TI-UP Briefing Note: ICTD and the Digital Divide in Africa – Focus on Infrastructure

Briefing note prepared by the TI-UP Resource Centre (WSP International Management Consulting)

Executive Summary

This briefing report is written as a reference document for those seeking to gain an understanding of the 'digital divide' in Africa with a focus on ICT infrastructure. It is not intended as an academic, quantitative or exhaustive summary of ICT development in Africa, nor its history, and will only briefly touch-upon concurrent development and infrastructure issues associated with this sector (such as power supply). The report begins with an overview of the wider ICT development goals, provides examples of the problems facing the private ICT sector in Africa, and indicates the latest figures on infrastructure and finance. The final sections look at potential investment pathways in ICT infrastructure – highlighted with DFID-funded case studies – and ends with relevant declarations of the 2010 AU Summit.

This document is complementary to an earlier report, "*Information Communication Technology Development (ICTD) in Africa – Goals and Challenges*" which contains a more general summary of ICTD in Africa.

Addressing the Digital Divide for Development

Africa lags behind every other continent in terms of universal access to ICT services, the quality and speed of these services, costs to the user, and the security and consistency of supply. The nature of these issues and the means to address them are attracting increasing attention from outside the continent, with donors and governments alike keen to promote the positive development effects that access to ICT services engender in marginalised and rural communities. With poor rates of fixed-line density for telecommunications across the continent compared to relatively high rates of mobile technology density, there are also growing calls for the use of 3G and Wifi networks to become the key driver for social and economic development within these communities. The 'real digital divide' is thus increasingly seen as the differential access to mobile technology within the continent itself.

Addressing the digital divide and developing access to ICT and mobile telephony services are generally seen to contribute to development goals through:-

- Access to ICT-enabled micro-financing, with m-banking fast becoming an integral part of remote-community economics;
- Introduction of a new 'free market tool', with individuals using mobile technology to exchange information on goods and prices in rival markets;
- Economic development, with growth of the ICT sector itself generating jobs in related service industries, stimulating further private sector investment in the wider economy;
- Universal access to information for education and healthcare (see Box 1);
- Increasing transparency of government and local government operations, with internal and external communication gaining speed, precision, and efficiency, driving down corruption and cost; and
- Increased participation in local and regional political processes, with empowerment of individuals achieved through social networking and information exchange.

BOX 1: Access to Information

The internet and ICT in general is a tool for the sharing of knowledge and the provision of free information for all on a wide variety of topics. E-learning programmes through ICT hubs or internet cafes in particular can be used to contribute to the MDGs, with development programmes targeted at specific socio-economic or gender groups. ICT can also enable access to information at little or no cost, particularly valuable for schools and higher education establishments across Africa that are unable to afford books and other learning aids. The gathering and sharing of digital information via ICT is also seen as a benefit to health care institutions, with field-medics able to access detailed texts on symptoms and treatments for various ailments through mobile telephone technology.

Despite the well-documented benefits, access to mobile technology and associated ICT infrastructure is still very poor. Roughly half of all Africans do not have access to mobile telephony, whilst the average speed of internet access across the continent (where it exists) fairs poorly in comparison to the west, and even fellow developing economies. The slow development of ICT infrastructure and services in Africa is a result of a combination of complementary factors, principally:-

