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Southern Africa and the Digital Divide: A Malawian Case Study

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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. However, this development is still very limited and huge regions of the world are totally cut off from the global information flow and have not yet arrived in the so-called information age. Different kinds of endeavours are undertaken to bridge this digital divide by various institutions, mainly from the first world. These development activities often seem to be undertaken in a "retro-colonial" way, which means that Western technologies and the fields of their applications are put upon developing countries without taking into account the local conditions and needs. This paper is part of a larger research project that compares different developing countries (Yemen, Laos, Malawi and Guatemala) concerning the status quo of the ICT diffusion. 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.

Keywords: Information and Communication Technologies (ICTs), Developing Countries, Digital Divide, Sustainable Development, Republic of Malawi

Introduction

INFORMATION AND COMMUNICATION Technologies (ICTs) are claimed to be a central engine for societal progress and prosperity. So far, only the Western world has benefited from these technologies while especially developing countries are facing the challenge that the already existing tremendous gap between them and the high-income economies in the West may still widen. This paper is the second result of a larger research project, which aims to identify strategies for closing this gap. For this purpose case studies in four countries (Yemen, Guatemala, Malawi and Laos) were carried out, which endeavour to find strategies for the sustainable implementation of ICTs, particularly in Least Developed Countries (LDCs).

Initially a brief overview of potential benefits and risks of ICTs in the context of development are discussed, followed by a short description of the socio-political situation and the telecommunications landscape in Malawi. The aims and scope, as well as the applied methodology will be introduced, followed by selected findings, before I sum it up in a conclusion.

ICTs for Development

In the last ten years an increasing body of literature dealing with the relationship between ICTs and development has been emerging (cf. e.g. Mansell/Wehn, 1998; Braga et al., 2000; Okpaku, 2003, Wilson, 2004). One can identify two central viewpoints: on the one hand the opportunities are highlighted, whereas on the other hand the risks are dominant. Braga et al., for example, state that for developing countries "(…) 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 theoretical approach to modernization 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 privatiz-

ation 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 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. In 1998 Robin Mansell and Uta Wehn 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 in the right direction. Following Christian Fuchs (2006), I contend in this paper that a sustainable society is based on ecological, political, cultural, economical and technological sustainability.

In order to advance a non-reductionistic, integrative, complex understanding of sustainability, the following working definition 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 lifestyles), economic sustainability (e.g. material wealth) and technological sustainability (e.g. usability and wise use) (cf. Fuchs/Blachfellner/Bichler, 2007: 304).

To support societal development in developing countries, ICTs should by 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	- 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	- 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

Republic of Malawi: Socio-political Context

Following the CIA World Factbook (2007), in July 2007 the Republic of Malawi had an estimated population of 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 to be identified as 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 measured through the population in logarithm); and the percentage of population displaced by natural disasters." (UNO, 2002-2005: online)

Until independence in 1964 Malawi was the British protectorate of Nyasaland. Thirty 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).

Aims and Scope

The goal of the study is to examine ICTs in developing countries on the macro, as well as on the micro level. The research on the macro level is guided by the central research question:

Are ICTs in Malawi used to foster societal development or are they reinforcing imperialistic patterns of Western hegemony?

On the micro level the study aims to investigate the Malawian users' demographics, their habits of ICT use, as well as the barriers and opportunities for the Malawian citizens emerging from the upcoming information age.

The findings from the macro and the micro level will be correlated on the basis of the five dimensions of society (ecological, political, cultural, economical and technological) to assess the state of the art of ICTs in Malawi.

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 0.4% of the total population (very poor) 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.

Similar to a study taken out by Peter G. Mwesige 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.

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 proved very fruitful in gaining 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.

Malawi's Telecommunications Landscape

In 1993 the first Internet connection for e-mail service was established in Malawi. A visibility study was taken out by the UNDP[1] in 1995 to assess the potential of ISPs[2] in Malawi. 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.

