

Information and Communication Technologies in the Republic of Malawi: an Assessment of Progress and Challenges Ahead

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ABSTRACT

Information and Communication Technologies (ICTs) have a major impact on western societies concerning economy, politics and culture. These technologies are a main driving force for societal progress and prosperity within such societies. But this development is still very limited and many regions of the world are cut off from the global information flow and have not yet arrived in the so-called information age. The paper at hand gives, based on the five dimensions of society (ecological, political, cultural, economical and technological), an assessment of progress and challenges the Republic of Malawi is facing concerning the implementation of ICTs. For this purpose, a case study in the Republic of Malawi was carried out, using expert interview surveys with Malawian decision-makers and questionnaires for the general public.

Introduction

“By the year 2020 Malawi, as a God fearing nation, will be secure, democratically mature, environmentally sustainable, self reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values and a technologically driven middle income economy.” (*Malawi Vision 2020: National Vision Statement*; taken from the *National ICT for Development (ICT4D) Policy*, October, 2007; Draft Paper)

In the last ten years an increasing body of literature dealing with the relationship between Information and Communication Technologies (ICTs) and development has been emerging (cf. e.g. Mansell/Wehn, 1998; Braga et al., 2000; Okpaku, 2003, Wilson, 2004). Especially for developing countries the challenges implicated with the so called information revolution are enormous and until today the question how developing countries should react to this remains open.

In this paper, based on the findings from a study taken out in November 2007, an overview of progress and challenges concerning ICTs in the Republic of Malawi will be given. The research is guided by the question if and how ICTs are used in Malawi to foster societal development. Furthermore, the main barriers for the

country to enter the information age will be highlighted. Therefore, based on my understanding of sustainable development, which is grounded on ecological, political, cultural, economical and technological sustainability, current development projects, which are supported by ICTs will be analysed.

ICTs for Development

If one reviews the current literature on ICTs for Development it is getting clear that two central viewpoints are in the focus of the discussion: on the one hand the opportunities are highlighted, whereas on the other hand the risks are dominant. Braga et al. for example state for developing countries that “[...] the challenges are substantial. The possibility that the gap already existing between the front-runners of the networking revolution (mostly high-income economies) and those lagging behind (mostly low-income countries) may still grow larger, raises the spectre of a ‘digital divide’. The concern here is not restricted to the issue of connectivity per se; it also includes the implications of connectivity (or lack of it) for economic growth and the broader agenda of sustainable development. The danger faced by all is that digital divide may reinforce patterns of divergence both internationally and within countries” (Braga et al., 2000: 1). The authors also stress the “digital opportunities”, which go side by side with the challenges for developing countries, when they point out that developing countries “[...] can scientifically benefit from investments in modern information infrastructure in a pro-competitive regulatory environment, and leapfrog stages of development in terms of networking roll-out” (Braga et al., 2000: 1-2). This neoliberal understanding is purely focused on economic benefit resulting out of competition.

The idea behind it is that economic development based on free, deregulated markets will automatically lead to societal progress and wealth for all. The developing countries should adopt the Western economic system, monitored by institutions such as the World Bank, which includes large privatisation activities. Of course this modernization theoretical approach is criticised by a number of scholars. For example Ngwenyama et al. conclude that “[...] decades of the IMF and World Bank’s austere policies and the more recent privatization programs on the health, education and civil infrastructure have had a devastating impact on many developing countries” (Ngwenyama et al., 2006: 7).

By the adoption of the Western capitalist’s system a lot of pressure is put on developing countries to join international institutions and agreements. A crucial issue in this context for example is the question of intellectual property rights. The World Intellectual Property Organization (WIPO) is a UN agency with a mandate to harmonise intellectual property rights across the member states. Recently WIPO has developed a plan to harmonise patents, which has tremendous consequences for developing countries. Carlos Correa in his critiques summarises: “[...] harmonized standards would leave little room for developing countries to adapt their patent laws to local conditions and needs; harmonization would take place at the highest level of protection (based on standards currently applied by developed countries, especially the United States and Western European

countries) meaning that the process will exert an upward force on national laws and policies in developing countries resulting in stronger and more expansive rights of the patent holders with the corresponding narrowing of limitations and exceptions. Such higher standards are unlikely to have a positive effect on local innovation in developing countries; and also the danger that the current draft contains standards that are primarily aimed at benefiting the ‘international industries’ and not individual inventors or small and medium size enterprises. (Correa, 2004: 9) It is becoming clear that economic development is in the focus of the debate. Following the understanding of sustainable development argued in this paper, such a reductionistic approach includes several shortcomings and therefore the following working definition of sustainable development is proposed:

