Financing ICTs for development with focus on poverty

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I. Introduction

This paper looks at the issue of financing ICTs[1] in support to the development in sub-Saharan Africa from two perspectives: 1) financing mechanisms to support the information and communication needs of the vast majority of African poor (for poverty eradication) and 2) mechanisms to facilitate the exploitation of ICTs to increase the rate of national development and economic growth in the region. The paper argues that ICT financing should primarily focus on the needs, aspirations, capacities and perspectives of the vast majority of poor people in Africa than from the dominant practice where ICT needs are articulated by ICT professionals with predetermined end products. The mainstream ICT financing mechanisms debate should pay a great deal of attention to the needs of the poor. To define financial mechanisms and strategies, we must first address the question of "who is being served for what purpose." Such a spirit would be important to consider access to the poor as a public good and move the digital solidarity agenda forward.

Addressing the needs of the poor is an inherently contextual exercise that requires innovative and distributed financing. A systematic effort to understand the needs of poor, their social and political contexts and the constraints placed on them due to lack of ICTs would be important to:

a) make ICTs more meaningful to those who need information and knowledge the most
b) identify innovative approaches for making provisions for those who cannot afford access to them; and
c) reduce wasteful expenditure in the first place by avoiding transplanting applications that worked in developed country to the contexts of African poor.

The failure of most of e-government projects and poorly designed community telecentres in Africa represents a grim reminder of how transplanting concepts that worked elsewhere stops to succeed in other contexts. Focus on the poor calls for investing in traditional technologies such as radio and televisions that are easily accessible to the poor. It demands facilitating unhindered access to communication and contextual information and knowledge to the poor. It pleads for enhanced intermediation and promotion of access to contextual life saving and empowering information than merely advancing new technologies and applications that may not improve the conditions of the poor.

Since the fundamental pillars of sustainable development such as education, social equality, health, environmental protection are essential to the empowerment of the poor, investment in backhaul and distribution infrastructure, promoting access to meaningful applications in key sectors like health, education and agriculture, advancing innovation, research, education and entrepreneurship that underpin the capacity to tailor ICTs for local needs are as important as promoting access to the poor. The potential of ICTs stem from their information processing and knowledge sharing features; and these features cut across all these sectors. Internet has become the most efficient means for communications, trading

[1] ICTs in this paper comprise a spectrum of communication and information delivery tools as well as knowledge sharing technologies from radio, television, film, press to people, systems, institution and infrastructure supporting them.

and delivery of services and goods in Africa. Effective deployment of the Internet would increase earning opportunities and improve the delivery of basic services like health and education. For ICTs to make these impact on the majority of the poor, there should be affordable access to it and sufficient human resources and technical capacity to create and use applications and content and an enabling policy environments to foster entrepreneurship.

Yet, it is important to take note of the fact that each country and community has unique sets of ICT needs and priorities. The needs are extraordinarily diverse. Therefore adequate effort is needed in designing, prioritising and implementing ICT programmes and reorganising resources and needs than relying on predefined "one size fit all" priorities.

A very rough ballpark estimate shows that sub-Saharan African countries need US$600-900 million beyond the resources currently available through traditional sources including the private sector and multilateral and bilateral funding to meet the information needs and empowerment of poor people. Such a resource should be available by means of a global digital solidarity with Africa, specifically within the framework of financing public goods. While efficient use of existing resources and improving legal and regulatory framework is important to attract further donor funding and private sector investment, it is increasingly becoming apparent that new innovative sources of financing should be pursued to take access to information and knowledge to the poor from where it is now to the next level.

In addition, the ability of African poor to improve their livelihood is not only limited by lack of access to ICTs, information and relevant applications in key sectors, but also by a complex web of constraints ranging from unresolved problems of governance and injustice at the local levels and the dynamics of the global economic system[2]. In effect, the implications of policy and governance should not be underestimated. There can be no sustainable infrastructure without adequate education, food security or reliable energy source; there can be no wide distribution of ICTs without enabling policy and regulatory environment and there can be no enabling environment without optimal governance.[3]

The quality of local governance does not only determine the characteristic of the policy and regulatory environment that ideally promote optimum private sector investment and public and private sector partnership but also affects the extent to which resources are mobilised and those that are invested benefit those who need access the most. It is more likely to find limited access to ICTs in the most corrupt institutions or countries than in those with good governance structures.

The participation of African countries in global governance issues, their access to trade and debt relief remain critical for their improved participation in information society. Financing the mainstreaming of ICTs in health and education will not make sense if the debt burden makes it virtually impossible for African governments to maintain adequate programmes of public education and health in the first place. Fairer access to trade will encourage optimum use and appropriation of ICTs. The discourse on financing ICT for development should therefore encompass frank evaluation of the impediments associated with local governance, the global trade regime and rule of the game and the broader debates on debt relief.

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[2] Cynthia Hewitt de Alcantara - The Development Divide in a digital Age: an issue paper ftp://ftpserver.unicc.org/unrisd/outgoing/pp/tbs/hewitt.pdf

[3] Final Communiqué of African Development Forum: the Challenges of globalisation and information age, http://www.uneca.org/adf

This paper will not delve into the issues of governance at local and global levels but rather focuses on financing the development of ICTs in Africa. The text is divided into seven sections. The second part analyses the socio-economic and political context that informs ICT financing in Africa. The third part discusses progress in financing ICT for development with specific bias towards interactive technologies followed by a synthesis of lessons and issues that have emerged from experiences so far. The fifth section outlines areas for further financing requirements in support of poverty eradication and economic growth in Africa and provides some strategies as to how to estimate resource needed. The last section focuses on mechanisms for meeting the financial shortfall beyond those available through domestic public sources, development agencies and private financing. This section introduces financing within the perspectives of digital solidarity and global public goods for addressing the access needs of the vast majority of the African poor.

II. The development context of ICT financing in Sub-Saharan Africa

Sub-Saharan Africa consists of thirty-four of the fifty least developing countries and fourteen of the thirty-two landlocked countries[4] that are confronted with the most daunting economic, social and political challenges – high incidence of poverty, wider income inequality, internal civil strife and external conflicts, scourge of disease including that of HIV/AIDS, high costs of the basic infrastructure (including telecommunications); limited human and technological resources; dependence on a limited export market; debt burden; low productivity; acute vulnerability to natural and environmental disasters, and more importantly over dependence on foreign aid. Over 40 percent of the population in Africa earns less than US$1 a day – below a poverty line drawn by the World Bank[5].

In effect, the incidence of poverty is increasing in some countries rather than abating and the income gap is widening. For example the incidence of both relative and extreme poverty in Djibouti rose dramatically between 1996 and 2002 from 45 to 74 per cent and from 9.6 to 42 per cent, respectively[6]. So is the marginalization of small farmers, women and rural youth. Economic growth is declining in a number of countries and some countries recording a negative growth rates. A report by the Economic Commission for Africa in 2004 shows that seven countries including Zimbabwe (-11.2%), Ethiopia (-3.8%), Seychelles (-2.8%), Côte d'Ivoire (-2.3%), Guinea-Bissau (-1.8%), Central African Republic (-0.7%), and Burundi (-0.3%) have recorded negative growth rates in 2003[7]. Not considering the differences on these figures, the progress in most Africa countries shows that efforts to improve the conditions of the vast majority of people needs to be redoubled and should be innovative.

The majority of the African population lives in rural areas and dependent on fragmented subsistence farming, livestock and agriculture and informal trading. This subsistence economy is often subject to various external shocks such as variable rainfall, pests and disease and price fluctuations. The rural poor lacks access to input, advice and markets and faces a high information and transaction cost due to weak infrastructure such as roads and telecommunication, deficient institutions and layers and layers of intermediaries. The poor people are also concerned with educating their children, maintaining their well-being and access to money and skills to improve their livelihoods. The ICTs that make impact on these problems are imperative.

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4 Least Developing Countries Resources, http://www.un.org/issues/m-ldc.asp

5 see, http://millenniumindicators.un.org/unsd/mispa/mi_worldregn.aspx

6 Djibouti ICT Action Plan, 2003, http://www.mccpt.dj/Documents/Action%20plan-djibouti.pdf

7 Economic Commission for Africa (ECA) (2004), Economic Report on Africa, 2004. http://www.uneca.org/era2004

Armed conflict is the one of the most important determinant of poverty. It makes the African region rather unique compared to other regions. Sub- Saharan Africa (SSA) stands out from other developing regions in terms of the sheer number of conflicts, their persistence and the massive impact on the lives and livelihoods of civilians as well as combatants. Africa accounted for 53 of the armed conflicts in the world in the 20th century. The region hosts some of the major hot spots including conflict in Darfour in Sudan to stability problems in Burundi, Cote d'Ivoire and Democratic Republic of Congo. The cost of conflict has been immense – conflicts do not only destroy the precarious infrastructure but also divert the precious resources that could have been spent on improving the livelihoods of the majority of people. Countries emerging from conflict need a considerable support to build the ICT infrastructure and empower traumatized people to regain confidence and their livelihoods.

Moreover, the combined forces of major killer diseases HIV/AIDS, malaria and tuberculoses are taking tolls on African development. Sub-Saharan Africa has just over 10% of the world's population, but is home to two-thirds of all people living with HIV[8]. The HIV/AIDS pandemic that killed over 2 million people in 2003 and the infected well above 25 million so far has exacerbated the economic situation reversing the gains made in 1980s and 1990s. The steady increase in the number of people living with HIV and increasing impact of malaria and tuberculosis in sub-Saharan Africa shows that far more concerted efforts are needed in intensifying information, education and communication using innovative approaches to information seeking and influencing actions by individuals, families, communities and governments.

Although political inclusiveness and accountability is improving over the years, the quality of public sector management in Africa remains very weak.[9] Consistent problems of political instability and poor governance, high levels of corruption, poor service delivery and violation of human rights still plague a significant number of African countries. The extent to which governments encourage high standard service delivery, the involvement of citizens in political and economic development, curb corruption, advance competition, promote diversity and ethics within the media, foster transparency, honor human rights determines the space for the development of the information society in the region. It is difficult to bridge the access and information gaps without well-established governance.

Apart from domestic problems of disease, poor governance and insecurity, Africa faces a significant challenges imposed by the global financial and trade regimes. Part of the forces that controls Africa's destiny is beyond its sphere of influence. Despite the support from donor agencies, multilateral, regional and sub-regional cooperation arrangements that far exceed other regions, gains in local economic development and participation in global trade and financial regimes have been slow. The Structural Adjustment Programmes that were imposed by the International Financial Institutions have not led to the desired results of fostering growth and improving Africa's access to foreign markets. In fact these had a major social and human costs. Furthermore, foreign direct investment and per capita income declined, debt has increased and debt services have mounted. The financial flow that comes either from consessional loans or grants has continued to be offset by terms-of-trade losses and due to extreme dependency of countries on a narrow range of commodities like coffee, copper and cacao. Recent initiatives by the G8 countries, particularly by the British government has opened for opportunities for addressing these

[8] UNAIDS, http://www.unaids.org/en/geographical+area/by+region/sub-saharan+africa.asp
[9] UNECA, Synopsis of the 2005 African Governance Report, http://www.uneca.org/agr

complex issues that have significant impact on the development of information society in Africa.

In response to being marginalized by global trade relations and realising the need to harness the collective resources of Africa, a number of regional and sub-regional structures have been put in place. Regional and sub-regional structures or blocs including the Economic Community of West African States (ECOWAS), Common Market for East and Southern Africa (COMESA), Southern African Development Community (SADC) and the African Union focus on establishing single markets of economic and monetary union and reinforcing regional integration and mutual support. The New Partnership for African Development (NEPAD) is the latest initiative with aims of establishing international partnership with developed countries in an exchange for commitment by African governments to prevent conflict, promote and protect democracy and human rights, restore and maintain macroeconomic stability, extend education and health services and promote infrastructure development including ICTs.