- The continued existence of **monopolies and duopolies** in the telecoms market: In 2008 only half of all African nations could claim more than two ICT service providers in the private sector. Competition is the lynchpin by which the cost of infrastructure and other capital costs are driven down in the free market system, but the continued existence of state-run monopolies in the telecoms market in some African countries is stifling this competition. Above cost interconnection charges are also often used by dominant operators to restrict small operators from gaining market share both in country, and across national boundaries.
- A lack of **reliable power sources,** particularly in rural areas: ICT relies heavily on a consistent stable power supply, which in itself is an impediment to ICT development throughout the continent: many remote areas have no access to fixed supplies. There is therefore a growing call for projects that integrate development of ICT infrastructure with power infrastructure, particularly where green power technology can be used to generate clean energy for both ICT infrastructure (e.g mobile phone masts) *and* the communities they serve.
- A lack of **supporting infrastructure** and **skilled workforce**: Levels of income and education have been shown to affect take-up of ICT and mobile technology. A lack of relevant skills in the resident workforce is also a barrier to entry, with the private sector often unable to provide the necessary services that maintain and develop ICT networks. The building of capacity in ICT infrastructure must therefore be accompanied by capacity building activities in ICT sector services for the investment to prove sustainable. Education in the *use* of ICT should also be a priority.
- Continued **economic and political instability**: Private sector firms have proven unwilling to invest in AU member states where rates of return are likely to be poor, or the business environment is tenuous and susceptible to fraud or worse. A number of donor-funded private sector facilities have formed to address these issues in recent years, and are gaining increasing attention and funding.
- A lack of **regional co-operation**: Though there have been continued drives to increase cross-border co-operation and infrastructure sharing within the AU, very little has been achieved until now with a distinct lack of regional regulatory and funding frameworks. Wrangling over the cost of the EASSy project (Box 2) is a prime example of how a lack of political focus and consensus has jeopardised development of ICT infrastructure in the continent.

BOX 2: The EASSy Project

The East African Submarine Cable System is a high-speed fibre-optic cable providing ICT services to the coastal nations of East-Africa, from South Africa to Ethiopia. The project is due for completion in June 2010; however, initial timelines were not maintained, largely as a result of disagreements between various parties over the funding structure and ownership of the project. Political intervention resulted in disagreement between private investors interested in make a profit, and government authorities demanding low cost bandwidth access, resulting in delays. Disagreements between South Africa and Kenya regarding access costs have also been cited as contributing to the delay. The number of participants and size of a project exponentially add to the complexity of its operation, requiring strong political and regulatory consensus. The AU must learn from the failures of the EASSy to ensure such issues do not recur in future programmes for similar high-level ICT capacity development programmes.

ICT infrastructure in Africa

The African Infrastructure Country Diagnostic (AICD) is an innovative knowledge program designed to improve public understanding of Africa's current and planned infrastructure, and to highlight areas in which investment is needed. Part-funded by DFID, chaired by the African Union Commission and comprising representatives of the AfDB and NEPAD (see last chapter), the AICD has undertaken unprecedented data collection and analysis on the status of the main network infrastructures in Africa, including those of ICT. In November 2009 it finalised its report "*Africa's Infrastructure: A Time for Transformation*" finding that some US$ 93 billion is needed annually over the next decade, more than twice what was previously thought, to meet infrastructure development needs. Almost half of this amount is needed to address the continent's

current power supply crisis. The new estimate amounts to roughly 15 percent of the continent's gross domestic product (GDP), comparable to what China invested in its infrastructure over the last decade.

The study found that existing spending on African infrastructure is much higher than previously known, $45 billion a year, much of it coming from domestic sources. The study also found that there is considerable wastage to address, representing a further $17 billion in potential savings. However, even if major efficiencies are gained there is still a funding gap of $31 billion across the continent every year, much of it needed for power and water infrastructure in fragile nation states. Relative to the size of their economies, this funding gap is daunting for the region's low-income countries, with 20 of them having a GDP of less than $5 billion. This makes it difficult for individual governments to fund the fixed-costs associated with ICT and other infrastructure development programmes. A wide range of potential funding sources will therefore need to be evaluated, including public budgets, resource rents, local capital markets, private sector and non-OECD finance, as well as traditional donor assistance.