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; given that there are 13 millions inhabitants, the Internet penetration is only at 0.4 in Malawi (cf. MACRA, 2007). For 2007, the CIA World Factbook stated that 347 Internet hosts were in use. According to Paulos B

[1] United Nations Development Programme
[2] Internet Service Provider

Nyirenda (2007) 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 line subscribers (fixed line penetration: 1.35) and with 944.503 nearly six times more mobile cellular phones (cf. MACRA, 2007).

The connectivity issue is an enormous barrier for the diffusion of ICTs in Malawi. Since the country is not connected with a fibre cable, all Internet access is based on satellite Internet services. This makes the Internet connection very expensive and extremely slow. A dial-up connection with 33 kbit/s for example costs about 30 US Dollar per month, whereas a faster WiMAX[3] connection with 64 kbit/s starts around 200 US Dollar per month. Additionally, one has to pay between 70 and 100 US Dollar to 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 capita[4] was calculated to be 170 US Dollar[5] it becomes obvious that the majority of the population is financially excluded from Internet use. Paulos B 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).

Under these circumstances much is expected from the NEPAD[6] 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 that Malawi, Mozambique and Zimbabwe be connected via fibre cables. The line to Mozambique is scheduled to function as soon as 2009. This would mean a tremendous step for Malawi, because Mozambique is connected to South Africa and from South Africa there is one fibre cable to Europe and another to India. Another intention is to build a fibre cable infrastructure, which connects Malawi to Dar es Salaam and Lusaka. In addition 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. Furthermore, MTL 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, head of SDNP and Professor at the University of Malawi, 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 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 control the IT infrastructure sector any longer. 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) so aptly sums it up in his article "Globalisation, ICTs, and the New Imperialism: Perspectives on Africa in the Global Electronic Village": "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% shareholds. 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 became a huge phenomena in the last five years, almost exclusively in the 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). Paulos B Nyirenda basically agrees on this issue, especially since Celtel started a GPRS[7] service in October 2007, but mentions at the same time that it heavily depends on the

[3] Worldwide Interoperability for Microwave Access
[4] Gross National Income per capita
[5] Data taken from the World Bank: http://devdata.worldbank.org/external/CPProfile.asp?CCODE=MWI&PTYPE=CP
[6] New Partnership for Africa's Development
[7] GPRS (General Packet Radio Service) is a mobile data transmission technology available to users of GSM (Global System for Mobile Communications)

price since mobile airtime is three times more expensive than the already very expensive fixed line costs.

Findings on the Micro Level

Demographics

Eighty-six percent of the participants were male, whereas 32% were female. The results of the survey suggest that 93% of the respondents had used the Internet previously. Although all of the participants were interviewed in Internet cafés, 7% had not used the Internet. The explanation is that Internet cafés quite often also provide copy, print and fax services. 95.6% of the male and 87.4% of the female respondents had used the Internet. The findings concerning the age distribution suggest that 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. Paulos B Nyirenda also agrees by stating that older people mainly use the Internet for business purposes, because using the Internet for fun is far too expensive for youngsters. Unlike in Yemen and Uganda, in Malawi there is hardly any difference in the intensity of Internet use relating to family status. 50% of the participants were single, 45% where married and the remaining 5% divorced.

Seventeen percent of the respondents earned less than 100 US Dollar per month, 31% earned between 100 and 300 US Dollar, 18% had a net income between 300 and 500 US Dollar and 21% had an income more than 500 US Dollar. 13% of the survey participants had no source of income. Taking into account that the GNI per capita is about 170 US Dollar it is clear that Internet use is limited to very pecunious people and the majority is economically excluded.

Thirty-three percent of the respondents had completed secondary school, 19% had graduated from university, 5% had completed a vocational training center, 3.5% had attended a religious school and another 6% had graduated from or were attending some other tertiary institution.