NEPAD began with the South African President Thabo Mbeki's vision of the African Renaissance, an insight that if Africa were to unleash its economic and political energies, it could achieve accelerated development. Mbeki's vision converged with a concern of African Union leaders that the continent needed a rapid solution to its debt crisis. Nigerian President, Olusegun Obasanjo was mandated to work on this problem. The outcome was a more comprehensive version of the Millennium Partnership originally proposed by Thabo Mbeki, and specifically the idea of a double contract between African governments and their citizens, and between Africa and the developed nations the developed countries. President Abdoulaye Wade of Senegal whose Omega plan dealt with similar issues joined the group and mandated with Africa's infrastructure development. Wade has been instrumental in fashioning out the African information society agenda lately through his well-regarded Digital Solidarity Fund proposal.

Although NEPAD had many shortcomings including lack of wider public participation in its progarmmes and deliberations, its spirit of "contracts between government and people, between developed countries and Africa" represents a useful framework for advancing and financing ICTs in African development. Information and communication technologies are high on the agenda of NEPAD and its debate with international development actors. Recently there has been substantial interest in the NEPAD ICT infrastructure debate and programmes by different institutions and countries.

The Sub-Saharan Africa is the least developed region when it comes to the ICT infrastrcture. Moreover, there is a wide and uneven disparity along the fault lines of social inequality including socio-economic status, age, gender, geographic location and ethnicity. The penetration of different technologies vary considerably – with broadcasting technology more diffused than PCs and the Internet. Of the approximately 841 million people in Africa in 2003, it is estimated that only[10]

?1 in 4 had a radio (210m)
?1 in 12 had a TV (71m)
?1 in 33 had fixed line (25 m)
?1 in 16 had a mobile phone (51m)
?1 in 80 had access to a PC (10.3m)
?1 in 70 had access to the Internet (12.3m)

[10] International Telecommunications Union, 2004, African Telecommunications Indicators, 2004 and estimates

?1 in 360 had access to pay-TV (2.3 m)

As discussed in section V, raising access to radio to at least 100%, television to 25%, phones to 10%, mobile phones to 25%, computers and the Internet access to 5% is required to achieve same goals stated in the NEPAD contract with the developed world, contribute to poverty eradication and economic growth and to support the Millennium Development Goals. This implies that efforts should be made to increase access to broadcasting technologies while making sure that the benefits of new interactive technologies shared widely by all men and women including those in remote areas. However, as access moves beyond radio and telephones to more strategic and interactive technologies like the Internet, costs will become high, because resources are required to build broadband infrastructure to provide network access, pay for electrical infrastructure to make the ICTs work, develop skills infrastructure to keep all the technologies to work and improve usage skills and increase literacy in order to read the content[11]. As well, the rate of penetration of the Internet in Africa is declining recently compared to the explosive growth in the past decade; a suggestion that improving access to more interactive technologies to rural areas remains challenging and expensive.

All of the above points to the fact that ICT financing should be seen from improving the condition of the poor - giving them voices, enabling their access to contextualised information. ICTs should also contribute to the promoting good governance, curbing the challenges of disease and ignorance and enforcing peace and security in Africa as a whole.

A weak information and communication infrastructure is a major bottleneck to regional and international cooperation, trade and investment. Connectivity improves network externalities, but those in Africa with limited connection will have no access to the wide network of people and resources around the globe. Their access to trade opportunities and jobs are curtailed by lack of access to infrastructure and resources. Furthermore, to promote a virtuous circle countries should enhance complementary mechanisms such as education, research, investment framework, effective institutions, supportive infrastructure like electricity and markets. These require a considerable innovation in financing mechanisms using a mix of resources and complementary tools like market access and debt relief and built on lessons and experiences so far.

III. Progress in financing ICTs in Africa

Africa has a relatively extensive experience in ICTs financing and digital solidarity that needs to be built on. Before the 1990, the financing of the sector was focused on the development of telecommunications infrastructure. Funds from bilateral institutions and multilateral development banks were spent on transfer of technology and the expansion of ICT capacities of public institutions to collect, store, process and disseminate information. Bilateral and multilateral donors provided support to national telecommunications infrastructure development plans while foundations subsidized champions to link academic and research institutions. The World Bank and the United Nations agencies including UNESCO, UNIDO and UNDP and bilateral donors like USAID were among the institutions that funded early IT projects. Domestic contributions have historically been

[11] Heeks, Richard, 1999, Information and Communication Technologies, Poverty and Development, http://idpm.man.ac.uk/idpm/diwpf5.htm

very small. External funding accounted for over half of the national equipment and technical assistance in Africa in the mid 1980s[12].

At the end of 1980s, the United Nations Scientific and Cultural Organization (UNESCO) and the International Development Research Centre (IDRC) promoted an International Information System for the Development Sciences (DEVSIS) model that was built around centralized input, centralized processing and decentralized distribution system and that naturally mirrored mainframe and mini-computer models of those days. In collaboration with the UNDP these institutions financed the establishment of the Pan African Documentation and Information System (PADIS) with the aim to develop an African central node with contribution from national and regional institutions that would maintain their own databases and exchange information with the central PADIS system[13].

International donors who saw the long-term benefits of connectivity began supporting the introduction of low cost networking technologies in early 1990s. By 1991, the Coopération Française through its research arm Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM) initiated its Réseau Intertropical d'Ordinateurs (RIO) project created links to Burkina Faso, Cameroon, Cote d'Ivoire, Madagascar, Mali, Niger and Senegal. RIO nodes were originally set up to bring electronic communications network among ORSTOM researchers. In 1992 it was decided to open the network to anyone involved in academic, research and development work. Since then, the network grew substantially with nodes being established in 12 French-speaking African countries that served about 500 users in 60 organizations. RIO was able to connect outlying countries like Madagascar and Republic of Congo and build one of the few resources of TCP/IP and UNIX expertise in Africa that were instrumental in extending full Internet connectivity to the rest of the region. The International Development Research Centre (IDRC) was another institution that supported ICT initiatives during these early years. After piloting five separate projects in 1992 [14]IDRC, funded a Capacity Building for Electronic Networking in Africa project with the aim to connect 24 African countries.

A turning point to financing the development of ICT with focus on the Internet began in 1992, when UNESCO's Intergovernmental Informatics Program (IIP) through finance from the Italian government launched a Regional Informatics Network for Africa (RINAF). RINAF played a significant role in disseminating the concept of the Internet protocol by forging links with the Internet Society[15]that later emerged as key advocate to Internet diffusion in Africa. The project in collaboration with the Network Start Up Resource Centre (NSRC)[16] based in Oregon, USA and the Internet Society was instrumental in introducing the vanguard African ISP managers to Internet protocol (IP) concepts as of 1993.

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[12] Odedra Straub, Mayuri, Is Information Technology Really Transferred to Africa? http://www.straub-odedra.de/Artikel/27%20-is%20infromation%20technology.pdf

[13] Hafkin, Nancy and Kate Wild, ICT in Africa: The Challenge to Donors in the Global Information Society, In Rowing Upstream - http://www.piac.org/rowing_upstream/chapter5/full_chapter_5.html

[14] The five IDRC projects were: 1. NGONET - linked Non-Governmental Organizations, 2. ESANET – to connect universities in east Africa including Kenya, Uganda, Tanzania and Zimbabwe, 3. ARSONET – to connect regional standards organizations, 4. HEALTHNET - to connect medical practitioners and 5. PADISNET – for connecting national and regional information centers that were part of the Pan African Development Information System at that time

[15] Evaluation of RINAF project by Mike Jensen available at http://unesdoc.unesco.org/images/0011/001137/113766eo.pdf

[16] http://www.nsrc.org

The UNDP was another agency that initiated two ICT projects at that time. The Sustainable Development Networking Programme (SDNP)[17] was launched in 1992 with the aim at to promote connectivity between the users and suppliers of information of that directly related to environment and sustainable development following the Rio Declaration on Environment and Development. UNDP also launched the Small Islands Developing States Network (SIDSNet)[18] in 1994 to examine the feasibility of establishing an electronic network for assisting the social and economic development of the small island nations such as Cape Verde, the Comoros, Mauritius, Sao Tome & Principe and the Seychelles. The work of these projects provided an impetus for entry of small private ISPs into the African market.

The holding of Africa Telematics Symposium in 1995 and the Information Society and Development Conference in South Africa in 1996 was instrumental in stimulating a number of partnership programmes between development agencies and the articulation of national programmes by countries. There was ample enthusiasm and solidarity at the time. Over 17 projects worth of US$80 million were launched around 1996 by various donor agencies. The launching of the African Information Society Initiative (AISI) in 1996[19] with a core mission of assisting African countries with ICT policy making was behind the design of a number of e-strategies. By 1999, there were ten countries that formulated their national e-strategies. Over 35 African countries have now developed their ICT strategies that expect to be financed using a mix of sources.

The World Bank, the IMF and the ITU besides funding pilot ICT projects and promoting infrastructure development programme were instrumental in financing technical assistance for promoting reforms in the telecommunication sector to increase private sector investment. The efforts were relatively fruitful. The first ten private investments in incumbent monopoly were achieved between 1995 and 1997. The USAID funded a regional telecommunications restructuring programme in Southern Africa and launched Leland Initiative in 1996 with focus on the creation of enabling policy environment, strengthening the ICT infrastructure and improving the use of the Internet for development. IDRC launched the Acacia initiative - a multi-faceted program addressing policy, technology, capacity and content issues with a strong research focus.

These and other programs seeded much valuable activity on the policy and regulatory fronts and in many application areas. They also forged partnership, alliance and solidarity among actors. The private sector seized the opportunities of policy reform and invested in the Internet services, value added networks and mobile markets. The number of private Internet service providers increased from a mere 84 ISPs[20] in 1996 to 450 in 2000. Private investors played a key role in expanding the African mobile landscape where the cell phone penetration bypassed fixed lines in 2001. Today, there are a few African countries where purely state-run operators have mobile operations. The top six providers (MTN, Vodacom, Cetltel, Orange, Milcom, and Orasom) accounted for 33 million subscribers in 2003 or a the total revenue of close to US$6.6 billion.[21] Similar progress was made in the participation of private sector in the Value Added Network services market covering aspects such as paging, private voice and data connections to satellite, public telephone, mobile trunked radio and other broadband services.

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[17] http://www.sdnp.org/

[18] http://www.sidsnet.org/

[19] African Information Society Initiative, http://www.uneca.org/aisi

[20] Mike Jensen, Internet Update for ISOC Geneva's DEVSIG Meeting, http://www-sul.stanford.edu/depts/ssrg/africa/24connec.html

[21] ITU, 2004, African Telecommunications Indicators 2004

The process and availability of funding form different sources in 1990s unleashed creativity in the delivery of Internet and universal access to the poor. The establishment of telecenters and extending services to rural areas were among the key concepts promoted by the donor agencies since the mid of the 1990s. The rise and fall of telecentres also demonstrated the need to bring diverse sets of skills including telecommunications and content/information together with local ownership and applications to development sectors.