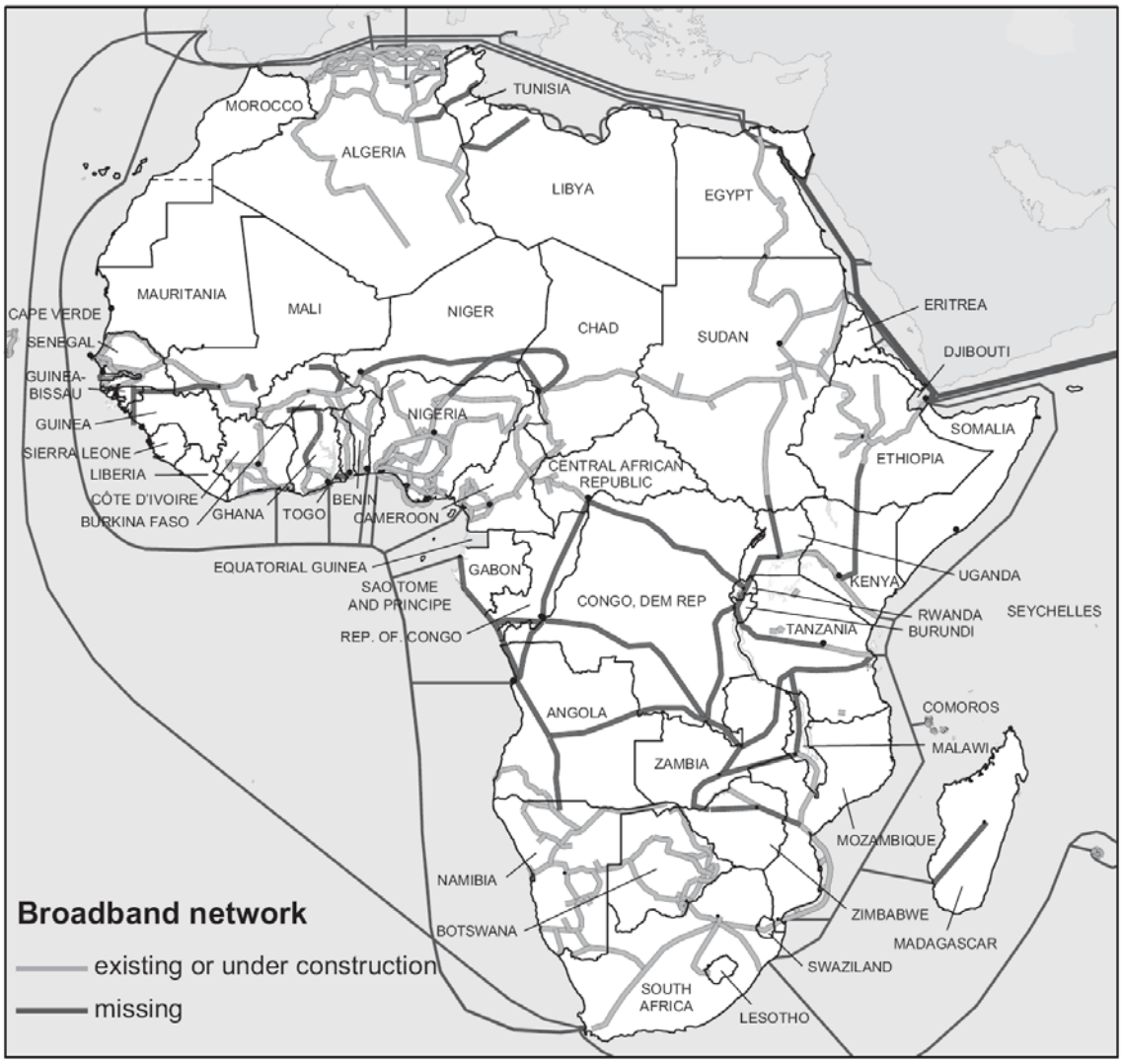

Figure 1: A diagram detailing fibre-optic networks in Africa, existing, planned or 'missing'

Africa's national telecommunication networks are still poorly integrated with each other, and with the rest of the world (Figure 1). The problem is largely one of low-level available bandwidth: almost two-thirds of the countries in Africa remain unconnected to the global network of submarine cables (as of March 2010) and continue to rely on satellites for international telecommunications. As a result, they face high prices for international telephone calls, and charges for dial-up or broadband Internet are at least twice as high as they are for coastal nations with access to submarine cables. Associated transmission capacities are also

low, with comparable speeds of 3bps set against and average of 24bps for countries with access to fibre-optic lines.