These findings are very similar to the findings made in other studies in developing countries (cf. for example Bichler, 2007; Mwesige, 2004; Robins, 2002). Especially the findings from the study "Cyber elites: a survey of Internet Café users in Uganda" carried out by Peter Mwesige and my own results from a study taken out in the Republic of Yemen are surprisingly similar with the outcome of this project. The typical Internet user is well educated, pecunious and male.

Use of ICTs

My survey suggests that on average 38% of the Malawian Internet users are online on a daily basis. Another 38% use the Internet several times per week, while only 24% use the Internet several times per month or rarely. The Malawian survey participants were furthermore asked for how long they had been using the Internet. Five percent of the respondents had used the Internet for less than one year, 30% between one and three years and 28.5% had been online already three to five years. Under the described economic circumstances it is worth mentioning that 36% of the interviewees had used the Internet for more than 5 years.

The high importance of Internet cafés for Internet access in developing countries is demonstrated in my research, where 88% of the respondents accessed the Internet in Internet cafés, while 34% had access at their workplace, 14% had other avenues of access, such as access at a friend's place or public wireless access, and only 12% accessed the Internet from home. Even though 45% of the participants in the study had a landline phone, another 52% had a computer at home and a further 77% had a computer at their workplace, the main access point to the Internet was the Internet café. A remarkable 97% of the respondents owned a mobile phone[8].

The survey suggests that infrastructure related problems are dominant concerning Internet use. For example, 57% of the respondents observed that a slow connection was their major problem, while for 15% it was the availability of computers and another 12% found the lack of an Internet connection the major problem. As discussed earlier, the cost factor is, together with the bad connection, the biggest barrier. Fifty-nine percent asserted the high costs as the central difficulty. Not only private Internet access at home, but also the Internet café fees, which range between 0.04 and 0.07 Dollars per minute, is very expensive. Therefore the minimum charge for one hour Internet is two to four US Dollars, whereas one hour has to be considered as very short, considering the very slow connection. Seven percent noted the lack of Internet skills as a main problem. 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. Another 25% attended a training program, while 20% were trained by relatives or friends and 43% of the interviewees learned it by doing. The situation concerning how to use the Internet is slightly different; 37% got their Internet skills at school or university, 13% took part in training programs, in 30% of the cases the skills were con-

[8] For a brief discussion on the potentials of mobile phones for leapfrogging in Malawi see chapter "Malawi's Telecommunications Landscape"

veyed by relatives or friends and the majority (57%) were self taught.

The main purpose for Internet use was e-mail service (96%), followed by surfing (e.g. reading news online) with 51% and chat services with 23% (see Table 1).

Table 1: Popular Services and Applications

Services and Applications	Percentage
Services and Applications: E-Mail	96,4%
Services and Applications: Surfing	50,8%
Services and Applications: Chat	23,2%
Services and Applications: Instant Messenger	19,6%
Services and Applications: Mailing List	19,6%
Services and Applications: Gaming	10,4%
Services and Applications: Phone Call via the Internet	8,8%
Services and Applications: Bulletin Boards	6,4%
Services and Applications: Blogs	6,0%
Services and Applications: Wikis	2,8%
Services and Applications: Other	5,6%

Furthermore twenty percent communicated via instant messengers, six percent each were engaged in blogs and bulletin boards, twenty percent used mailing lists and another nine percent made phone calls over the Internet (voice over IP). Although the connection is very instable and, in addition, voice over IP services (e.g. Skype) are illegal due to the telephone monopoly of MTL, they are quite popular. E-mail is by far the most used Internet service, because the text can be written offline in an editor and afterwards be pasted in the E-mail client. Services that require a higher and stable bandwidth, e.g. Web 2.0 applications, are very difficult to use and therefore do not enjoy great popularity (see Table 2).