However, the approach through most of the 90s was essentially experimental and underpinned by the belief that the liberalization of the telecommunications sector and the empowerment potential of ICTs would overcome the major traditional constraints on development and allow countries to move quickly into an era of greater prosperity[22]. This was partly prompted by the integration of telecommunications into the rules of the World Trade Organization (WTO) and the belief that market forces would lead to better access to infrastructure. However, it soon became clear that liberalization or the imposition of free-market conditions onto the inequitable conditions in the region without programmes of redress, would simply reinforce the iniquitous status quo[23] or could lead to transfer from public monopoly to private one. It also showed that investment in ICTs is more than opening up the telecommunications sector or establishing telecentres. It requires regulatory capacity, political will and a competitive environment. While mobile access grew tremendously due limited regulatory oversight and the "pay as you go" business model that suited everyone, fixed line connectivity stagnated. The main lesson was that the barriers to ICTs in development in Africa are much wider than enabling policy and regulatory environments. The decade was ended without making a dent to universal access to ICTs and actually attaining full liberalization and universal access in most Africa countries.

However, the end of the decade brought the promise of greater resources for information society initiatives in developing countries from the G8 countries, following commitments made at their 2000 Okinawa Summit. The G8 established a Digital Opportunities Task Force that worked on specific recommendations by involving stakeholders from civil society and the private sector. The beginning of the new Millennium also saw the first session of the UN's Economic and Social Council (ECOSOC) dedicated to exploiting the potential of ICTs for development – giving the whole gamut of information and communication for development issues a higher international profile than ever before. The ECOSOC meeting was followed by Millennium Summit that called on the UN "to play a leadership and catalytic role in helping to bridge the digital divide and accelerate development by harnessing the development potential of information and communication technologies (ICTs)". The UN established a Special Task Force to provide overall leadership "to formulate strategies for ICTs development and putting them at the service of development for all to forge a strategic partnership between the United Nations system, private industry and financing trusts and foundations, donors, and countries."

The recommendations of the G8 Digital Opportunity Task Force and that of the UN ICT Task Force were taken up by some countries like France, the United Kingdom and Canada to finance ICT for development in Africa. Canada funded a resource center for ICT strategies and launched connectivity Africa project in 2002 while DFID resorted to a number of interconnected catalytic initiatives to promote local negotiations between civil

[22] Kate Wild, Notes on ICT for development, personal communication
[23] Alison Gillwald, Policy and Regulatory Challenges of Access and Affordability, www.lirne.net/resources/netknowledge/gillwald.pdf

society, regulators, policy makers and the private sector to advance ICT diffusion in Africa[24]. The French Government launched a project called ADEN with the aim to lower the cost of Internet access by sharing cost, raise the demand for connectivity, encourage effective use of the international bandwidth and exchange of experience between countries. The DOT Force, the UN ICT Task Force and the World Economic Forum were also instrumental in forging international coalition of representatives from private and public sectors and from the civil society. The International Telecommunications Union (ITU), the World Bank, UNDP, and an increasing number of bilateral donors have also taken the integrated approach to formulate IT strategies in Africa and to incorporate ICTs in their country assistance progammes. New players, several of whom had not been involved in development efforts previously came onto the scene, both individually and in partnership with others[25]. Multinational private sector foundations such as CISCO, Kellog, Markle and Hewlett Packard have begun financing ICTs for development. Although not well coordinated, these corporations have programmes in ICT for development in Africa.

The holding of the first African Preparatory Meeting for the Geneva phase of the World Summit for the Information Society in Bamako in 2002 was useful in expanding the debate on the role of these different actors and on how to prioritise the African ICT projects. The idea of digital solidarity fund was also seeded in Bamako. Subsequent discussions focused on digesting and merging a number of ICT priorities including those proposed by the African Information Society Initiative, the Bamako Bureau list of priorities and those put forward by NEPAD for submission to the first phase of the World Summit for Information Society. These priorities have tendency to replicate each other. Table 1 lists major priorities identified by NEPAD and the African Information Society Initiative.

Table 1. Overlapping Priorities for ICT in African Development

NEPAD Priorities[26]	✍ e-policies and e-strategies including facilitation of policy and regulatory reform ✍ Infrastructure development to achieve better teledensity ✍ Facilitate access to broadband infrastructure (East African Submarine Cable project and Broadband Access project for African landlocked countries) ✍ Special programmes with focus on youth and women ✍ Human development (e-Schools, e-Health, e-skills) ✍ Institutional Development, Capacity Building, R&D ✍ Business development and entrepreneurship ✍ Establishing new regional Internet registries ✍ Harness ICTs to meet key NEPAD goals (conflict prevention protecting democracy, human rights, macroeconomic stability, market access, human development, building capacities of the private sector ✍ Promote local content ✍ e-Applications (e-Commerce, e-Government, e-law, etc) ✍ Internet and Software Development ✍ Improving public e-awareness
AISI priorities	✍ ICT infrastructure development

[24] see, http://www.catia.ws
[25] Hafkin, Nancy and Kate Wild, ibid.
[26] http://www.eafricacommission.org

and ADF'99[27]	✍ Human resources development (African Learning Network – e-schools, varsitynet, Out of School youth network) ✍ National, local and regional information and communications infrastructure plans ✍ Applications (E-governance, e-health, e-education) ✍ Promotion of content (local languages, local content) ✍ Advocacy for ICT for development and poverty reduction ✍ ICT for regional cooperation and integration ✍ Promoting partnership
WSIS Phase I Africa Priorities (Bamako 2002)	✍ Infrastructure and maintenance of infrastructure and equipment ✍ Human resource development and capacity building ✍ Gender issues and women empowerment in ICTs uses ✍ Partnership between public and private sectors ✍ Debt conversion (to backup ICTs development) ✍ Environment protection ✍ Open and free software ✍ National information and communication strategies with special support to the African Information Society Initiative (AISI) ✍ Sectoral applications ✍ Support to NEPAD ✍ Digital Solidarity Fund ✍ Technology transfer, particularly South to South transfer ✍ Research and Development ✍ Investment strategies ✍ Content development ✍ Internet governance ✍ Relations between traditional media and new ICTs ✍ Legislative and regulatory framework ✍ Intellectual property rights ✍ Security ✍ Regional cooperation
WSIS Phase II – African Priorities Accra 2005	✍ Information Society and Regulation: Access and infrastructure ✍ Financing ICTs ✍ National and Regional e-strategies ✍ Open-Source Software and local languages/content ✍ Cyberlaw and Intellectual Property Rights ✍ Capacity building for policy-makers ✍ ICT applications in education, health, trade and governance ✍ ICT and Poverty Reduction ✍ Monitoring the Information Society ✍ Local governance ✍ Private Sector Development

Table 1: Overlapping Priorities of African Digital Agenda

[27] www.uneca.org/aisi

However, the change of orientation of bilateral and multilateral agencies during WSIS phase I towards mainstreaming ICTs into the Millennium Development Goals and their re-emphasis of the establishment of policy frameworks to encourage private investment in infrastructure has shifted the debate on African priorities to these issues. The deferred items of the first phase of the World Summit for Information Society namely Internet governance and the proposal for a Digital Solidarity Fund that was initiated by the President of Senegal became the key issues of preoccupation of African ICT experts and institutions during 2003/2004. Financing the information society was the key agenda of the Second African Preparatory Meeting for the Tunis phase of the World Summit for the Information Society that was held in February 2005 in Accra.

A key lesson is that Africa's ICT for development problem remain multifaceted and requires a mixed range of financing mechanisms and instruments spanning existing resources and new mechanisms. For example, there has been somewhat change of the tone from focusing on the Digital Solidarity Fund to pursuing domestic and international financial resources for building infrastructure projects proposed by NEPAD. The meeting in Accra called for "support of the Digital Solidarity Fund that would complement and not duplicate other funding of the information society," while the use of existing financing mechanisms should be "continued to fund the growth of new ICT infrastructure and services."

IV. Synthesis of issues and lessons that emerging from financing ICTs for African development over the last two decades

The discussion above demonstrates that ICTs investment in Africa so far originated from a mix of sources. Bilateral and multilateral agencies, the United Nations bodies and foundations played a key role in advancing the diffusion of ICT in the region and in fostering enabling environment for the participation of the private sector in the delivery of services. Private sector investment was instrumental mainly in the expansion of the cellular and Internet markets. Africa's mobile market has been the fastest growing of any region over the last five years. Private sector has also played a key role in promoting ICT awareness, supplying hardware and software, training and maintenance of ICT equipment. Multilateral companies are entering the field of ICT for development in Africa, although it is not clear whether the social agendas mix with corporate profit motives.

On the other hand, although the allocation Official Development Assistance to the ICT sector has been improving, the contribution remained very small. The lion share of the ODA is directed to emergency and relief and administration of programmes. [28] The spread of ODA around issues of food security, relief and terrorism means that the ICT sector funding will remain at the bottom of the priority list of the Development Assistance Cooperation. Furthermore, there is still scepticism about the role of ICTs in traditional development sectors funded by the ODA.

Likewise, the role of regional investment banks and local private sector has so far been limited. The African Development Bank (ADB) was not a key funding source for ICT projects in the region, although it has now begun considering the support of ICT

[28] Botchwey, Kwesi, Financing for Development Current Trends and Issues for the Future, www.globalpolicy.org/socecon/ffd/botchwey.htm

programmes particularly in expanding telecommunication networks by providing loans and encouraging private sector investment. The ADB has been working on regional plans particularly at the level of regional economic communities such as SADC, COMESA and ECOWAS. As a response to NEPAD ICT programme, it has carried out infrastructure needs assessment to understand the demand and investment requirements in the telecommunications sector. Other regional banks such as the West African Development Bank (BECAO) have not been keen in investing in the ICT sector.

Similarly there has been a growing consensus by International Financial institutions like the World Bank and multilateral donor agencies that investment in ICTs in Africa should largely be left to the private sector. Consequently there is a shift of the development assistance from financing information systems or infrastructure projects to the development of policies and plans, building the capacities of regulatory bodies and technical assistance for studying infrastructure needs, universal access, interconnection and tariff rebalancing. The World Bank, the main trend setter, has shifted from its traditional focus on privatisation, competition that emphasized fixed and mobile telephone networks, stopped traditional loans and credits to monopoly incumbents and moved on to extending access to wider range of ICTs through technical assistance with attention to encouraging private investment in infrastructure, broadening sector reform and institutional capacity building[29].

The mainstream position is that lack an enabling ICT policy and regulatory environment is the key obstacle to attract investment for ICTD. If developing countries create enabling policy environments, then they would be able to access finance for their ICT requirements[30]. However, experience suggests that market forces and liberalization alone cannot lead to universal access to infrastructure, meaningful use and social appropriation of ICTs by the majority of people. Market driven approach particularly privatisation has not resolved a significant access gap in Africa. In fact, the surge of private capital flows over the last decade and the expanding mobile sector investment did raise the hope that most of the financing needs for ICTs in Africa could be met by the normal working of the market. But, this did not happen for various reasons:

- Primarily the large flows was concentrated in handful countries such as South Africa, Tunisia, Egypt and Morocco where infrastructure has already well developed.

