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ICTs and development in Zambia: challenges and opportunities

Information and communication technologies (ICTs) are increasingly important in achieving development goals and promoting citizen participation. Zambia is one of a number of countries in the Southern African region that have sought to include ICTs in their national development plans. This policy brief summarises a review of the successes and failures of this approach in Zambia, and considers the next steps that are needed to meet the information and communication needs of the coming generation.

ICTs have received growing attention in recent years from development practitioners, policymakers, government officials and civil society organisations in Southern Africa. They are believed to contribute to improving development outcomes in two main ways:

- ICT-based knowledge and products contribute directly to wealth creation

- the use of ICTs contributes indirectly to national development through its impact in social and economic sectors such as agriculture, health and education, and by empowering individuals to take advantage of new opportunities.

Individuals also benefit from the availability and use of ICTs in a number of ways – for example, by substituting phone calls for travel, which saves time and money, and by using ICTs to obtain information on prices, for their own produce and for purchases.

Technician setting up satellite receiver for Macha Works.
MACHA WORKS

In these various ways, ICTs can have a significant impact on a country's ability to achieve the Millennium Development Goals (MDGs).

There are, however, also constraints on the potential impact of ICTs in many developing countries. These constraints include inadequate technical infrastructure, limited human skills to use available networks and services, the relatively high cost of communications equipment, and poor policy and regulatory environments. These factors reduce the scope for countries and communities to realise the potential of ICTs for development (ICT4D), and may even increase exclusion and marginalisation. The difference between access to and use of ICTs in urban and rural areas, and between prosperous and poor members of society – often called the 'digital divide' – has been of particular concern.

Promoting dialogue, debate and change

The Zambian context

The Republic of Zambia is a landlocked country in Southern Africa, which has been independent since 1964. Its population has grown from 10.8 million in 2000 to 12.6 million in 2008. Zambia ranks 164th out of 182 countries in the Human Development Index as listed in the UN Human Development Report 2009. This puts it in the category of countries with low human development. The country's economy is towards the lower end of the sub-Saharan African spectrum, with a GNP per capita of US$1,300, although growth rates averaged more than 5 per cent in the years leading up to the 2007–2008 international financial crisis. The economy is highly dependent on agriculture and on the extraction of copper from an area of the country known as the Copperbelt.

As a 'least-developed' country, Zambia suffers from high levels of deprivation and poor infrastructure, especially in rural areas. Literacy, however, now runs at between 85 per cent and 90 per cent of the adult population.

The country's current National Development Plan covers the years 2008–2012. Priorities for national development include education, agriculture (food security), wealth creation and the reduction of HIV and AIDS and malaria.

ICTs in Zambia

Like other countries in sub-Saharan Africa, Zambia has experienced a tremendous upsurge in telephone ownership and use since the advent of mobile phones. The number of mobile phone subscriptions rose from less than 500,000 in 2003 to more than 3 million in 2008, around one cellphone for every two adult citizens. At least one of Zambia's mobile networks now has coverage throughout the national territory.

The fixed telephone network, however, remains extremely limited in range and use – largely confined to the main urban centres, the Copperbelt and the rail links between them. In 2008 there were just over 90,000 fixed line subscriptions. While the mobile and internet sectors are competitive – there are three national mobile operators and some 20 internet service providers (ISPs) – the fixed network has remained a monopoly of the state-owned company ZAMTEL. ZAMTEL also has monopoly rights over the country's international gateway which allows phone connectivity to other countries.

The Zambian economy is heavily reliant on copper mining.
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The limited fixed phone network has proved to be a major constraint on internet access in Zambia. In 2007, the Communications Authority of Zambia (CAZ) estimated that there were 18,000 internet subscribers in the country, mostly using dial-up access. Even in 2009 some government departments were still using dial-up rather than broadband internet connections.

However, thanks to rapid growth in the number of telecentres and cybercafés, the number of internet users is estimated to have risen from around 50,000 to 500,000 between 2006 and 2007. These telecentres are managed either by private entrepreneurs or by NGOs, some with donor support. There is no official initiative to promote them, but potential telecentre operators may borrow from state empowerment funds to cover set-up costs. Telecentres have become the most important means of access for internet users in Zambia, although – as elsewhere in Africa – it has been difficult to establish successful business models or to ensure skilled maintenance of technical equipment.