Sustainable societal development satisfies the needs of current and future generations; a sustainable society is a society that is based on ecological sustainability (e.g. ecological conservation, stability in the area of health), political sustainability (e.g. political participation, peace), cultural sustainability (e.g. stability in the area of education, self-determined life-styles), economic sustainability (e.g. material wealth) and technological sustainability (e.g. usability and wise use) (cf. Fuchs/Blachfellner/Bichler 2007: 304). The question, which emerges is, how ICTs can be used to enhance the sustainability of all five subsystems to ensure societal well-being.

Already in 1998 Robin Mansell and Uta Wehn have introduced an alternative approach in their book *Knowledge Societies. Information Technology for Sustainable Development*. The focus here lays on ICT applications that could assist developing countries to reap the “[...] social and economic benefits associated with extremely rapid innovation in advanced ICT-based goods and services“ (Mansell/Wehn 1998: 82). The authors discuss a number of ICT applications, which they consider to be appropriate to enhance a broader understanding of sustainability. This list of applications includes e-government, e-learning, e-travelling, e-transport, e-health, e-education and e-inclusion. Christian Fuchs is right when he argues: “These are technologies that today are mainly developed in Western countries and benefit the latter.” (Fuchs, 2006: 49) But still, the attempt to broaden the discussion and the formulation of concrete areas of applications points into the right direction. Following the proposed working definition, I contend in this paper that a sustainable society is based on ecological, political, cultural, economical and technological sustainability. Thus ICTs should be used in a way that fosters the sustainable development in each dimension. In Figure 1 promising strategies for the sustainable use of ICTs are assigned to the five dimension of sustainability (cf. Bichler, 2007: 352).

Figure 1: ICTs for Sustainable Development

Dimension	Strategy for ICT use
Economic Dimension	<ul style="list-style-type: none"> - Wealth for all through new job opportunities - Open Source products instead of Intellectual Property Right patents - Open access to Internet services and applications instead of restrictions (e.g. unpayability, blocking of websites)
Political Dimension	e-government services in form of involvement of citizens through participation instead of purely providing information
Cultural Dimension	<ul style="list-style-type: none"> - ICT awareness through education: well directed ICT training programs instead of self-undirected learning by doing - e-learning applications as a chance to bring education to rural areas
Ecological Dimension	Using cognitive and communicative features of ICTs to rise the awareness of ecological conservation and health related issues
Technological Dimension	Improved usability: the design of applications, which are easy to use and appropriate to the region

Methodology

The study combines quantitative and qualitative methods. The primary data were drawn from a survey of users in eight Internet cafés in the two major Malawian cities Lilongwe and Blantyre in November 2007. Lilongwe is the administrative capital whereas Blantyre functions as the unofficial economic capital. Internet cafés were chosen because the Internet penetration in Malawi is only 0.4% of the total population⁵ and therefore Internet cafés seemed to be the ideal place to find out about the Internet habits of those who actually use the Internet. The Internet cafés e-Center, Licom - Lilongwe Communications, Under the Tree, MGI Cyber Café, Mohiwa Investement Telekom Café, Icon Cyber Center, Informatix and Malawi Net, as well as the respondents, were chosen randomly distributed over the two cities. Usually the Internet cafés were not very well equipped, providing neither headsets nor web cams. After an introduction of my research project, the Internet café managers agreed on my intention to distribute the questionnaires to the clients. I personally handed out the questionnaires and in total 270 completed ones were given back to me.

⁵ Source: internetworldstats.com, 2008

Similar to a study taken out by Peter G. Mwesige⁶ in Ugandan Internet cafés the questionnaire contained both, open- and closed questions that were tested in a small pre-test study at the ICT&S Center of the University of Salzburg. Besides using the questionnaires to find out about quantitative aspect, they were also used in a qualitative way, focusing on different forms of Internet use. The quantitative analysis was carried out with SPSS.

In addition expert-interviews with Malawian decision-makers from governmental institutions, universities, business companies and NGOs were carried out to gain a broader picture.

To round the research off, four Internet café managers were interviewed to discuss their views of the Internet in Malawi. These interviews were very fruitful to gain a deeper understanding about the Internet situation in Malawi, especially concerning the usage.