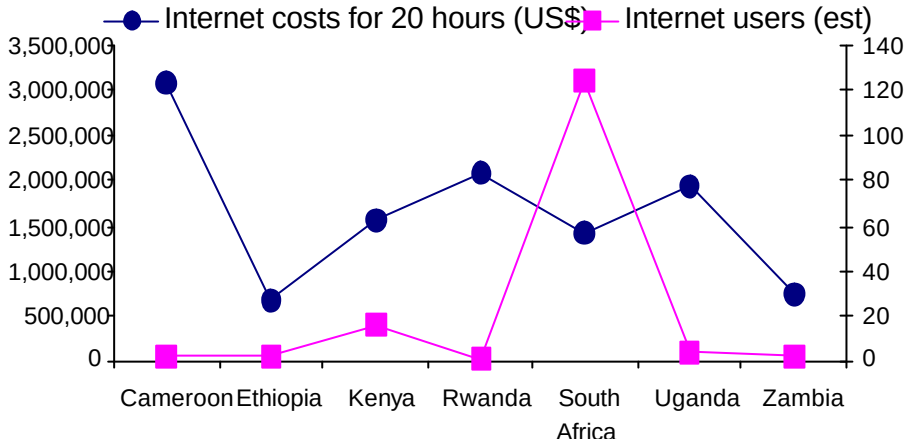
- Secondly, as demonstrated in Figure 1, studies conducted by a Research ICT Africa Network[31] show that privatisation did not lead to automatic increase of the number of users or bring the costs of Internet access down. The research ICT Africa network survey concludes that a number of factors including the disposable income that ordinary people allocate to the basket of communications and their needs should be taken into account when designing ICT intervention on a purely market basis. In most countries privatization preceded liberalization with periods of exclusivity to attract strategic equity partners. This often ended up in transferring public monopoly to private one- where the benefits to the consumers have been mixed. The independent regulation, which would have curbed the excesses of

[29] World Bank, Information and Communication Technologies, A world Bank Group Strategy, http://info.worldbank.org/ict/assets/docs/ExecSum.pdf
[30] Association for Progressive Communications, Financing ICTD in Africa, http://africa.rights.apc.org/index.shtml?apc=29740se_1&x=30657
[31] http://www.researchictafrica.net

private monopolies under such situations, has not been entirely effective due to over dependence on the government that had conflicting interests. Governments continued to be a major shareholder of telecommunications services and source of finance for regulators in most African countries.

- Thirdly, although competitive markets represent one of the alternative options to promote universal service, there are always a large segment of the population whose needs cannot be met by markets.

Internet users compared to Internet costs for 20 hours access (2002)



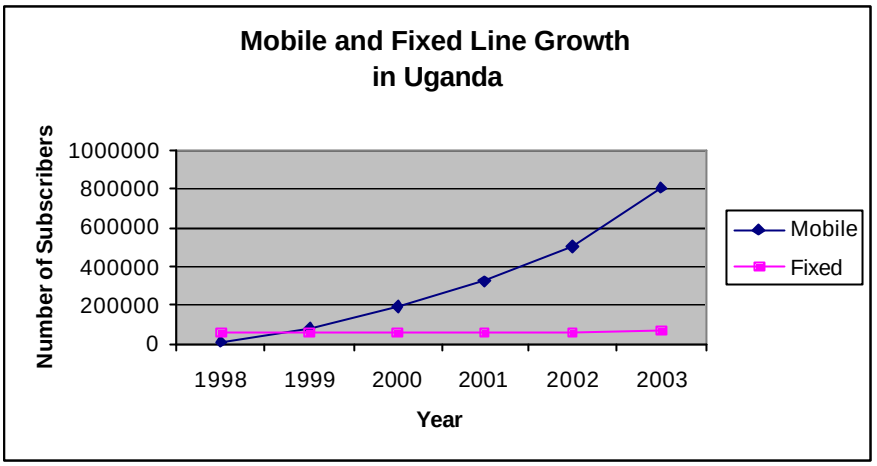
Source: ITU World Telecommunications Indicators 2003

- Fourthly, the appetite for private investment is drying out as lucrative markets in Africa are getting exhausted. The number of private investment in the ICT sector in Africa has declined over the last five years.

- Fifthly, private investment in infrastructure and liberalization did not lead to automatic extension of the most important technologies such as fixed lines, radios or televisions or reduce the cost of broadband connection that would have improved access to education, health and other livelihood contents for jobs and business opportunities. As demonstrated in figure 2, a survey by the Research ICT Africa shows that although a number of countries like Uganda that have liberalized the ICT sector achieved a high mobile phones penetration, access to fixed line remained stagnant or declined and broadband access costs remained high. Connection to broadband links such as the SAT3 submarine cables are tightly controlled by monopoly incumbents that put high price tags on it. This made access to broadband connectivity too expensive to the majority of institutions.

Another important lesson from the financing exercise in Africa is a constant shift of orientations of donor agencies that often leads to confusion by the civil society and the governments. Recently, this shift was towards mainstreaming ICTs for achieving the Millennium Development Goals and integrating them into the broader development and poverty reduction strategies. While this shift has been positive and pressing for sober assessment of the role of ICTs in poverty reduction and for increased adaptation of ICTs

to the needs, constraints and resources of African countries, there has not been associated financial commitments and good blue prints as to how to achieve these objectives.



Source: ITU, World Telecommunications Indicator Database, 2003

On the positive side, this focus on mainstreaming ICTs in development seems to have reduced excessive enthusiasm for ICTs[32] and raised a number of issues including the need for:

- Improving awareness and understanding of the possibilities that ICTs can offer in key development sectors like education, good governance, health and livelihood opportunities (especially agriculture and environment) in Africa

- Involving development agents and professionals in design of ICT programmes rather than relying only on mainstream ICT and telecommunication experts for devising e-strategies for key development sectors. So far most ICT projects in Africa are the results of discussion among ICT professionals and a relatively small group of ICT for development specialists and government ministries representing the ICT sector such as communication, information, science and technology. Evidently such projects failed to make a dent on development. (If possible, those who live in poverty must define their needs and the ICTs should be embedded in broader effort to improve their self-help.)

Other lessons and issues that have emerged from the ICT financing experience so far suggest that:

- **Comprehensive information on ICT financing would be useful:** There is a serious lack of systematic information on different financing mechanisms and funding sources on ICT for development. Part of the problem with ICT financing in Africa was lack information on what resources are available and where and when to apply for them. The ICTs for development community has been ineffectual in terms of making time and resources available for formulation of strategies to mobilise and manage resources, create financial bridge to the private sector, work with the Official Development Aid agencies and write winning funding proposals.

[32] OECD, Policy Brief: Integrating Information and Communication Technologies in Development Programmes, OECD Observer, November 2003

- **ICT should be seen as a long-term investment**: The focus so far has been on financing short (experimental) projects. This was exacerbated by miscalculation of the long-term sustainability of pilot initiative and the scarcity of long-term financing. Although experimental projects were useful, they are not well suited to longer term ICT growth in Africa. Experience of countries like India, Estonia, Brazil and Malaysia has already shown that the process of mainstreaming ICTs and building a competitive ICT sector takes decades rather than years. African ICT development programmes require long term financing.

- **ICT financing should focus on large-scale project:** ICT projects in Africa tended to be small with a difficulty to scale-up. The mostly pilot projects were unable to resolve the overwhelming need for connectivity, content and capacity in the region. ICT projects require large-scale thinking and planning from inception. Pilot projects should be conceptualised within a broader framework of their integration to a series of interconnected ICT programmes at national levels. Large-scale projects that help the civil society, government and private sector to seize opportunities are essential for poverty alleviation and economic growth in Africa.

- **Linkages between grassroots efforts and top-down policy reform and universal service initiatives could maximize the use of resources**: There has been significant disconnection between grassroots initiatives that aim to advance ICT applications at community levels and top-down approach by donor agencies, governments and regulatory bodies that aim to create favorable environment and bring universal access to the ICTs. A strong link between the top-down and the bottom-up approach is important in order to maximize the use of resources and integrate various initiatives.

- **Prioritisation of ICT projects could facilitate optimum use of scarce resources:** There has been an evident lack of prioritisation of ICT projects at national and regional levels due to inadequate analysis of needs, the involvement of specialists that often take sectoral view than a global picture and competing institutions that set priorities at local, national and regional levels from their own vantages points. Africa has seen a number of competing institutions for framework and priorities over the last decade. The proliferation of national e-strategies that touch every targets, every point, mention every sector and design every programme has exacerbated the problem of lack of priorities. Most e-strategies have a long shopping lists of ICT programmes that were not aligned with the core development priorities. This has not been helpful. Too many priorities meant little attention was devoted to implement a long list of ICT programmes by African institutions and governments. Regional and national ICT programmes should establish a big picture and make choices and priorities in key areas that have snowball effect on other sectors. Deeper and more rigorous analyses should proceed ICT prioritization for national development.

- **Collaboration among different actors could maximize the use of scarce resources:** The proliferation of competing priorities, studies and strategies in Africa points to the evident lack of collaboration among key national actors such as the ministries of communication, information, science and technology, ICT professional at local levels and their development counterparts, among donors and between regional institutions. This often leads to wastage of scarce resources and rethreading of same issues at major regional and national conferences. Insufficient

collaboration for learning and sharing information and resources among these players will continue to undermine ICT investment in Africa regardless of financing mechanism that is chosen.

- **ICTs financing should be anchored around the poor:** As consistently maintained above, providing access to the poor and marginalized remains the main challenge in Africa as those who have the ability to pay for Internet or cell phones could get hold of these when and where they are available. Experience shows that those who need information and knowledge are those at the periphery, the less educated, the poor and those who generally adopt innovation last. Evident shows that access to ICTs in Africa has slowed down over the last five years, as those who afford the services got connected. Access should move down to those at the next social and economic strata. However, these lack skills, knowledge, equipment, infrastructure, access, capital, electricity and roads to participate and to come closer to the global information systems. The poor access to contextual and meaningful information relevant to their livelihoods including information on local innovations. Local innovations and indigenous knowledge in new farming techniques, soil management, seasonal weather patterns, better healthcare practices are fundamental for poverty alleviation as much as a new scientific knowledge on farming technologies, fertilizers and seeds. Local content is far critical for the poor because the most valuable knowledge is often that is indigenous and adapted to local language, context, style and carried over from one part of the community to the other. It should also be noted access to ICTs does not always guarantee equitable distribution to members of a household or community particularly to the women. This implies that strategic interventions that promote pro-poor development should take gender aspects and the role of media and old technologies into account. Anchoring ICTs around the poor entails designing not only ICT appliances and applications relevant to the needs of the poor but also new financing and business models for provision of ICT access and services to the poor[33].

V. Financing ICTs in support of poverty reduction and for increasing economic growth in Africa

Financing ICTs with strong poverty bias calls for prioritisation of the needs and finding out the resource gaps in order to propose mechanisms to fill the gaps. Essentially, there is no shortage of forums, analytical tools, frameworks and studies to establish African ICT priorities. E-readiness assessments, national ICT surveys, in depth case studies and e-strategies, sub-regional initiatives and regional conferences and programmes have been trying to define African priorities.

At one point there has been proliferation of e-readiness studies that aimed at establishing the ICT gaps in Africa countries. Some countries were studied thoroughly. Algeria, Benin, Cameroon, Egypt, Madagascar, Morocco, Mauritius, Mozambique, Rwanda, Tunisia, Tanzania, Uganda and South Africa were among countries that were studied more than three times[34]. There has also been attempt to gauge the state of ICTs and gaps at regional level. The SADC e-readiness assessment was one of such studies that recommended for

[33] Kerry McNamara, Information and Communication Technologies, Poverty and Development: Learning from Experience – A background paper for the infoDev Annual Symposium, December 9-10 2003
[34] Bridges.org, E-readiness Assessment: Who is Doing What and Where, http://www.bridges.org/ereadiness/tables.html#B

"establishing better policy frameworks within which business and social programmes can thrive, build the necessary infrastructure and ground-level projects to spread the benefits of technology throughout society and provide a critical connection between policy considerations and the grassroots community needs."[35]

Although e-readiness assessments have been very useful in articulating key ICT infrastructure issues, providing a well-defined framework to structure inquiries about state of ICTs in Africa, they had limitations in terms of quality and depth particularly in addressing the complex problems of poverty, inequality and governance and other challenges outlined in the previous sections. Furthermore, the studies did not make explicit reference to national development priorities. The domain of their focus was ICT infrastructure, policy, usage and economy issues with strong bias towards liberalization and establishing enabling environment to attract private investment..