Research methodology

The study used three working methods: desk research into statistics, reports and policy development resources; interviews with some 40 stakeholders in a variety of social and economic sectors, including the ICT sector itself; and online consultation on issues such as the progress of the 2009 ICT Act.

In 2009 new fibre optic cables were laid along the coast of East and Southern Africa. These may lead to lower prices for international bandwidth. However, Zambia will only benefit fully from this if it is accompanied by improved national and regional fibre optic cable backbones, revised international interconnection agreements, and greater liberalisation of the telecoms marketplace within the country.

National broadband fibre optic networks are under construction in Zambia. One is being developed by the fixed telecoms operator ZAMTEL, while separate networks are being built by the country's power utility ZESCO and the Copperbelt Energy Company (CEC). These are separate ventures, however, and neither the government nor the telecoms regulator has required coordination between them.

Until recently Zambia's telecommunications market was regulated by CAZ, and overseen by the same ministry as the state-owned operator ZAMTEL. Although CAZ is generally felt to have performed competently, some Zambians believe that its subordinate status led to a regulatory environment that favoured ZAMTEL over other operators. At the end of 2009 CAZ changed its name to the Zambia Information and Communication Technology Authority (ZICTA) when it assumed a new, broader mandate and gained greater autonomy following the passage of a new ICT Act. Measures towards liberalising the fixed market and international gateways, and for the partial privatisation of ZAMTEL were also underway by the end of 2009.

By 2009, some mobile phone users with higher specification phones were beginning to make use of mobile internet access, which may provide a major new means of online access in the future.

Another major constraint on ICT development in Zambia, as elsewhere in Southern Africa, has been the lack of adequate international communications infrastructure. The problem is particularly acute for Zambia because it is a landlocked country, which has had to rely on satellite links or interconnection agreements with neighbouring countries to gain access to international telecommunications networks. This means that internet use in particular has been expensive in comparison with other parts of the world.

Introducing web-based learning

AfriConnect, in partnership with the Ministry of Education, have been piloting a project aimed at bringing web-based eLearning to schools in different parts of the country. Some 20 schools have been provided with free or low-cost connectivity, plus teacher training and support. A large website of free learning materials has been built, based on the Zambian curriculum. The project is now moving to the next phase with more schools and a more detailed study of how teaching and learning can be improved and what inputs are needed. The objective is to move from the traditional chalk-and-talk pedagogy to enquiry-based learning, while at the same time bringing the option of lifelong learning to people who have already left school. With collaboration from Intel, Cambridge University and the University of Zambia, this project will revolutionise the way students learn in Zambia.

Using the internet to access resources and support will enhance teaching and learning in Zambian schools.
CRISPIN HUGHES | PANOS PICTURES

Policy on ICTs and ICT4D

Zambia's government began to develop a national ICT Policy in 2001, through an extensive consultation process including academics and civil society organisations. This policy was finalised in 2005 and adopted by the government in 2006.

The policy establishes a framework for the future direction of ICTs and ICT4D within Zambia. Consultation with diverse stakeholders highlighted five priority areas:

- human capacity development
- agriculture
- education
- health
- the development of ICT services.

Health worker visiting a woman who looks after orphans whose parents have died of AIDS. Health has been highlighted as a priority area which can benefit from ICTs in the national ICT policy.
GIACOMO PIROZZI │ PANOS PICTURES

Pillar	Objective
Human resource development	Build the skills required for Zambia to become a knowledge-based society
ICT services	Develop a competitive local ICT industry
Telecoms infrastructure	Increase access to ICT services and expand the national backbone
Legal and regulatory framework	Create an enabling framework for competitive, converged telecoms/ICTs
e-government	Improve management and delivery of government services
e-commerce	Promote Zambia's participation in international trade
Agriculture	Improve productivity and competitiveness of agriculture
Education	Integrate ICTs in education and develop research and development and ICT production sectors
Health	Use ICTs to improve the quality of access to healthcare at a local level
Youth and women	Use ICTs to mainstream youth and women in all development sectors
Tourism	Integrate ICTs in the tourism sector and protect the environment
Security	Address individual and institutional concerns about online security
Content and cultural heritage	Promote public access to information and cultural heritage
ICT services	Develop a competitive local ICT industry

Source: United Republic of Tanzania (2003)

Beyond these priorities, the policy establishes 13 pillars of ICT activity, each with its own goals, implementation strategies and stakeholder commitments. These pillars are listed in the table on the left.