The researcher also acted as a client in the selected Internet cafés. This enabled different observations concerning the cafés' equipment and the nature of the clients. The combinations of all these research techniques facilitated the researcher to gain a comprehensive understanding of the ICT situation in Malawi, especially regarding the Internet.

Republic of Malawi: Socio-Political Context

Following the *CIA World Factbook* (2007) in July 2007 the Republic of Malawi had estimated 13.603.181 inhabitants. The median age was 16.7 years and the population growth rate for 2007 was expected to be 2.38%. Landlocked Malawi is one of the poorest countries in Southern Africa and belongs to the so-called Least Developed Countries (LDCs). *The Economic and Social Council of the United Nations* uses three criteria, which a country must satisfy, for the identification of LDCs:

- “a low-income criterion, based on a three-year average estimate of the gross national income (GNI) per capita (under \$750 for inclusion, above \$900 for graduation);
- a human resource weakness criterion, involving a composite Human Assets Index (HAI) based on indicators of: (a) nutrition; (b) health; (c) education; and (d) adult literacy; and
- an economic vulnerability criterion, involving a composite Economic Vulnerability Index (EVI) based on indicators of: (a) the instability of agricultural production; (b) the instability of exports of goods and services; (c) the economic importance of non-traditional activities (share of manufacturing and modern services in GDP); (d) merchandise export concentration; and (e) the handicap of economic smallness (as

⁶ Mwesige, Peter G. (2004): *Cyber elites: a survey of Internet Café users in Uganda*. In: *Telematics and Informatics*, 21, 83-101.

measured through the population in logarithm); and the percentage of population displaced by natural disasters.” (UNO, 2002-2005: online)

Until the independency in 1964 Malawi was the British protectorate of Nyasaland. 30 years of one-party rule under President Hastings Kamuzu Banda followed, which led to international isolation. The first free elections that brought Elson Bakili Muluzi into power were held in 1994. Current President Bingu wa Mutharika was elected in 2004 and started an anticorruption campaign as well as a financial discipline program in 2005. In 2006, Malawi was assimilated under the Heavily Indebted Poor Countries (HIPC) program. Currently the Malawian government faces many challenges, above all the rapidly growing problem of HIV/AIDS. Other crucial issues include developing a market economy, improving educational facilities, as well as facing up to environmental problems (deforestation, land degradation, water pollution from agricultural runoff, sewage, siltation of spawning grounds endangers fish populations) (cf. CIA World Factbook, 2007: online).

For 2004 it was estimated that 53% of the population lived below the poverty line. Like in other developing countries, access to educational institutions is very limited. In Malawi the literacy rate, which can be understood as a precondition for ICT use, is at 62.7% along with a for developing countries obligatory gender divide. Whereas 76.1% of the male population can read and write, 50.2% of the female population is illiterate (cf. CIA World Factbook, 2007: online).

Malawi's Telecommunications Landscape: History and Present

In 1993 the first Internet connection for an e-mail service was established in Malawi. A visibility study was taken out by the UNDP⁷ in 1995 to assess the potential of ISPs⁸ in the country. The results indicated that the market existed, however an ISP was not established due to licensing issues. Back then Malawi did not have a telecommunication regulator, which was concerned with ISP licensing issues and instead of licensing the UNDP supported *Malawi Sustainable Development Network Programme (SDNP)*, the private company *Malawi Net* was licensed in 1997 (Nyirenda, 2007; Personal Interview). Under the *Malawi Communications Act* from 1998 the *Malawi Communications Regulatory Authority (MACRA)* was established “with responsibilities for licensing telecommunications, postal and broadcasting operators, settling disputes among operators, approving tariffs, promoting and monitoring free and fair competition, allocating and managing the radio frequency spectrum, managing the numbering plan, type approving terminal equipment and protecting the consumers” (www.macra.org.mw). Following this telecommunications act in 1998 a second ISP (SDNP) was introduced. The infrastructure was built up with the help of the UNDP and the service was funded for two years. Since 2000 SDNP is self-sustaining and is furthermore self-responsible for the development of their infrastructure.