Efforts were also made to gather baseline data that provides a basis for establishing national priorities. Among these was the Scan-ICT[36] Africa project that was funded by the International Development Research and implemented by the Economic Commission for Africa. The aim of Scan-ICT was to build the capacity to collect and analyze ICT related data in order to improve decision making at all levels, monitor and evaluate ICT programmes and develop indicators that reflect African realities. The indicators were distributed along infrastructure, ICT policies, capacity development, sectoral application and the information economy. Countries that participated in the survey including Ethiopia, Ghana, Morocco, Mozambique, Senegal and Uganda have produced the first sets of data and baseline studies, although there was no follow up to such an important initiative particularly in sustaining data collection and analysis that would have informed better prioritization and decision-making.

In addition, African countries have seen a number of national and regional ICT status reports over the last ten years to support business cases and the development of national ICT strategies and policies. Among these are consultant studies that provided snapshots of ICT status in countries, sectoral reports that assessed policies and sectoral readiness, Internet and telecommunication diffusion surveys, telecommunications development reports that capitalize on the availability of the SAT3 submarine cable in West Africa and low cost VSAT technologies. The International Telecommunications Union is among the major institutions that produced useful in-depth country case studies on Internet diffusion in Botswana, Cape Verde, Egypt, Ethiopia, Mauritius, Morocco and Uganda[37]. These have been very helpful in providing insights into the ICT gaps in those countries and areas where resources should be spent.

More importantly, there were a number of regional ICT plans and projects by well established regional economic communities such as the Southern African Development Community (SADC), the Economic Community of West African States, the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of Central African States (CEMAC) and the East African Community (EAC) and the Inter-Governmental Authority on Development (IGAD) that seem to have more impact, although these are less publicized at regional and international levels. Regional economic communities have a significant potential for advancing the development of ICTs in their

[35] Bridges.org and World Economic Forum, SADC E-readiness assessment, http://www.bridges.org/e-policy/sadc_wef/index.html.
[36] http://www.uneca.org/aisi/activities.htm#3
[37] http://www.itu.int/ITU-D/ict/cs/

respective regions particularly in harmonization of policies and coordinating infrastructure projects. Financing mechanisms has yet to take note of the capacities of Regional Economic Communities.

The Southern African Development Community[38] is the most advanced of all of the regional economic communities when it comes to ICT related activities. SADC has created the Southern Africa Transport and Communications Commission (SATCC), which was funded by member States. In August 2001, the SADC Summit adopted a Declaration on Information and Communication Technology (ICT) and created a task force to transform the policy document into an Action Plan consisting of policy measures to transform SADC into an information-based economy. Other activities of SADC in the area of ICTs include:

- The adoption of a SADC Protocol on Education and Training that promotes the use of ICTs in curriculum development and teaching and learning.

- The Southern African Transport and Communications Commission (SATCC)' Model Regulatory Framework for Telecommunications that was issued in 1998 and which paved the way for enabling regulatory framework in the region. Of the 14 member states, 11 have operating policies and autonomous regulatory authorities.

- Creation of the Telecommunications Regulatory Association of Southern Africa (TRASA)[39] to promote regulatory harmonization in the region. TRASA developed a Model Telecommunications Bill within the spirit of the WTO Basic Reference paper on telecommunications regulation. It has issued guidelines on interconnection, tariffs and a frequency band plan for the 2.0MHz - 30.1GHZ band range. TRASA has also produced draft guidelines on universal access and services, licensing, fair competition and wholesale pricing. It has completed guidelines in the area of wireless and satellite regulation recently. The Association has also developed a partnership with NetTel@Africa; an e-learning platform for training regulators in various aspects of regulations ranging from ICT applications to spectrum management.

The establishment of the Southern African Telecommunications Association (SATA) that handles issues of technical standards, tariffs, SADC Regional Information Infrastructure (SRII) and cross-border investment in satellite and the creation of platforms for public/private partnerships are among other achievements of the Southern African Development Community.

The Common Market for Eastern and Southern Africa[40] is another regional group that invested substantially in ICTs development. COMESA undertook a study on interconnection and tariffs in 1998 that led to the establishment of a regional telecommunications network, known as COMTEL. COMTEL aims to facilitate increased trade relations within the region of eastern and southern Africa. Other COMESA ICT initiatives focused on building the capacities of its member states in harnessing ICTs for

[38] http://www.sadc.int
[39] http://www.trasa.org
[40] http://www.comesa.int

harmonizing and upgrading cross-border transport, customs, import/export and trade. COMESA provides technical assistance in several areas including customs data management, network connectivity and tariffs. More recently, COMESA has initiated programmes to harmonize ICT policies in the region as a basis for creating large markets to attract foreign investment. It has adopted a draft Model ICT policy, which drew heavily on the SADC experiences. COMESA has also established an Association of Regulators of Information and Communication in Central and Eastern Africa (ARICEA) to stimulate regulatory harmonization based on the experiences of the Telecommunications Regulators Association of Southern Africa (TRASA).

The Economic Community for Western Africa States (ECOWAS) [41] has also been a key player in ICT areas. ECOWAS has been working on the harmonization of sectoral policies in the region, and through a Consultative Regulatory Committee for Telecommunications it has carried out a study on harmonization of laws and regulations. ECOWAS has also established a West African Association of Regulators (WATRA) [42] that is actively engaged in promoting standardization and interconnectivity in West Africa.

The Economic Community for Central Africa States (CEMAC) [43] could become a key player of ICT growth in that region. CEMAC organized a workshop on ICT for regional integration in September 2002 where the governments in the region adopted a Declaration on the harmonization of the ICT sector, sharing of resources and the creation of an Association of Regulators for Central African countries.

IGAD[44] is another regional economic block that strives to promote the use of ICTs in the areas of peace, security and sustainable development. The original mandate of IGAD was to combat drought and desertification and to achieve food security in the horn of Africa. However, in 1996 this was expanded to include co-operation in political, economic and humanitarian affairs. The main focus of IGAD include policy harmonization with focus on trade and transport; assisting the horn of African countries to eliminate physical and non-physical barriers to trade; and promoting regional economic integration. IGAD aims to promote regional economic integration by implementing projects in transport, telecommunications, agriculture, energy and natural resources fields.

The East African Community[45] has programmes that promote connectivity between Kenya, Tanzania and Uganda. EAC has been working on a fibre network to connect Dar es Salaam, Kampala and Nairobi. Its regulatory harmonization initiative takes place through the Eastern African Regulators Postal and Telecommunications Organization (EARPTO).

Although these efforts are barely recognized, the regional Economic Communities proved to be more effective in building consensus on issues of policy harmonization and ICT infrastructure development in their respective geographic regions. Given the historical difficulties in attaining a regional consensus, the track records of sub-regional economic communities shows that they could be very effective in implementing cross-border ICT initiatives and forging consensus on financing mechanisms.

[41] http://www.ecowas.int
[42] http://www.watra.org
[43] http://193.251.137.10/
[44] http://www.igad.dj
[45] http://www.eachq.org

Africa has also seen regional priorities that have emerged from collective negotiation within the framework of the African Information Society Initiative and more recently through the NEPAD ICT agenda. The Economic Commission for Africa and the e-Africa commission are among the key players that have been shaping Africa-wide ICT priorities. The Economic Commission for Africa is implementing the African Information Society Initiative and actively involved in advocacy work on ICT for development, the formulation of for broad-based national ICT policies "NICI plans"[46], fostering partnerships among key players. The E-African Commission[47] oversees the development and execution of NEPAD's flagship ICT programmes. Current NEPAD flagship projects include an East African Submarine Cable (EASSy) that intends to create undersea fibre link between countries running from South Africa to Djibouti, a project to establish broadband fibre optics links from landlocked countries to submarine cable landing stations, an overlay satellite network and an e-Schools Initiative to connect African schools to the Internet. The e-Africa commission has also played a significant role in measuring infrastructure needs and rationalization of various infrastructure development initiatives in the region.

Despite these efforts, there have always been difficulties with securing regional consensus on ICT priorities in Africa due to the political, economic, cultural, linguistic diversities and institutional priorities. Moreover, there has been disconnection between advocacy at regional levels and the grassroots initiative at local levels. It is increasingly becoming clear that convergence between the ICT advocacy work by the Economic Commission for Africa, the NEPAD ICT initiatives and genuine grassroots efforts by civil society could increase the likelihood of success of ICT programmes that foster economic growth and support the poverty eradication efforts in the region.

At national levels, there has been a significant progress in formulating broad based ICT policies (e-strategies) master plans; some influenced by development agencies and others like that of Mauritius inspired by Asian countries like Singapore and India. Two thirds of African countries have now some form of broad-based ICT policies. Annex I provides a list of major national ICT policies. National e-strategies have been constructive in:

- raising the awareness of policy makers and the public on the importance of ICTs as an enabling tool for development
- prompting a conceptual shift from traditional policy making in telecommunications and broadcasting to an integrated framework covering infrastructure, applications and content (although the shift had a negative consequence of inattention to sectoral reform and Internet development issues), and
- transforming the concept of universal access from longstanding attention to phones to access to communications, information and knowledge through the Internet
- in certain cases prioritizing national ICT interventions

African national policies and strategies vary in quality and implementation considerably. For example, Mauritius has by far the most advanced ICT policy, less dependent on external assistance both in policy development and implementation of ICT programmes. Rwanda has one of the most elaborate ICT strategies developed through external assistance with genuine commitment from the government. However, most of the ICT strategies remain too ambitious and not consistent with the reality, infrastructure, resources and

[46] http://www.uneca.org/aisi/nici
[47] http://www.eafricacommission.org

capacity of institutions to implement them. The spread of e-strategies around many issues also led to lack of focus on core issues such as Internet development and competition in the telecommunication sector.

It has become clear that locally owned, and organically developed ICT policies and strategies could provide a useful framework for connecting ICTs with national development goals. Despite growing enthusiasm for e-strategies, the building blocks such as genuine commitment of policy makers, financial and human resources are absent in most countries. Lack of technical and policy capacity means that countries typically rely on external experts to identify ICT programmes on their behalf. Experience of Egypt, Mauritius, Morocco, Senegal, South Africa and Tunisia shows that developing ICT policies in a more organic fashion by relying on local expertise and focusing on building blocks like Internet/telecommunications policies and human resources development could lead to better results than ambitious lists of programmes. More importantly, the implementation of these policies and master plans require leaders and champions with vision and actions to make things happen. Positively, Africa has a large number of enthusiastic people who strive to make things happen but seem to be constrained by entrenched bureaucracy and red tape. Recent reviews suggest that invigorating these leaders could actually lead to better implementation of ICT projects in Africa.

Nevertheless, there has been improvement in the quality and content of the e-strategies over the last two years. Some are putting concrete implementation plans and financing mechanisms forward. For example, Djibouti's National ICT Strategy[48] and its accompanying Action Plan that was developed in 2003 has proposed budget of US$13.7 million over seven years to improve the ICT infrastructure, put a legal framework and a national ICT agency in place and modernize the telecommunications sector. The more the e-strategies mainstream ICTs as instrument to national development and poverty reduction strategies and designed in an organic fashion taking the social and technological capabilities of countries into account the better their success and for attracting local and international financing[49].