The report suggests that the main problem with this national policy has been the length of time taken to put it into place, partly because of the absence of a specialist ICT ministry within the government. As a result of these delays, the potential for ICTs in development remains largely unfulfilled in Zambia. While the content and intentions of the policy were clear during consultation, a great deal of time has elapsed since they were agreed. Technology and markets have changed substantially in that time, particularly in the use of mobile telephony. To be fully effective, the policy now needs extensive review and change at both strategic and implementation levels.

In practice, little of the policy has yet been implemented by the government. Although a new ICT Act introduced changes in the legal and regulatory framework in 2009, it has not been accompanied by significant initiatives to raise awareness of the value or potential of ICTs in the community. Advocacy work of this kind has been largely limited to the private sector and civil society. However, the private sector has not been adequately involved in implementation planning.

In reviewing the policy, the report suggests that policymakers should take note of NGO experiences with ICTs. As elsewhere, Zambian NGOs have found that large-scale, centrally-managed ICT programmes have been less successful in achieving positive changes in poor communities. Projects which have begun on a small scale, focused on community problems rather than technology, using local languages and local volunteers, and with multi-stakeholder participation, have proved to be more sustainable and have achieved greater impact.

Empowering rural communities through ICTs

Linknet is an innovative project run by the international organisation Macha Works. It provides isolated rural communities with access to the internet. The required technology is installed in shipping containers which can then be transported to remote areas. These are then connected to a satellite dish. Local ICT specialists are trained to set up the equipment and infrastructure is provided so that they can exchange knowledge and experience.

In rural Macha, the project provides local internet access and helps local people learn ICT skills that relate to their interests and concerns and to rural development. Macha Works has built up a broad coalition of partnerships in Zambia, Southern Africa, Europe and the USA to help it provide innovative ICT solutions. It has received requests for Linknet Resource Containers from other rural communities in Zambia and has plans to expand the project to more areas.

Using computers inside the Linknet Resource Container – an internet resource centre built inside a shipping container which can be transported to remote rural areas.
MACHA WORKS

Up-to-date information about commodity prices via mobile phone puts farmers, like this banana farmer, in a better position to negotiate terms with transporters and agents.
CRISPIN HUGHES | PANOS PICTURES

Information for farmers via mobile phones

The Zambia National Farmers Union (ZNFU) operates an information service which is available by SMS to anyone who has access to a mobile phone. It provides details of commodity prices and is aimed at small-scale farmers. Farmers who have produce for sale can find out the best price they are likely to get for their produce in their district. They get both the prices and the contact details of potential buyers. This saves the farmers from being at the mercy of transporters as well as third-party agents who would offer farmers their prices rather than the current market price. Prices are updated on a daily basis and more detailed information is available from ZNFU officers as well as a website, www.farmprices.co.zm. In a similar manner, Cropserve, a supplier to the farming community, is piloting an SMS- and web-based service that provides guidance and pricing for inputs such as seeds. They are in the process of offering veterinary services through the same channels.

Challenges to ICT in Zambia

The report identifies a number of critical challenges facing three key stakeholder groups – ICT consumers, ICT service providers and the regulatory authority.

ICT consumers

■ The biggest challenge facing potential ICT consumers is the high cost of equipment and broadband services. ICT equipment is already expensive for the citizens of a country with a per capita GNP which only just exceeds the cost of a single personal computer. The cost of PCs and peripherals such as modems is pushed up further by high rates of taxation. And costs for broadband services are high – around US$100 per month, compared with around US$20 in Europe. As a result, only the wealthy have access to the internet in their homes and offices, while most consumers rely on telecentres and cybercafés.

■ Consumers also have little awareness of quality of service issues and there is little protection against unsatisfactory performance by operators and ISPs.

ICT service providers

■ Poor access to international infrastructure, leading to high broadband prices, is the biggest challenge facing communications service providers in Zambia. Although new undersea fibre optic cables may increase capacity and reduce bandwidth costs, as a landlocked country Zambia will still need to access these through overland links and so the outcome for service providers and consumers is uncertain.

■ Service providers feel that the relatively inflexible regulatory regime is also a challenge. The time taken for new technologies to be approved has delayed the implementation of services such as Voice over Internet Protocol (VoIP). They are also critical of the 5 per cent commission on gross income that has been levied to finance universal access, even though tenders for the universal access fund were not invited until 2009. This levy is high by international standards and exceeds the dividends to shareholders.

