task.

But the States of Sub Saharan Africa can try to join their forces and to create the integrated Pan African informational and communicational space. In our opinion it is the only way of solving one of the most important African problems – the overcoming of the "digital gap".

As we can see, despite of all the difficulties African States try to promote the Pan African integration process. Thus in 1996 the UN Economic Commission for Africa by the initiative of the African States have elaborated the Africa Information Society Initiative (AISI). The general idea of the AISI is to help the African States which approve the AISI to elaborate the national strategy of the development of the information and telecommunication infrastructure basing on its national priorities.

According to its designers the AISI is not just a technology but an effective mean of the raising the living standard and poverty reduction in African States. That reaffirms the point that the development of the information technologies in Africa and the possessing integration of African States to the global information society is one of the key factors of the social progress and economic growth in the region.

But one can reach this goal only with the aid of the well developed national information policy. The African States recognize that, that's why they underline the necessity of the development of national strategies and action plans of the implementation of information technologies. Only than it becomes possible to stir up the regional and sub regional information and telecommunication integration in order to create an integrated Pan African information and communication infrastructure which may lead to the foundation of the self-reliant African informational community.

4. REFERENCES

[1] The New Partnership for Africa's Development (NEPAD). URL: http://www.nepad.org.

[2] Ministry of State for Planning and National Development and Vision 2030: Kenya Vision 2030. Nairobi, January 2007. URL: http://www.planning.go.ke.

[3] Communication Commission of Kenya: National Information and Communication Policy. Nairobi, January 2006. URL: http://www.cck.go.ke.

[4] Science and technology for development: A Report of the National Council for Science and Technology. NCST № 4. Nairobi, May 1980.

[5] Ministry of Information and Communications: Strategic Plan 2008-2012.
URL: http://www.information.go.ke.

[6] Communication Commission of Kenya: Strategic Plan 2008-2013. URL: http://www.cck.go.ke.

[7] Communication Commission of Kenya: The Kenya Communications Act, 1998.
URL:http://www.cck.go.ke.

[8] Communication Commission of Kenya: The Kenya Communications (Amendment) Act, 1998.
URL: http://www.cck.go.ke .

[9] Information Telecommunication Union: Measuring the Information Society. The ICT Development Index. Geneva, 2009.

[10] Communication Commission of Kenya: Sector Statistics Report Second Quarter 2009/10. URL: http://www.cck.go.ke.

[11] Communication Commission of Kenya: Communications Statistics Report Second Quarter 2008/09 URL:http://www.cck.go.ke.

[12] Kenya Data Networks. URL:http://www.kdn.co.ke

[13] E-government Website. Kenya. URL: http://www.e-government.go.ke.

[14] Kashorda M. Electronic/Mobile Government in Africa: Progress Made and Challenges Ahead. Ethiopia, Addis-Ababa,2009. URL:http://www.unpan.org/emgkr_africa.

[15] Wafula J. M., Wanjohi N. ICT Policy and ICT Initiatives: What Linkages? // The International Development Research Center, Canada. URL:http://www.idrc.ca/en/ev-93059-201-1-DO_TOPIC.html.

[16] The Kenya Education Network Trust. URL: http://www.kenet.or.ke.

[17] The Kenya Education Network Trust: Strategic Plan 2007-2010. URL: http://www.kenet.or.ke.

[18] International Telecommunication Union: Telecommunications/ICT Markets and Trends in Africa. 2007. URL:http://www.itu.int/ITU-D/ict/statistics.

[19] World Bank: Africa Development Indicators. URL:http://web.worldbank.org.

[20] UNESCO. URL: http://www.unesco.org.