Otherwise, integrating ICTs in poverty reduction strategies provides a very useful and more logical starting point for subordinating them to development goals. However, despite interest in the ICTs and poverty, most poverty reduction strategies have difficulties in linking them to their goals. African countries vary in their progress in achieving poverty reduction goals and in priorities they attach to ICTs. Out of sixty-four national development plans analysed by the Organization for Economic Cooperation and Development (OECD), the vast majority make only some mention of ICTs as an element of national development. The OECD study also showed that of twenty-nine Poverty Reduction Strategy Papers they surveyed those of Cameroon Chad, Gambia, Ghana, Mali, Mozambique, Niger, Rwanda have some strategic interest in ICTs on poverty reduction. This does not only show the consistent tension between ICT professionals having difficulties to understand the underlying development challenges and development professionals' struggle with identifying the potential of ICTs in poverty eradication but also points to the need for cooperation between the two groups to map out the full range of economic and social challenges, articulate their information, communication and knowledge dimensions and identify ways in which ICTs address these challenges[50].

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[48] Djibouti ICT Action Plan, 2003, http://www.mccpt.dj/Documents/Action%20plan-djibouti.pdf

[49] Mansell, Robin and Uta When, (1997), Eds. Knowledge Societies: Information Technology for Sustainable Development. Oxford University Press

[50] OECD, Policy Brief, ibid

As local ownership of the design and implementation of ICT programmes improves particularly as the participation development professionals, civil society and private sector increases, African ICT priorities will move away from a purely technology-centred strategies identified by ICT experts and from stand alone-pieces of projects towards those adapted to the needs and circumstances of resources and constraints of the countries. If ICTs are to become a means for improved economic condition of the poor, financing mechanisms should address the need of the poor, women, margnianlized groups such as people with disabilities and make sure that policies and strategies at macro and international levels initiatives are supportive to the micro and meso level initiatives.

A recurrent theme that has been emerging from experience and the analysis of national e-strategies and position papers is that ICT financing mechanisms in Africa should concentrate on five major areas:

- Promoting access to and empowering the vast majority of African poor
- Facilitating the diffusion of modern and interactive ICTs by building both backbone and distribution infrastructure
- Investing in human capacity to foster innovation and entrepreneurship so as to increase usage and to develop applications that solve development problems and increase economic growth
- Mainstreaming ICTs in key sectors of development
- Supporting initiatives that promote enabling policy and regulatory environments

Promoting access to and empowering the vast majority of the african poor

If poverty is the target and the concern is about bridging the digital divide, promoting access to and empowering the vast majority of the African poor deserves more focus. However, the mainstream ICT for development debate has not made concrete proposals as to how to address the information and communications needs of the poor of which 50 to 80% live in rural areas. These are often illiterate and speak one or a few local languages with different dialects. Women represent half of the poor

There is no doubt that ICTs provide a potentially enabling environment for alleviation of the condition of the poor. It is apparent that ICTs cannot deliver anything by their own and the poor does not have time, knowledge and resources to apply information and communication technologies. However, the poor makes decisions about seeds, soil, family size, education of children, etc; and economic and social benefits come in the form of improved decision-making of all kinds throughout the society[51]. Increased generation and use of information and its effective communication contributes greatly to the decision poor people make and for making their voices heard. Improving or altering the "density," the structure and distribution of information could greatly contribute to the expansion of the stock of knowledge that the society depends on. ICTs facilitate the spread and "distribution" of knowledge throughout society and rapid generation new knowledge.

The distribution of potentially empowering information could make a dent on the conditions of the poor in Africa. African countries whose knowledge flow and communication is difficult and intentionally constrained tend to be low-growth. These are

[51] William Melody, Policy Implications of the New Information Economy, http://lirne.net/2003/about/papers/ToolBook-NIE.pdf

not only caught in poverty traps, disease, environmental degradation and corrupt government institutions but also place high toll on flow of information. Governments in poor countries are poorly placed for systematically disseminating information to the public and sometime lack transparency due to high level of corruption. Corruption thrives within a complex information asymmetry and poverty exacerbates the cycle. Poverty is a double-evil, it places restriction on access to information that is critical to eradicate it.

Therefore the spotlight on ICT for the poor should not concern itself with the technology per se but rather on communication, information transfer and sharing of knowledge. It should not focus only on affordable access to information that is vital to their livelihoods but also on widening their opportunities, giving them more voice and improving their capacity to use potentially empowering information. It should address rights and empowerment, improvement of transparency and equitable distribution or allocation of resources.

If poverty is the target, focus should be made on expanding access both to rural areas and deprived people in urban areas. Identifying the information needs of the majority of the poor should therefore be the starting point for ICT interventions. This makes old technologies such as radio that convey information less expensively in local languages to large number of people more appropriate. The quest for making information to majority dictates the focus on old technologies such as radio, television and telephones integrated to Internet and advanced communication services at the community levels. Access to accurate information through trusted sources like radio has a positive impact on the livelihoods of households and entrepreneurs and farmers. Free flow of market information reduces transaction costs, cut down middlemen that often benefit from the information asymmetries of the poor.

This bias towards the poor and old technology raises a number of issues including the need for pro-poor radio programming, development and implementation of pro-poor broadcasting policies, building the capacities of independent media to integrate new technologies into the old technologies in order to increase access and adapt globally/locally available information to the needs of the poor.

Phones should be next on the list of ICTs for the poor. Studies conducted by the Research ICT Africa and DFID show that the African poor travels a great distance to make regular telephone calls to towns and abroad, often to solicit the transfer of remittances from a member of the family. However, despite plummeting costs and advances in wireless technologies, investors and financial institutions are generally reluctant to get involved in rural telecommunications in Africa. A wide variety of universal service options ranging from the popular reverse auction (where bidding firms compete for subsidies of the fund based on the lowest subsidy requested or greater investment commitment to provide services in designated area) to rural cooperatives should be explored to expand telephone access to rural areas. Universal access should also be linked to wider access to new information and communication technologies and public services and information.

Moreover, pro-poor intervention should combine radio, TV and telephones with community based bottom-up interactive services built around emerging technologies such as Wireless Fidelity driven by open source software running protocols such as VOIP that makes affordable telephone calls possible.

Raising access to radios to 100% , television to 25%, phones in rural areas to 10% is required to promote meaningful information and communications in support of Millennium Development Goals over the next ten years. Additional work is required in promoting universal service and encourages policies that support experimentation with new bottom-up wireless technologies to build ad-hoc community networks that could be integrated to broadcasting media. More over empowerment of the poor through ICTs demands:

- Establishment and implementation of pro-poor broadcasting policies
- Strengthening the capacities of civil society, researchers and independent media to participate in pro-poor programming and the debates that encourage diversity, pluralism, freedom of expression and genuine inclusion of the poor.
- Building the capacities of broadcasters and intermediaries to integrate new technologies to old ones in order to improve access to information for the poor, vulnerable and socially excluded on issues that affect their livelihoods
- Promote the gathering and disseminating of indigenous knowledge and local innovations that have direct impact on the poor

Table 2 lists some of the major areas of pro-poor ICT related intervention in Africa and associated ballpark cost figures[52].

Area of Intervention	Specific Interventions	Ballpark figures in Millions
Infrastructure:	Raising access to radio to 100%	250[53]
	Rising access to television to 25% of households	200[54]
	Raising access to phones to at least to 10%	1000[55]
	Bottom-up community ad hoc networks integrated to broadcasting	100[56]
	Support for demand-driven locally run community radios	125[57]
Policy	Support for development and implementation of pro-poor broadcasting policies and advocacy on pro-poor media policies, pluralism, freedom of expression	25
Capacity	Capacity building for	10

[52] Of course, these kinds of estimates are frequently the subject of intense debate, especially given the interaction between access, infrastructure, policy, capacity and content. They nevertheless help to shed important light on magnitudes of resources required to bring impact on poverty eradication and economic growth.

[53] 100 million receivers with costs about $5, the poor could contributes half of the costs

[54] 80 million TV sets at $100 each, half of the cost met by the poor

[55] 5 million Internet ready fixed / fixed wireless lines built through reverse auction

[56] 10,000 ad hoc community networks at US$10,000 each

[57] 5000 community radios each costing US$25,000 to set up and run for 2.5 years before they are sustained. community radio transmission system cost $1000, digital sound recording equipment for $1000, running cost relatively high.

	broadcasters and intermediaries pro-poor programming and integration of new technologies Promotion of gathering and dissemination of indigenous knowledge and local innovations	 15

It is estimated that about US$1.725 billion is required to bring a reasonable access to information and communication by the African poor over the next ten years of which a half could be available from traditional private sector, donor agencies and public funds. A shortfall of about a third of that $ 575 million should be available through other mechanisms over the next ten years.

However, expanding access to radios and telephones should not be seen as the panacea to overcoming poverty. Impacts depends on sets of other inter-related factors ranging from infrastructure, applications, strong commitment to education, capacity building to enabling polices.

Building backbone and distribution infrastructure

The growing convergence between voice and data and increasing need for multimedia-intensive applications for health, education and other sectors makes broadband connectivity a pre-requisite for establishing the information society and improving the conditions of the poor in Africa. However, access to backbone infrastructure is limited in Africa. The continent has the lowest international bandwidth per capita. In addition, the per kilobyte/month cost is exceedingly high compared to developed countries and this is often passed to users. A 2 Mbps satellite connection in West Africa costs 18 times of the price in the United States and a similar fiber capacity costs as many as 32 times of that of the prices in the US[58].

This is exacerbated by over reliance on satellite backhaul connection, lack of competition and accountability in service delivery, weak policy and regulatory frameworks, ownership of fiber links by monopoly incumbents and inadequate diffusion of the infrastructure to rural areas. Most available infrastructure is concentrated in urban areas. In some countries 60 to 70 percent of the switching capacity is concentrated in the capital. Broadband penetration is concentrated mainly in urban areas and the use of it is limited to international institutions, wealthy residential markets, cyber cafés and a few small and medium enterprises. Besides, there is limited inter-country and inter-regional connectivity. It is often difficult to connect between two neighbouring countries.

Regional connectivity is limited and concentrated in at the bottom tip and west (Southern Africa and West Africa). However, there are some initiatives by power and railway companies that are beginning to rollout fibre trunk lines attached to their networks. For example there is sub-regional optical fibre cable projects laid along the power network of

[58] Spintrack, Technical Manual for Investors: Bandwidth Capacity distribution ventures, November 2003, http://www.spintrack.com/itadvice/reports/Spintrack_Technical_CDE.pdf

Manantali dam linking Mali, Mauritania and Senegal. The South African power company ESCOM has also a similar plan to connect southern African countries. The Regional African Satellite Communication (RASCOM) has also plans to launch a satellite to meet the growing regional connectivity needs.

International connectivity in Africa is mainly provided by satellite although fibre optics is gaining grounds where it is available. The South Africa Far East cables, West African Submarine Cable (SAT3), Atlantis II are the key cables providing fibre connectivity. Djibouti is connected to the SEA-ME-WE cable that runs from East Asia to Western Europe. The SAT3 provides most of the connectivity and has links to Angola, Benin, Cameroon, Cote D'Ivoire, Gabon, Ghana, Nigeria, Senegal and South Africa. Nine countries including Congo-Brazzaville, Equatorial Guinea, Gambia, Guinea, Liberia, Mauritania, Namibia, Sierra Leone and Togo are not connected to it. Altogether 28 African countries have no direct connection to International fiber links of which the majority are in East Africa and West Africa.[59]

An ICT Infrastructure Investment Options study by the Department of International Development (DFID) estimates that an investment up to US$1 billion is required to connect countries that have not yet been connected to fibre optics particularly the Indian Ocean bordering eastern and southern African countries stretching from Mozambique to Djibouti and to provide links to west African countries that have not connected to the SAT3 cable and complete various proposed infrastructure intra-regional projects such as the South African Regional Infrastructure Initiative (SRII) and the COMTEL project proposed by the Common Market for Eastern and Southern Africa. Table 3 provides a list of major broadband regional and international broadband infrastructure projects that are currently underway.