⁷ United Nations Development Programme

⁸ Internet Service Provider

Today there are 10 active commercial Internet Service Providers in Malawi out of the licensed 22 ISPs, offering a wide range of Internet services. The total number of users in 2006 was 55,029; by given 13 millions inhabitants the Internet penetration is only at 0.4 in Malawi (cf. MACRA, 2007). For 2007 the *CIA World Factbook* numbers 347 Internet hosts in use. According to Paulos B Nyirenda, head of SDNP and Professor at the University of Malawi, the growth rate, after a high increase at the beginning of the millennium, has been flattening since 2006 due to the high costs of Internet connection and computers. In 2007 Malawi had 175,209 main telephone lines subscribers (fixed line penetration: 1.35) and with a number of 944,503 nearly six times more mobile cellular phones (cf. MACRA, 2007).

ICTs and Development: Technological Dimension

The connectivity issue is an enormous barrier for the diffusion of ICTs in Malawi. The results of my survey suggests that for 57% of the respondents the slow connection, for 15% the availability of computers and for another 12% the non-existence of an Internet connection were the major problems. Since the country is not connected with a fibre cable, all Internet access is based on satellite Internet services. This makes the Internet connection on the one hand very expensive and on the other hand extremely slow.

Under these circumstances much is expected from the NEPAD⁹ initiative. Malawi is a signatory to the NEPAD Protocol on the *ICT Broadband Infrastructure Network*, which is dedicated to developing both submarine and terrestrial broadband networks across African countries to ensure that there are cheap and high-quality communication services. Under this initiative it is planned to connect Malawi to Mozambique and Zimbabwe via fibre cables. The one to Mozambique is scheduled to function already in 2009. This would mean a tremendous step for Malawi because Mozambique is again connected to South Africa and from South Africa there is one fibre cable to Europe and another one to India. Another intention is to build a fibre cable infrastructure, which connects Malawi to Dar es Salaam and Lusaka. In addition the *Malawi Telecommunications Limited (MTL)* is running a separate fibre cable program. Together with the Mozambican telecommunication provider *Telecomunicações de Moçambique (TDM)*, MTL is planning to connect the two countries by June 2008. MTL furthermore aims to expand the infrastructure inside the country by setting up a fibre backbone interlinking Blantyre, Lilongwe, Zomba and Mzuzu (Machika, 2007; Personal Interview).

All these efforts are associated with the hope that the data-signalling rate will increase and the costs will go down. But Paulos B Nyirenda is not so optimistic: "In West Africa the fibre is already there, but the price is still around 3000 Dollars per megabit/s per month. It has to do with the companies that build the fibre and

⁹ New Partnership for Africa's Development

the amount of return they get for their investment. Fibre connections are big business, not controlled by the government” (Nyirenda, 2007; Personal Interview). Like in other African countries, the government does not any longer control the IT infrastructure sector. Companies from outside, mainly from the Western world, are building the infrastructure. In the case of Malawi, Alcatel-Lucent is charged by the Malawian government to establish the connection to Mozambique. (Nyirenda, 2007; Personal Interview). As Yunusa Z. Ya’u (2005) in his article *Globalisation, ICTs, and the New Imperialism: Perspectives on Africa in the Global Electronic Village* so aptly sums it up: “While African countries that have undertaken the liberalisation of the telecommunication sector have ended state monopolies they have suddenly found themselves saddled with a new monopoly: that of the foreign investors. The AITEC report on the state of ICT infrastructure in Africa for the year 2000 (Hamilton 2002) clearly shows this trend.” Western companies mainly drive the implementation of the telecommunication infrastructure. The shareholders of *Malawi Net* for example are *US Comnet* with 64% and *MTL* with 36%. *Celtel*, the main mobile phone provider, belongs to *Zain* (formerly *MTC*), an international corporate group based in Kuwait. *Celtel* has built networks in 15 African countries and covers more than a third of the population of Africa.

Mobile phones have become widespread phenomena in the last five years, almost exclusively in form of prepaid services. Currently there are two providers, *Celtel Malawi Limited* licensed in 1999 and *Telekom Networks Malawi Limited* licensed in 1995. The high mobile density (6.53) compared to the very low fixed line penetration (1.35) could potentially support the leapfrogging thesis, which states that developing countries can overleap certain stages of development by using mobile technologies (cf. Castells et al., 2006: 216). Nyirenda (2007) basically agrees on that, especially since *Celtel* started a GPRS¹⁰ service in October 2007, but mentions at the same that it heavily depends on the price since mobile airtime is three times more expensive than the already very expensive fixed line costs.