Several projects are already under way to complete the loop of submarine cables around Africa, including the EASSy project. The cost of completing the nascent fibre-optic network connecting the capital cities of Sub-Saharan Africa and the main submarine cables is not yet fully met however, with a projected cost of $316 million based on a figure of around $27,000 per kilometre. Rapid progress is already being made in this area, but further investment is required.

The detailed report is available for download at: http://www.infrastructureafrica.org/aicd

Investment Pathways in ICT

A quick analysis of ICT development goals in Africa reveals two levels of infrastructure investment, with one level targeting small-scale projects in marginalised and remote communities, and the other looking at the 'bigger picture' – large-scale capacity building projects often requiring regional co-operation and co-ordination. The issues of connectivity (or the 'digital divide') and the means of addressing it in both streams will be strongly interrelated, but the pathways for investment and the level of involvement of the international and donor communities will be (and is) fundamentally different.

Community-level ICT access is principally achieved in remote areas through mobile technology. The expansion of mobile telephony in the last decade throughout the continent has been driven by the private sector and free market expansion. In addition to donor-led initiatives at the community level designed to educate or provide ICT services for the socially disadvantaged (such as funding grants for ICT community centres), support for the private sector to encourage investment in new and marginalised markets is key. Case Study 1 illustrates how this can be achieved.

Case Study 1: The Private Infrastructure Development Group (PIDG)

Businesses both national and international have proved unwilling to invest in infrastructure projects – or provide the necessary lending facilities – due to inherent market failures/constraints along the project cycle, or the high front-end cost and uncertainty attached to infrastructure development in developing nations. The **Private Infrastructure Development Group** (PIDG) was established in 2002 as a multi-donor initiative to address these issues, and has continued to attract funding from founder members and, increasingly, new funding partners. The PIDG has focused on the provision of project development facilities (PDFs) introduced to improve project development and execution, and project financing vehicles (PFFs) aimed at addressing financial market failures.

Investment (and support for investment) in ICT infrastructure through the PIDG represents a significant proportion of the annual budget. As of end 2009, cumulative and assigned funding for ICT projects totals some US$ 200 million, most of it directed through EAIF (the Emerging Africa Infrastructure Fund) to private sector telecomm firms keen to expand operations and build coverage capacity.

More information on the PIDG and how it operates can be found at: http://www.pidg.org/

National-level ICT infrastructure provision is a question for AU co-operation, with many land-locked nations dependant on their neighbours for access to submarine fibre-optic networks. Debate on access issues of this kind can ultimately expand into other politically sensitive areas such as cross-border energy supply, and water rights in shared river basins. Investments in ICT infrastructure projects designed to expand capacity therefore require a cross-regional rather than national focus, and need to ensure associated infrastructure demands are addressed or accounted for. Case Study 2 provides an example of an infrastructure financing facility with a regional approach, part-funded by DFID.

In addition to investments in physical infrastructure, there is also scope for the international community to invest and build capacity in the ICT services industry in Africa – not just through encouragement of deregulation in telecomm markets, but through knowledge export and provision of high-profile networking facilities at the national level. The Indian government have been a strong leader in this field. Inspired by advances in the provision of healthcare and medical education through the use of ICT, India proposed a formal partnership with the African Union during the inaugural session of the Pan-African Parliament

Case Study 2: The EU Africa Infrastructure Trust Fund (ITF)

The EU-Africa Infrastructure Trust Fund (ITF) is an instrument of the wider EU-Africa Infrastructure Partnership. Operational since June 2007, its aim is to increase EU investment in regional infrastructure in Africa, working together with other initiatives, actors and instruments on the basis of African ownership. The Trust Fund combines grant resources from the European Commission and EU Member States with the technical and lending capacity of the European Investment Bank (EIB) and EU development financiers, in partnership with the African Development Bank (AfDB) and NEPAD. To be eligible for grant assistance, infrastructure projects must be **trans-border projects** or national projects with a regional impact on two or more countries.