Table 3: Major broadband infrastructure projects and proposals

Project	Countries	Progress
Intelcom II	Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leon, Togo	Underway
SADC Regional Information Infrastructure (I-III)	Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia Swaziland, Tanzania, Zambia, Zimbabwe	Underway
Chad- Cameroon Pipeline project	Cameroon and Chad	Underway
COMTEL	COMESA countries –Angola, Burundi, COMOROS, DRC, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe	Not started
EASSy, East African Submarine Cable	South Africa, Madagascar, Tanzania, Kenya, Djibouti, Seychelles	Not started

[59] DFID, African ICT Infrastructure Investment Options, http://www.afridigital.net/downloads/DFIDinfrastructurerep.pdf

NEPAD ICT/1	West Africa	Under plan
East African Digital Transmission Project	Kenya, Uganda and Tanzania	Uganda and Kenya have completed, Tanzania has yet to build
Central African Digital Transmission link	Cameroon, Chad and Nigeria	Not completed

Source: DFID, African ICT Infrastructure Investment Options Study

In addition to the above projects there is a need for:

- Establishing Internet exchange points to keep local and regional traffic local. Internet exchange points are important because 7-10% international traffic goes between Africa and about 2 to 4% of the email traffic is local.
- Putting the right regulatory and policy framework to facilitate private investment in infrastructure and innovation in new technologies
- Rolling out a variety of broadband distribution networks including DSL, cable modem, terrestrial broadband networks to extend access further from traffic concentration centres and expanding backbone access to rural areas using a mix of wire-line and wireless technologies.
- Building backbone infrastructure for broadcasting and signal distribution

There is no doubt that the bulk of the African infrastructure gap could be met through private sector investment. However, there are always high-cost low-income potential user areas where private funding is not attractive. Besides, there are other infrastructures and service related factors that influence the use of backbone infrastructure. These among others include availability of electric grid, transportation means and security. It is estimated that a short fall of about US$1 billion dollars should be raised through innovative mechanisms to bridge the infrastructure gap in the region including supportive infrastructure such as rural electric grids.

Mainstreaming ICTs in key sectors to facilitate wider access to services

The provision of backbone infrastructure is a key step, but access to affordable bandwidth and empowerment of the poor will not be complete without a significant investment on applications and ICT programmes in key sectors such as health, education, agriculture, environment and public services. The aim of mainstreaming is to promote the achievement of sectoral development goals rather than goals defined in terms of distribution of and access to telephones and the Internet.[60] Mainstreaming of ICTs in key development sectors could be achieved by systematically integrating them at the project levels or at the development plan levels. For example, key sectors like education could identify the information and communication dimensions of the delivery of their programmes at national, regional and local levels and the integrate ICTs at each levels.

Analysis shows that education, enterprise development and public services receive more attention compared to mainstreaming ICTs in the health and agriculture sectors in Africa.

[60] OECD Development Assistance Committee – Donor ICT Strategies Matrix – 2003 Edition, December 2003

This is unfortunate because the agriculture sector employs the majority of the population while the health sector absorbs the majority of government budget. These sectors deserve more attention. Mainstreaming ICTs in key development sectors in Africa would involve:

- **Empowering development professionals so that they align ICTs to their day-to-day challenges** - Benefiting from ICTs requires learning, training, affordable access and user support environments. This implies that development professionals such as agricultural extension workers, nurses and teachers should be trained on the capabilities and limitation of ICTs and how ICTs can be applied to improve individual and community' social and economic benefits. The skills should also include information seeking and use and content development and dissemination.

- **Providing the necessary tools for development professionals** - Meaningful and productive use of ICTs requires computers, software and applications in local languages and suitable tools to create and disseminate content. This necessitates increased connectivity at work places and at public outlets such as libraries, clinics, schools and focus on providing access to useful applications such as online education materials, health and public service forms, etc to those who cannot afford access at home, workplace or cyber cafés.

- **Imparting high-level knowledge on long-term goals of ICTs for development** – At a higher level mainstreaming of ICTs requires the capacity to "think big" and the ability to integrate, streamline and prioritise ICT programmes in major sectors. Experience of African countries that have made headway such as Mauritius shows that the "big picture" thinking capacity should be available locally; it should not be left to international consultants.

- **Increasing capacities for implementing programmes:** the ability to absorb resources and implement programmes is critical for successful mainstreaming of ICTs in development. As much as countries lack the ability to see the "big picture", they have difficulty in absorbing additional resources. The expansion of donor activity into ICT for development and the trend towards mainstreaming of ICTs mainly in the traditional development sectors have put considerable pressure on scarce skills in many countries. Both specialized ICT skills and more generic planning, project management and implementation skills need to be built.

- **Fostering entrepreneurship to facilitate the development of applications in key sectors:** There has been sufficient innovations in ICT for development but these were unable to scale up and solve the wider development challenges facing the poor in Africa. Countries need broad-based research and development capacity to understand the social implication of information and communication technologies and to develop applications and content suitable to local contexts and languages.

It is difficult to put a price tag on mainstreaming ICTs in key sector in Africa. However, it is possible to put a ballpark estimate as a percentage of external development financing requirements or based on estimates made in national e-strategies. At the current absorptive capacity, African countries need between $3 to 15 million dollars a year each to mainstream ICTs in key development sectors.

Human capacity development

Although mainstreaming ICTs in key sector contributes to the development of ICTs skills at work place, concerted effort is required to educate and train young people and university cohorts in Africa. Skilled people are the engine of information society. Unfortunately, despite significant growth in the number of people that have gained ICT skills mainly through the efforts of private sector, the quality and quantity is not adequate to drive the information society in the region. The brain drain is another significant problem in the ICT sector, as the most skilled move regularly. Brain drain is not entirely a negative trend, but should be supplemented with training of a critical mass of highly skilled network engineers, applications developers, analysts, project managers and large-scale programme implementers.

Developing skilled people involves a set of interrelated tasks such as:

- Promoting ICTs education in schools and colleges,
- Improving literacy and numeracy including information seeking skills,
- Building stronger scientific, mathematical and engineering education
- Improving ICT professionalism and increasing professional education and standards,
- Fostering research, innovation and entrepreneurship of a higher calibre so as to support the development of applications to solve local problems. This is an important area since smart software and applications developers and those who produce interactive digital content are in short supply in Africa.
- Building advanced ICT infrastructure to enable researchers to share access to research resources including equipment
- Creating incubation centres that enable entrepreneurs to translate ideas into projects and businesses

Investment in human capital in Africa demands a good research infrastructure, new approaches to teacher training, research-based learning and expansion of educational content. In addition, public policies on taxation, competition, health, immigration are also important to attract and retain bright people that drive the information society.

There is no systematic analysis of the costs of building skilled human resources in the ICT sector in Africa. Experience of recently established advanced ICT graduate schools indicates injection of up to US$500,000 is useful to take them off the ground. It is estimated that a cost per student for IT classroom excluding training, housing and recurrent cost is about $141[61]. These figures indicate that building skilled human resource remains the most expensive endeavour. The traditional public funding should be augmented with innovative financing to strengthen research and education in the ICT field and build open content that facilitates teaching and learning in Africa.

Policy and regulatory environment

It is now well established that ICT interventions at the micro and meso levels, infrastructure development and human capacity building cannot succeed without a broad

[61] Kenny, Charles, Juan Navas-Sabater, Christine Z. Qiang (2001) "Information and Communication Technologies and Poverty in the World Bank" (Ed) Poverty Reduction Strategy Sourcebook, Washington DC: World Bank. http://www.worldbank.org/poverty/strategies/chapters/ict/ict.htm

policy support. African countries have seen a significant external support in the ICT policy front particularly in defining broad-based ICT policies and liberalization of the telecom sector; however, there is still a significant gap between what new and old information and communication technologies can deliver and what the policies promote. There is also an evident lack of technical capacities particularly in the emerging areas such as electronic commerce, Intellectual Property Rights, network security, the development of IP networks and wireless technologies. Coupled with lack of integration between different policies, the regulatory environment in most countries remained weak and unable to promote competition and well crafted universal access strategies.

Following the end of exclusivity period of traditional incumbent telecoms, many African countries have embarked on telecommunication sector policy reviews. These reviews provide ample opportunities for revising the policy and regulatory frameworks to promote multi-layer competition and to define and implement reliable universal service strategies. Building the capacity of regulators is important to enrich legal and regulatory mechanisms, promote competition and fair interconnection and to enable them to design universal access strategies that balance between private sector incentive and public access requirements.

Similarly, the recent focus on mainstreaming ICTs into Millennium Development Goals and poverty reduction strategies has opened up opportunities for revisiting traditional ICT strategies and NICI plans. This would allow development professionals to define strategies that integrate ICTs appropriately in the development and enable countries to move away from e-strategies that focused on infrastructure and sectoral projects to those that take the needs and capacities of countries and stakeholder and the potential of old and new technologies into account. This would also create opportunities for integration traditionally separate ICT telecommunications and sectoral policies.

Regional harmonization of policies and improving African countries' participation in global ICT regimes remains an important activity in Africa, as these will continue to affect local progress. Capacity building should not simply end at providing support for attending regional and international conferences, but rather enable them to analyse issues and positions and contribute to the debate and if possible sway decisions to the benefit of the African people.

Since policy advice is the top priority of development agencies, it is expected that there will not be shortage of financial resources in this "hot" area, except policy development requires serious research and analysis of the issues. This seems to be missing in Africa except for the effort of networks such as Research ICT Africa that aim to build the capacity for independent ICT policy and regulatory research and analysis. African countries need a significant amount of resources to build national capacity for ICT policy training and research.

VI. ICT financing in Africa within digital solidarity agenda and global public goods framework

Empowering the poor through increased access to information and making their voices heard, building human resources capacity, mainstreaming ICTs in key sectors, building backhaul and distribution infrastructure requires a significant amount of resources that cannot be met fully through traditional public, private and donor financing. Domestic resources are historically strained. African governments are not only confronted with

competing priorities but also lack the requisite resources to commit to implement their national ICT strategies or rollout capital-intensive broadband infrastructure even when the benefits are increasingly becoming apparent. The international and regional financial institutions such as the IMF, the World Bank and the African Development Bank have a strong bias towards supporting the private sector initiatives. While private sector investment is important, it will be inadequate to meet the needs of the vast majority of poor people.

There has been a significant reorientation of the United Nations agencies to policy advice and development of regulatory environments and e-strategies in Africa. Even when available, these funds were miniscule compared to the scope of needs in Africa. The ODA may provide part of the ICT financing but the scepticism about the implication of ICTs, its stretch by emerging issues like relief and the transaction costs in securing bilateral resources makes it less forthcoming. Moreover, there is an insufficient domestic resource in Africa. The majority of the private enterprises are multinational and the local entrepreneurs remain small to make any significant contribution.

Improving the policy and regulatory environment could facilitate further attraction of investment and use of already existing financial resources. However there is always a short fall to meet requirements beyond the borders of the market. Based on the ballpark estimates above, African countries need at least US$600-900 million dollars of additional financing well beyond that is available from public, private and development finances to make a dent on the information and communication capacities needed to achieve the Millennium Development Goals. These resources should be available within the digital solidarity agenda specifically within the perspective of global public goods. The public good framework represents a creative instrument for mobilization and channelling long-term development finance to African countries.