ICTs and Development: Economic Dimension

It is getting clear that the technological difficulties strongly affect the economic subsystem. Due to the missing infrastructure a dial-up connection with 33 kbit/s for example costs about 30 US Dollar per month, whereas a faster WiMAX¹¹ connection with 64 kbit/s starts around 200 US Dollar per month. Additionally one has to pay between 70 and 100 US Dollar to the *Malawi Telecommunications Limited (MTL)* for the telephone line; that makes the line costs about three times more expensive than the service costs (Nyirenda, 2007; Personal Interview). Taking into account that for 2006 the GNI per capita¹² was calculated to be 170 US Dollar¹³ it becomes obvious that the majority of the population is financially

¹⁰ GPRS (General Packet Radio Service) is a mobile data transmission technology available to users of GSM (Global System for Mobile Communications)

¹¹ Worldwide Interoperability for Microwave Access

¹² Gross National Income per capita

¹³ Data taken from the World Bank:

excluded from Internet use. Nyirenda states that the monthly price for a satellite connection in Malawi, this applies for Southern Africa in general, is 3000 US Dollar per megabit/s. Under this heavy economic pressure the market cannot afford to offer broadband solutions (Nyirenda, 2007; Personal Interview).

At the moment there are hardly any people profiting economically from ICTs in Malawi. Those who do profit from these technologies are already the elite of the country and the majority of the people are facing the risk that the already existing gap is even going to widen. Eighteen percent of the respondents in my survey had a net income between 300 and 500 US Dollar and astonishing 21% had an income higher than 500 US Dollar. Taking into account that the GNI per capita is about 170 US Dollar it is obvious that Internet use is limited to very pecunious people and the majority is economically excluded. My findings concerning the age distribution show that the very high costs also lead to problematic user demographics: the typical Internet user in Malawi is already quite old. Most of the respondents, forty-nine percent, were between twenty-six and forty years old.

These findings refer back to the very high costs. Nyirenda also agrees on that by stating that older people mainly use the Internet for business purposes, because using the Internet for fun is far too expensive for youngsters (Nyirenda, 2007; Personal Interview). Bearing in mind that the median age was just 16.7 years and 46% of the overall population is aged under fourteen years (cf. CIA World Factbook, 2007: online), it seems essential to enhance the number of young people using the Internet. In that case the problem is not an educational one since only seven percent noted the lack of skills as a main problem concerning Internet use. This low number may arise from the quite high diffusion of IT relevant subjects in private schools and universities, where 54% of the survey participants learned their computer skills and 37% their Internet skills. The biggest barrier is the cost factor, which 59% of the interviewees asserted as the central difficulty. 57% of the participants in the survey mentioned that they used Internet for business purposes, mainly to communicate via E-Mail. Another result of the high expenses is that only 34% of the respondents had Internet access at their workplace and therefore it is quite common to leave the office to use the Internet in Internet cafés.

As aforementioned the mobile penetration is already quite high in Malawi and it seem that the Malawian government has already realised the potentials offered by mobile phones. At the moment the *Ministry of Agriculture* is running a project named *Farmers and Corps*, which aims to support Malawian farmers in their sales activities. Like in other African countries, the farmers make use of the quite well established mobile phone infrastructure by accessing economic information via mobile phones. The market prices for certain commodities, such as tomatoes or maize, can be found out on a daily basis by using SMS¹⁴. Experiences from other

<http://devdata.worldbank.org/external/CPProfile.asp?CCODE=MWI&PTYPE=CP>

¹⁴ Short Message Service

countries, such as Ghana or Kenya, demonstrate that this application can make a substantial contribution to the economic development and therefore this is a promising project.

ICTs and Development: Ecological Dimension

At the moment there are no specific e-health or ecological awareness raising applications available in Malawi. The conducted study however shows that the Malawian Internet users already apply the Internet for searching health related issues by using e.g. *Google* to find out how to treat certain diseases. Nineteen percent of the respondents stated that they use the Internet to seek health information for themselves or others. Especially Malawi, where a lack of doctors is ubiquitous, could benefit from e-health applications by introducing information focused applications as well as interactive communication tools. Given that the awareness of the possibilities already exists on the user side, focusing on e-health services is a crucial issue. The prime hindrance again is the connectivity problem, because interactive telemedicine applications require a high bandwidth. Currently, the Malawian telecommunications infrastructure is not really capable to accomplish such services.

