



Leading Regional Development

Addressing the Digital Divide in the Southern African Universities

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Leading Regional Development

Bandwidth is the lifeblood of the world's knowledge economy, but it is scarcest where it is most needed – in the developing nations of Africa which require low cost communication to accelerate their socio-economic development. Few schools, libraries, universities and research centres on the continent have any internet access. For those that can afford it, their costs are usually thousands of times higher than for their counterparts in the developed world, and even Africa's most well-endowed centres of excellence have less broadband than a home broadband user in North America or Europe.

(Jensen, M (2006). *Lowering the costs of international bandwidth in Africa*)

The digital divide and African universities

- Bandwidth is “the lifeblood of the world’s knowledge economy”: African countries, their universities and research institutions must access low-cost communication to accelerate development
- But Africa is the continent least served by the Internet – and Sub-Saharan Africa is more poorly resourced still
- Goal: SSA universities and research institutions will rapidly cross the digital divide to access broadband and global Internet at the same level as international peers

Nature and extent of the digital deficit

- Africa
 - Population 935-million (14% of world total)
 - Some 33-39-million Internet users (3.5% of world total)
 - Internet penetration 0.2% (16.9% world average, United States 69.9%)
 - Broadband penetration <1% even in South Africa (>25% in many developed countries)
- Southern Africa
 - South Africa an exception in SADC with Internet penetration 10.3% (compare North Africa 8.4%)

Impetus for addressing the digital divide in Southern African HE

- General uptake of digital technology
 - Africa's Internet usage up by 638% in 2000-07 (global 209%)
 - Fast-growing mobile telephony off low base
 - Private high-capacity transmission over optical-fibre cabling substantially deployed by telecoms and power utilities
- Top-level political commitment
 - NEPAD Broadband ICT Infrastructure Network Project aims to connect all African countries to each other and the world
 - Principles of African broadband network: public good, open access, equitable joint ownership of backbone
- Private-sector activity: independent and PPPs
 - Competing projects include: EASSy, KDN, NEPAD, Seacom (current front-runner) and TEAMS
 - EASSy undermined by contention as to whether NEPAD or the private sector should take the lead
- In Southern Africa, HE sector leading the way towards Next Generation Networks and national/regional Research and Education Networks

NRENs and RREN in Southern Africa

- Target
 - Technological catch-up way beyond basic network infrastructure
 - High-capacity (>1Gpbs) backbone networks across countries and the region
 - Open access using any available fibre
 - Network convergence
 - Access to European NGN Géant 2
- NRENS
 - Envisaged: one per country in interconnected networks
 - Operational: Malawi (MAREN=VSAT), South Africa (SANReN/TENET=fibre-optic)
 - Formation/start-up: Botswana, DRC (Eb@le), Namibia (NAMREN), Mozambique (MoRENet), Swaziland, Tanzania (TERNET), Zambia (ZAMREN)
- Pan-African NREN organisation
 - UbuntuNet Alliance (UA) formed 2005
 - Purpose is to organise and operate RREN for SSA, including sub-regional clusters (e.g. South, East)

Constraints/Enablers 1: Infrastructure

- NRENs/RREN connecting Southern African researchers for regional benefit are the strategic “top layer” of a pyramidal set of building blocks
 - Campus-level networks and ICT resources
 - Content and application of these resources in teaching, research, academic support (e.g. libraries)
 - Combination of networks in NREN
 - Regional and global links to wider networks
- Constraints must still be overcome at the first layer
 - Uneven mix of technologies
 - Demand for continuous upgrading
 - Multiple applications of scarce resources (teaching, research, science-specific, admin)

Constraints/Enablers 2: Vision

- Leap needed from technological lens on the issues to a vision of technology as enabler of knowledge and development in Southern Africa
- Persistent and energetic lobbying of government, telecoms operators, donors, etc. required by HE/research sectoral actors with distinctive roles (e.g. UA, SARUA)
- Advocacy must focus consistently on broadband communications for long-term developmental interests rather than contingency needs (c.f. competing regional and national priorities behind Kenyan and South African governments' respective responses to EASSy)

Constraints/Enablers 3: Policy/Regulatory Environment

- SADC countries' policy/regulatory environments currently constrain HE access to RENs: under-capacity, policy inertia/misdirection, inappropriate regulatory controls and institutional arrangements
- Government needs to play many roles including
 - General policy support (e.g. linkage between HE/research and regional/national development plans and collaborative efforts)
 - Consultation (e.g. with academics/researchers around needs of scientific networking)

Constraints/Enablers 3: Policy/Regulatory Environment cont.

- Advocating and enabling affordable broadband infrastructure, open access and favourable NREN access for HE/researchers
- Legislating and regulating to support high-capacity comms networks
- Allocating resources (e.g. direct financial support for NRENs without “strings”, directing resources away from limited legacy networks)
- Regulating/dismantling telecoms monopolies
- Promoting/providing incentives for investment and competition in telecoms markets (and removing prohibitions/disincentives on the offering of different kinds of infrastructure and services)
- Strengthening autonomous regulators of telecoms sector (e.g. to implement competition policies, monitor market progress, build capacity of Ministries to participate in national reform and regional harmonisation efforts)

Constraints/Enablers 4: Cost

- Bandwidth in (Southern) Africa is extremely expensive
 - Long-haul connectivity costs are high (e.g. 63% of bandwidth cost for Wits University (South Africa) in 2005)
 - “Club” consortia, exacerbated by market/regulatory failures, push costs up further (e.g. replication of high-priced SAT-3 model in West Africa)
- Costs can be contained
 - By public-good models for broadband connectivity based on PPPs, cost-recovery and open access
 - By NRENS and RREN serving as bandwidth consortia for economies of scale, cost-sharing and negotiating affordable access (c.f. successes by TENET to date)

Enabling roles

- As regional higher education association for the SADC countries, SARUA aims to assist collaboration in securing bandwidth, establishing NRENS/RREN, etc, by:
 - Advocating NGNs to all role-players in and outside the sector
 - Promoting the participation of members in related initiatives
 - Championing specialist broadband connectivity needs in relation to education, research and science applications
 - Introducing and/or maintaining NREN and RREN issues on the agenda of regional political bodies, national Ministries and government departments
 - Ensuring that policy/regulatory challenges, issues and constraints are identified and addressed
 - Developing relationships/alliances with governments, regulators, private-sector partners, donor agencies, and governance/operating structures of broadband-access initiatives
 - Maintaining a supportive “watching brief” on the evolving goals, strategic objectives, funding and operational plans and functioning of NRENS and RREN