■ Thirdly, current local service providers, particularly the numerous local ISPs, may not be sustainable businesses. The report questions whether the market can sustain as many as 20 ISPs, and warns that local businesses may be taken over by regional multinationals, which play a major part in the African ICT sector.

The private sector should address the needs of small and medium-sized businesses, particularly female traders like this market stallholder in Mongu.
SEAN SPRAGUE | PANOS PICTURES

Regulatory authorities

The 2009 ICT Act has granted increased autonomy to the new regulator ZICTA compared with its predecessor CAZ. These changes may address some of the barriers to ICT provision.

However, the fact remains that there has been no high-level, identified champion for ICT4D in the Zambian government. The Ministry of Communications and Transport has lacked capacity, and it has failed to progress the national ICT Policy in a timely manner. An enabling national climate for ICT investment and adoption is crucial, but this will require closer cooperation between different government departments and between government and the private sector, including public–private partnerships.

Other regulatory issues raised by local stakeholders include:

■ the implementation of universal access, including the development of broadband access

■ the lack of regulation on the sharing of communications resources between operators

■ the absence of performance monitoring

■ uncertainties concerning the regulation of internet content

■ inadequate power infrastructure to support ICT services

■ the implications of convergence between telecommunications and other communications sectors in terms of regulation and licensing.

Summary and recommendations

While positive results have been achieved with ICTs in Zambia, as in several other Southern African countries, considerably more needs to be done to address the challenges of and weaknesses in policy design and implementation.

The current ICT market in Zambia is concentrated in urban and industrialised areas, leaving many areas and poorer social groups with limited ICT access. The government has a responsibility to provide services to the people as a whole, and should work alongside the private sector to do this.

In particular, the government and private sector should provide better access in rural areas, and the private sector should address the needs of small and medium-sized businesses, particularly female market traders and small-scale farmers. More attention should be paid to developing hardware and software that are affordable and relevant to the needs of poor communities.

ICTs have considerable potential in Zambia, but only if the necessary infrastructure and an enabling policy environment are put in place, drawing together government, business and other stakeholders to pursue a shared strategic model. The government, in particular, needs to address issues of connectivity, ICT governance, privacy, security, intellectual property and resource mobilisation.

At the same time, care should be taken to ensure that ICT programmes in Zambia are not just technology-driven. Instead, they should respond to the needs of the poor, in terms of content, language, skills required, design and price. It is important to address sectors that are directly relevant to poverty reduction and where the use of ICTs can make a difference. Local communities should be involved in the design of universal access programmes through consultation, surveys and demand studies.

The policy environment

- The needs of communities should be assessed and incorporated into ICT policy and roll-out plans for underserved areas. This will require coordinated effort in government, to ensure that ICTs are incorporated by appropriate ministries into policies on healthcare, nutrition, clean water and civil rights

- Consultation should take place, allowing all stakeholders to contribute to policy design and implementation.

Building ICT infrastructure

- Public–private partnerships should play a leading role in the development of a national fibre optic network. This will require coordination between operators of fixed networks to ensure that installations are not duplicated while other areas remain unserved

- The government and private sector should also collaborate to provide telecentres in rural areas, offering ICT access and training. Zambia could learn from the success and failure in telecentre deployment elsewhere in Africa.

Increasing access to equipment and software

- Currently high taxes should be reduced on imported ICT equipment and software, and tax breaks should be used where appropriate to accelerate ICT adoption

- The government should encourage local software developers to develop small-scale packages that are suitable for local market conditions.

Building human capacity

- The government should undertake an ICT awareness campaign in collaboration with civil society organisations, using established media and delivered in local languages

- Rural populations in particular should be persuaded of the economic benefits of using ICTs. This will require substantial ICT literacy training, but will be important in reducing the economic and knowledge gap between urban and rural communities

- The Ministry of Education should include ICT teaching in schools and address the shortage of ICT skills among teachers.

Community needs should be assessed and ICTs should be incorporated into policies on healthcare. Existing groups, such as these villagers meeting to discuss healthcare, could facilitate this process.
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Woman at computer at the
LinkNet Information Technology
Academy (LITA)
MACHA WORKS

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The full report, *Contextualising Information and Communication Technology for Development (ICT4D) in Zambia* is available for download from **www.ngopulse.org/files/Zambia_Research_Report.pdf**

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