ICTs and Development: Cultural Dimension

At present the Malawian government is carrying out a project called *Universal Access Policy for rural Telecommunications Development*, which aims at connecting underserved communities in remote areas. For this purpose three central strategies are applied: The first one focuses on the establishment of Telecenters, which offer telephony, Internet access and photocopy services. The government does not maintain the Telecenters, instead local entrepreneurs should run them. The idea behind is that “[...] it should be like a business for them” (Machika, 2007; Personal Interview) and thereby it should be self-sustaining when the government pulls out.

The second strategy deals with capacity building. Most of the Internet content is produced outside Malawi, mainly in the Western world, and therefore it is quite often not relevant for those people living in rural areas. This is also shown by the findings from my research, which demonstrates that *Google*, *Yahoo* and *Hotmail* are predominant. There is hardly any content in the main language Chichewa, thus this strategy targets at the production of local content, which is appropriate for the people and the region.

The third strategy tries to intervene on the hardware aspect. Devices such as computers or mobile phones are still very expensive and therefore the government is beholden to help reducing the costs. The distribution should take place from community to individual ownership and is funded by the *Universal Access Grant* (Machika, 2007; Personal Interview).

Besides health related applications my findings suggests that e-learning services would be well received by the Malawian Internet users. The category *Research*

for School and/or University counted for 48% and the category *Training and Educational Purposes* for 30% of the respondents as a main purpose for Internet use. At the moment there are no specific e-learning or distance learning applications and thus the Malawians use mainly search engines (e.g. *Google*) to get learning materials. The great interest in education and health related issues might serve as a good departure point for the implementation of ICTs for sustainable development.

ICTs and Development: Political Dimension

The findings of my survey illustrate that e-government is still in the early stages. Only thirteen percent of the interviewees conducted administrative procedures online, twelve percent caught up on political activities via the Internet and fewer than two percent use the Internet to co-ordinate political activities. This has again to do with the bad connectivity, because most of these services are highly interactive and hence require a stable and fast data-signalling rate.

Presently there are two projects in the range of politics: the *National ICT for Development (ICT4D) Policy*, which is aimed at catalysing the socio-economic development using ICTs and the *Government-wide Area Network Project*, which endeavours to link countrywide all governmental offices within one network. The *Department of Information Systems and Technology Management Services* is carrying out this internal project to enhance the information flow between all governmental institutions with the goal to foster effectiveness and to reduce costs. The ICT4D Policy focuses on (cf. National ICT for Development Policy: Draft Paper):

- 1) **Strategic ICT Leadership**
- 2) **Human Capital** with the sub-themes *Education, Health and Accelerated Human Resource Development*
- 3) **Governance** with the sub-themes *Promoting Electronic Government and Electronic Governance, Promoting ICT Security and Promoting National Security, Law and Order*
- 4) **ICT Industries** with the sub-themes *Facilitating the Development of the Private Sector and Developing an Export-Oriented ICT Industry*
- 5) **Promotion of ICT Infrastructure**
- 6) **Growth Sectors** with the sub-themes *Modernization of the Agriculture, Promoting E-Tourism and Modernization of the Natural Resources,*
- 7) **Community**
- 8) **The Legal and Regulatory Framework**
- 9) **Regional and International Cooperation**

The Malawian government has chosen a multi-stakeholders approach to implement the ICT4D Policy, including governmental institutions, the private sector and non-governmental institutions. Although the policy points into the right direction, covering all areas proposed in this paper, the outlined strategies remain very vague and the presentation of concrete projects is missing. Furthermore the financing of the proposed strategies remains open.

Conclusion

The analysis shows that currently there are different ICT related projects in all five proposed dimensions (ecological, political, cultural, economical and technological) of sustainable development. The success of all these projects heavily depends on the technical infrastructure and in the case of Malawi technical difficulties are the main barrier for the diffusion of ICTs, especially the Internet. The fact that the country is not yet connected with a fibre cable leads to very high costs combined with an extremely low bandwidth and this again results in the exclusion of the majority of the Malawian citizens.

Generally the low number of users (55.029 in the year 2006) and the limited availability of services resulting from the poor infrastructure remain immense challenges for the political decision-makers. The expansion of the infrastructure is a central concern of the *National ICT for Development Policy*, but the question how to realise this remains unanswered. The same applies for the rest of the mentioned strategies.

Anyhow, the already existing projects discussed in this paper are promising and the great interest of the Malawian Internet users in education and health related issues opens up the possibility for the adoption of new Internet based services in form of e-learning and e-health applications. The results of the survey indicate that such services would be well received by the Malawian users and thus would contribute to a sustainable use of ICTs.

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