

The Value of Research Networks in Africa

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Much of the discourse around higher education in the southern African region promotes the imperative of a knowledge economy. However, participation in today's globalized economy requires significant investment in capacity and systems needed to generate, use, and share knowledge.

The past three years have witnessed unprecedented improvements in telecommunications infrastructure in the South African Development Community region, bringing the goal of a knowledge economy within closer reach of SADC's 15-member countries and their research and educational institutions. However, without concerted support for the creation of research and education networks that connect nation states with each other and the rest of the world, the full opportunities presented by recent technological developments are unlikely to be realized.

CONNECTIVITY: RECENT DEVELOPMENTS

At the end of 2007, only three of the 15 SADC countries—Angola, South Africa, and Mauritius—had access to a single international submarine cable known as

SAT3/SAFE. The international bandwidth of most SADC countries was still below 100 megabits per second (Mbps), while landlocked countries—such as Malawi, Zambia, and Zimbabwe, and the island nation of Madagascar—had no external fiber connectivity at all.

By 2010, however, the region had access to three submarine networks and now has the potential to benefit from lower connectivity costs. All countries, with the exception of the Democratic Republic of Congo, had high-capacity-fiber connections to their neighbors and onward, to the rest of the world. All countries had over 100 Mbps, with South Africa registering several gigabits of international fiber connectivity—a first in Africa.

The future continues to look highly positive: by 2012 it is envisaged that all SADC countries will have fiber connectivity to at least two networks at competitive prices, and the region will be connected to Europe by at least six submarine cables.

Broadly speaking, improved information and communications technologies mean that universities and researchers gain more ability to access global research facilities, collaborate with experts in the continent and the world, conduct complex research and, essentially, build, store, and share their own knowledge bases. In the SADC region, in particular, this tendency gives countries the opportunity to participate in emerging regional research facilities—such as the Square Kilometre Array radio telescope—or take advantage of high performance computing facilities being established in South Africa.

However, without national research and education networks, which constitute the building blocks for an inclusive regional network, the full benefits

of the telecommunications liberalization currently sweeping through Africa are unlikely to be realized.

NETWORKS: NATIONAL AND REGIONAL ASSETS

Studies in Europe support the idea that national research and education networks are a national asset for economic growth and prosperity (<http://www.serenate.org/publications/d21-serenate.pdf>). Not only are such practices a fundamental source of innovation, allowing researchers to pursue complex research; but they provide a fast and widespread technology transfer to society and industry—unlocking the potential of theoretical research to produce both social benefits and commercial applications. These networks are considered vital national assets that support research, innovation, and collaboration in all fields, with direct contributions to knowledge production and advancement in the areas of education, health, environment and climate, biotechnology, and science and technology.

At a regional level, not only do networks improve the academic and research project by linking academics and researchers across borders, but they can be a powerful economic tool. In Africa, in particular, where the costs of telecommunication remain relatively high, they have the potential, as argued by Duncan Martin in a 2010 Southern African Regional Universities Association’s report, to play a role as “a non profit-seeking aggregator of [educational] institutions’ buying power.” He goes on to state that national research and education networks have “ever-widening opportunities” to deliver more bandwidth at lower costs, by becoming operators themselves and by developing their own infrastructure—where this makes economic sense.

In the context of relative scarcity in the region, pooling facilities and resources to achieve an efficient, high-speed, interconnected regional network with a conducive policy environment would give all countries the chance to reap benefits.

CHALLENGES FOR THE SADC REGION

All countries in Europe, North America, and (to a large extent) Asia, Latin America, and North Africa have established national research and education networks. Yet, the SADC region lags behind significantly, with only two functional national networks—in South Africa and Malawi—while most other SADC countries have networks in formation only.

The challenges facing SADC countries are not insignificant: they range from limited national telecommunications facilities to poor-campus infrastructural facilities. There are also problems associated with a lack of coherent policies, strategies, and plans for research networking at all levels—as well as the absence of national regulatory frameworks in which to promote cross-border connectivity.

Lack of government investment is another challenge. Greater commitment from individual SADC-member states is needed to stimulate the operation of the networks in each country and enable relevant stakeholders to focus on the promotion of cross-border links through the regional network.

THE IMPORTANCE OF LEADERSHIP

Studies suggest that in the developed world, high-speed connectivity for academic and research purposes has, in the main, been the product of direct

government intervention and support. The establishment, based on South African government funding, of the South African National Research Network—with Gigabit-speed connectivity for academic and research networking—shows what is possible when forward-thinking leadership intersects with innovation. Already, this network is linking major universities in South Africa’s Gauteng province, thus accelerating cutting-edge research and development.

Other developments serve a potential impetus for the development of a regional network in Africa and the operationalization of nascent national research and education networks. These procedures include the establishment of the Ubuntunet Alliance, recognized by the European Union as a possible operator of a regional research and education network, comprising cross-border links between national research and education networks in eastern and southern Africa. The West and Central African Research and Education Network—a regional research network for west and central Africa—has also been formed.

Also encouraging is the recent interest by the European Union, through the AfricaConnect Project, in providing stimulus funds for African research and education networks operation. AfricaConnect is a poverty reduction program that aims to harness the potential of information and communications technologies for sustainable development of the region

QUO VADIS?

Ideally, the development of regional networks should be part of a broader cross-border regional program for information and communications technology in higher education. Such an ambitious and wide-ranging project requires support and investment—not only from national governments but from the private

sector, donor community, and the regional higher education sector itself. It is only in bringing together such role-players that the region is likely to take tangible steps toward realizing its ideal of full participation in the global knowledge economy.