The total project cost (TPC) of all Grant Operations approved and cleared in principle for the funding of projects in the investment phase is currently estimated at €1.38 billion, with each euro in approved ITF grants expected to generate over fourteen Euros in total investments (leverage effect or multiplier of 14:1). Investment grants in ICT projects by year end 2009 total €2.6 million, a total currently dwarfed by transport and energy sector project grants.

More information on the EU ITF and how it operates can be found at: http://www.eu-africa-infrastructure-tf.net/

(Johannesburg, 16th September 2004) to aid in the connection of all 53 nations of the African Union via a satellite and fibre optic network that would provide effective communication (from Indian-based ICT hubs and knowledge centres) for Tele-education, Tele-medicine, Internet, Video-conferencing and VoIP services while also supporting e-Governance, e-Commerce, infotainment, resource mapping and meteorological services etc. In response to the proposed initiative, the Government of India proceeded in the set up an e-Network project – now called the **Pan-African e-Network** – with an approved budget of US$ 117 Million (as of end 2009). The network passed a recent milestone in January of this year (2010) with the inauguration of a telemedicine facility at the AU clinic at the Commission's head quarters in Addis Ababa. The project is an ideal example of how international governments can partner with the African Union and its individual member states, to provide funding for ICT infrastructure and service capacity investment whilst also attracting funding and generating business for domestic ICT services and knowledge-led industries.

More information on the Pan-African e-Network can be found at: http://www.panafricanenetwork.com/

The 14th Ordinary Session of the Assembly

Despite an ICT theme for January's AU Summit, very little has emerged with regard to concrete action or resolution in this sector. What did emerge however was a resolution to strengthen the role of NEPAD.

NEPAD, or the New Partnership for African Development, formed in 2001, is a '*vision and strategic framework for Africa's renewal*'. It is designed to address multiple intraregional issues across the continent, and is chiefly concerned with the following: Peace and security; Democracy and good, political, economic and corporate governance; Regional co-operation and integration; and Capacity building. The latter part of its remit includes the co-ordination and creation of funding streams for infrastructure projects, with ICT named as one of its key investment priorities.

As part of the proceedings of the 14th Ordinary Session of the Assembly, the AU approved the establishment of the NEPAD Planning and Coordinating Agency (NPCA) as a technical body of the African Union with the mandate to:

i. *Facilitate and coordinate the implementation of continental and regional priority programmes and projects;*
ii. *Mobilize resources and partners in support of the implementation of Africa's priority programmes and projects;*
iii. *Conduct and coordinate research and knowledge management;*
iv. *Monitor and evaluate the implementation of programmes and projects; and*
v. *Advocate on the AU and NEPAD vision, mission and core principles/values.*

Financing the NPCA and its programmatic activities will be through:

i. *Established budget from the statutory sources of the African Union Commission;*

ii. *Continuation of voluntary contributions by AU Member-States; and*

iii. *Additional budgetary support from Development Partners and the Private Sector in conformity with AU financial rules and regulations.*

Given adoption of the final clause, closer co-operation with NEPAD for all donor and government funded infrastructure projects throughout Africa is advocated.

More information on NEPAD can be found at the following address:
http://www.nepad.org/2005/files/home.php

Further Sources of Information

There have been many NGOs and official institutions formed over the last decade to aid the cause of ICTD (Information Communication Technology for Development) in Africa and the wider developing world. These programmes have primarily focused on community-level ICT capacity building. Further information on ICTD projects at all levels and the organisations that promote it can be found by following these links:-

http://www.researchictafrica.net/
http://zunia.org/
http://www.ict4d.org.uk
http://www.africagathering.org.uk/
http://www.icafrica.org/en
http://www.itu.int/en/pages/default.aspx