Table 2: The use of Web 2.0 in Malawi

Application	I know	I use	I contribute	I don't know
wikipedia.org	10%	11%	2%	77%
www.myspace.com	15.5%	8%	2%	74.5%
www.youtube.com	11%	6%	0.8%	83%
www.flickr.com	3%	0.4%	0.4%	96%
www.digg.com	2%	0.8%	0%	97%
www.43things.com	2%	0%	0%	98%
www.last.fm	1%	0.8%	0%	98%

The significance of the communicative features of the Internet also manifests itself in the purposes of use, where the category "remaining in contact with friends or family" is the most important one. "Business purposes" (57%), "research for school and/or university" (48%) as well as using the Internet for "training and educational purposes" are also on top of the list (see Table 3). Resulting from the high importance of the educational possibilities of the Internet for Malawian users, one can presume that e-learning applications would be especially well received. The same applies for health related issues. At the moment, there are no specific e-health applications, and therefore the Malawians use Google to find out how to treat certain diseases.

Table 3: Purpose of Use

Purpose	Percentage
Remaining in Contact with Friends or Family	73,9%
Business	56,7%
Research for School/University	47.8%
Using Internet for Training and Educational Purposes	29,8%
Downloading Music/Movies/Software	26,5%
Using Internet to seek Health Information for myself or others	18,8%
Networking	13,9%
Conducting Administrative Procedures Online	12,7%
Getting Political Information Online	11,8%
File sharing	11,4%
Online Shopping	10,6%
Online Banking	9,8%
Online Dating	6,5%
I maintain my own blog or online profile	5,3%
I maintain my own website	3,7%
Co-ordinating Political Activities Online	1,6%
I produce online content or software myself	1,6%
Gambling	0,4%
Other	4,5%

Conclusion

Economic Dimension

The development of telecommunication infrastructure is strongly driven by Western companies. The fibre cable between Malawi and Mozambique, for example, will be established by Alcatel-Lucent. The mobile sector is dominated by the Kuwaitian corporate group, Zain, and US Comnet is the main shareholder of Malawi Net. Using the Internet for business purposes (56,7%) is very popular, whereas up until now the possible fields of application are limited to business communication and conducting market research online. E-commerce, in the form of online shopping is a marginal phenomenon (10,6%) due to a lack of credit cards and a want of confidence.

Technological Dimension

Only seven percent of the survey participants noted a lack of skills as a main barrier for Internet use. At the moment technical difficulties are the main barrier for the diffusion of ICTs, especially the Internet, in Malawi. 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. Neoliberal market reforms, which included the privatisation of MTL and the opening up of the Malawian telecommunications market for foreign investors, has not really improved the situation so far. The data-signalling rate will definitely increase, but the costs will probably remain high due to the company's aimed amount of return for their investment. The very high costs result in problematic user demographics: the typical Malawian Internet user - aged between twenty-six and forty years - is quite old, (taking into consideration that the life expectancy at birth is 43 years) the average income is high and the education level is also far above average.

Ecological Dimension

At the moment there aren't any 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. Malawi especially, 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.

Political Dimension

The findings of my survey illustrate that e-government in Malawi 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 to do with bad connectivity, because most of these services are highly interactive and hence require a stable and fast data-signalling rate. However, e-government is considered to be a central aspect in the Malawian National ICT for Development (ICT4D) Policy. The policy, which is aimed at catalysing the socio-economic development using ICTs, strongly focuses on "promoting electronic government and electronic governance" (National ICT for Development Policy: Draft Paper). Furthermore, the Malawian government has established the Government-wide Area Network Project, which endeavours to link all governmental offices countrywide 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.

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.

Cultural Dimension

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 demonstrate that Google, Yahoo and Hotmail are predominant. There is hardly any content in the main language Chechewa, thus capacity building in this area is necessary. The Malawian government factors the capacity building aspect in a project called "Universal Access Policy for rural Telecommunications Development", which aims at fostering the production of local content, which is appropriate for the people and the region (Machika, 2007; Personal Interview). My findings furthermore suggest that e-learning services would be well received by the Malawian Internet users. The category, "Research for School and/or University" accounted for 48% of main internet use while the category, "Training and Educational Purposes" accounted for 30% of main internet use according to the respondents. 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 related issues might serve as a good departure point for the implementation of ICTs for sustainable development.

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