The idea of digital solidarity with Africa has already gaining roots in Africa through the announcement of the Digital Solidarity Fund by President Abdoulaye Wade of Senegal. Although there is no consensus as to what the Digital Solidarity Fund will do, the announcement by President Wade has created a significant interest in innovative financing mechanisms around the world. The United Nations Task Force on Financing Mechanism that was set up to investigate among others the viability of the Digital Solidarity Fund has paid a little attention to it and recommended for "increasing the effectiveness of existing ICTD financing mechanisms and to raise additional resources through reaching out to new constituencies and/or more effectively leverage resources through putting in place a variety of cooperation and coordination mechanisms."[62]

In February 2003 at the Preparatory Conference for the first phase of the World Summit for Information Society (Prepcom 2) President Abdoulaye Wade introduced the need for transfer of resources from developed countries in north and south to developing countries particularly to Africa within the framework of digital solidarity with the south. The Fund aims to support the development of infrastructure, human resources and applications particularly projects that focus on "community development, cultural diversity and local content, targeting women organisations and using micro-credit strategies, such projects seek to address insolvent demand, with a view of creating new businesses and, in the long

[62] Task Force on Financing Mechanisms, The Report of the Task Force on Financial Mechanisms for ICT for Financing ICTD: A review of trends and an analysis of gaps and promising practices, December 22, 2004, http://www.itu.int/wsis/tffm/final-report-executive-summary.doc

term, new markets." The Fund, which was established as a legal foundation in Geneva, has secured contributions from cities and local authorities. It has raised over 5 Million Euros and aims to collect more through levies on ICT company contracts procured by participating government entities. As municipalities represent the largest contingent of DSF members, emphasis has been placed upon collaborative relationships and consultations in ICT applications among municipal governments in developed and developing countries.

While the enthusiasm for the Digital Solidarity Fund was high particularly at the level of key African organizations and some countries, there is growing uncertainty about the underlying priorities (e.g. whether there is some analysis where the resource should go in the first place), governance, management, administration and strategies for disbursement of the Digital Solidarity Funds. The division between those promoting the Digital Solidarity Fund and others who encourage use of existing mechanisms and other innovate mechanisms has been apparent in Africa as demonstrated by the resolution of the African Preparatory Conference for the second phase of the World Summit for the Information Society. The meeting called for both the "support of the Digital Solidarity Fund that would complement and not duplicate other funding of the information society," and the use of existing financing "to fund the growth of new ICT infrastructure and services." There is a growing concern within the donors community about the risk of diverting resources to ICT4D from more proven areas of development intervention and the desirability of establishing another independent sectoral institution to manage interventions aimed primarily at mainstream development goals[63].

Moreover, as one member of the African Information Society Initiative mailing lists observed, the DSF may not be able to secure sufficient funds to meet the overwhelming needs. There are concerns that DSF may be subject to fragmentation into projects that will not be sustainable. "The problem always is that with pent-up needs, everybody wants a piece of the action and yet there is never enough to go around", he observes. Moreover, the political nature of the DSF seems to perpetuate longstanding "charity-based" economic ecosystem where governments are linked to natural resources and foreign aid. There are already calls from the civil society for matching domestic resources by governments and private sector and that African countries should become the true partners of the DSF than recipients. Nevertheless, there is feeling that the DSF be given a chance to prove it self especially in exploiting its strong alliance with local governments.

Consequently, there is a growing consensus that as much as African countries should heed to the creation and contribution to the Digital Solidarity fund, they should participate in the global debate of strengthening the effectiveness of existing financial mechanisms and the creation of new ones. African countries should be part of the strategies and debates for increasing access to resources available from traditional funding sources, trade and debt relief and more significantly those that should be available within the Global Public Goods frameworks.

The public goods approach has become an important and an alternative framework for justification for financing mechanisms that go beyond what the market supplies. The public goods framework Posits that[64]:

[63] David Souter, (2004), African Participation in WSIS: review and discussion paper, Prepared for the Association for Progressive Communication (APC), http://rights.apc.org/documents/governance.pdf
[64] Association for Progressive Communication, Financing ICTD in Africa, http://africa.rights.apc.org/index.shtml?apc=29740se_1&x=30657

> "Extending access to the Information Society in developing countries is a global public good that benefits everyone because of the value of network externalities. The value of the global information network increases in value as more national networks and business and individual users are added. Since the global economy runs on global information networks to create a global marketplace, the private sector in developed countries stands to benefit from the extension of ICTs in developing countries and should help pay for ICT for development as a global public good. Therefore, a Global ICT Fund should be established, similar to the Global Environmental Facility, which could raise funds through a global tax on microchips, for example. The proceeds of the Global Fund would be directed towards building information societies and economies in developing countries."

Access to ICTs and knowledge in Africa meets these main characteristics of trans-national public goods. Universal access to ICTs "can be considered as a global public good in that it is theoretically and practically both non-rival [one person's consumption of the good does not diminish the amount available to others] and non-exclusive [no one should can be excluded from access)][65]. Moreover, access to ICTs and networks makes the delivery of a wide-range of services that in turn enhance other public goods. Likewise, access to ICTs and knowledge by the African poor is important to the international community, to both developed and developing countries. The overwhelming financial burden for bridging the digital divide will not be adequately addressed by individual African countries or entities acting alone, and best addressed collectively on a multilateral basis.

Access and empowerment of the poor thereby reduction of poverty will directly contribute to the well-being of others, through reduced conflict and decline in communicable disease and environmental damage in Africa. In effect, no place deserves more attention than sub-Saharan Africa when it comes to public good. Of course the asymmetric benefit between African countries and developed countries could lead to resistance from developed countries to the concept financing ICTs as public goods particularly the proposal for the application of "microchip" tax at the manufacturers end.

It is perfectly appropriate for the developed countries to participate in the public goods debate and financing specifically those relevant to Africa. Developed countries could benefit from empowerment of the poor as much as from the traditional approach for creating policies and regulation. The network externality from close to 800 million empowered people that do not have access so far could open up opportunities for investments and reduce conflicts. Moreover, the global public good framework encourages the principle of subsidiarity, which may improve the capacity of governments to address policy and regulations squarely.

The Global Public Good framework provides an alternative mode to existing funding mechanisms for Africa. It provides an alternative framework for financing universal access on long term basis.

[65] Pablo Accuosto and Niki Johnson (2004) Financing the Information Society in the South: A Global Public Goods Perspective http://rights.apc.org/documents/financing.pdf

VII. Conclusion

African countries will benefit from a well-intentioned and crafted dual financing mechanism that promotes further the mobilization and use of existing domestic and international resources and private financing and new innovative financing within the framework of the digital solidarity agenda specifically within global public goods framework. A significant effort is still needed to improve domestic financial management and creating enabling environment to attract investment and optimise use of exiting resources.

Innovative financing mechanisms should also be pursued to bring universal access to the poor. The proposed global tax on trans-national companies would not only facilitate the generation of $600 to $900 million required to advance access to the poor, to mainstream ICTs in key sector and enable countries to build human resources and opening up avenues for entrepreneurship and innovations but also improves the value of network externalities to all. Tax at the manufacturer end would also end the fear by some countries of the risk of diverting resources particularly the ODA from financing traditional sectors and priorities such as the reduction of the burden of HIV/AIDS.

The global public good framework also creates a new incentive for active participation of African countries in international financing negotiation that has enormous impact on the well being of the majority of the population. Although the modalities for collection and management of public good "tax" needs to be developed, African countries could play a key role in multilateral programmes for transferring of resources from global public good to actual projects and identifying targets that need access the most. Furthermore, the global public good framework would enable Africa to move away from piecemeal approach to ICT for development and to tackling the symptom (digital divide) in a more integrated fashion by elevating access to the level of a public good.

On their part the government should stimulate financing ICT with a focus on poverty. Governments should:

- Promote a concept of digital solidarity with the majority of poor people in Africa and make sure their empowerment and information and knowledge needs met using a mix of old and new innovative financing mechanisms
- Consider universal access to ICTs as a public good and pursue financing mechanisms within the public goods framework to bridge the access gaps of those below the poverty line
- Create enabling legal, institutional and policy environment for increasing access to and effective use of available financing mechanisms
- Remove barriers so that access as a global public good be available to everyone
- Create innovative policy models that promote the participation of non-profit operators in the deployment of ICT infrastructure and development of bottom-up ICT infrastructure using innovative wireless technologies
- Facilitate community-driven approaches to access provision
- Embrace universal access strategies using locally available resources and innovative financing ranging from enforced obligation to operators, establishing universal service funds and employing innovative methods such as minimum subsidy auction and community-driven approaches such as rural cooperatives

- Promote access to alternative and innovative financial resources such as remittances. Remittances represent a significant resource and rely on moral contract that promotes the spirit of public good.
- Design and implement e-strategies within the spirit of public goods for example promoting an integrated planning to ICTs with health, road, energy and other infrastructure at local level
- Support effective use of existing finances by enforcing proper management of resources
- Encourage the participation of local researchers to develop and implement the concept of global public goods
- Actively participate in the global debate on public goods and broader issues on financing development

Effective production of public goods requires collective actions. Therefore, the participation of African countries in the Global Public Good debates is essential. Historically Africa countries were largely excluded from intergovernmental decision-making due to the limited technical and policy capacities, lack of financial resources and inadequate information and the inefficient working methods of global governance system.[66] There is also an evident lack of awareness of global public goods and the role of ICTs in development. Coupled with ineffective coordination among different groups dealing with international policy issues particularly between the ministries of cooperation, foreign affairs, transport and communications and regulatory bodies dealing with telecommunications and broadcasting and inadequate regional cooperation, the participation of African countries in global governance regime is limited. The debate on global public good will not be an exception. It is therefore important that maximum involvement of the African counties in the global public goods debate ensured including their participation in the executive bodies that collect and manage the public goods. The involvement of African researchers in studies that are relevant to public goods and on the application of the concept of public goods should be encouraged.

Finally, for reasons of exceptional financial scarcity and growing development challenges, weak prospects for integration in the knowledge economy specific attention should be given to African countries particularly to the poor. Poverty is very real and daunting. Inspiration and empowerment are critical for bringing sustainable development, because it is the poor that has the capacity and the drive to break the cycle of poverty. Inspired people with innovative ideas could make a lot of difference on poverty. Increasing and nurturing human capability remains a fundamental, but a steep challenge for Africa. The technologies that facilitate the flow of potentially inspiring and empowering information and knowledge should not necessarily be new. A well crafted mix of old and traditional technologies that are adapted to local settings would be important. Similarly financing mechanisms that bring a mix of effective use of traditional sources together with new mechanisms within global public good and digital solidarity tag are essential. In one hand there is a need for greater coordination to align sources of finance with enabling policy environments, on the other new financing mechanisms within the public goods framework should be pursued to bridge the access gaps of those who are the poverty line. These should not be left only to government and international community. Regional

[66] Commonwealth Telecommunications Organization and Panos London, 2002, Louder Voices: Strengthening Developing Country Participation in International ICT Decision-Making, http://www.panos.org.uk/resources/bookdetails.asp?id=1065&null=1002&

organizations such as the African Union and programmes such as NEPAD should play a key role in studying new mechanisms and synchronizing existing sources of finance with enabling policy environments so as to enhance the impact of ICTs on the majority of the African people.

Annex I: Broad-based ICT policies and strategies in Africa

Angola - National Commission for Information Technology, Strategy for The Development of Information technology 2000-2010.
http://www.cnti-angola.gv.ao/strategy.htm

Cameroon - NICI Cameroon,
http://www.uneca.org/aisi/docs/CameroonNICIplan.pdf

Djibouti – Strategie TIC Djibouti, 2003
http://www.mccpt.dj/Documents/Strategie%20TIC%20Djibouti%2020030311%20AM.pdf

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