Chapter 1
Revitalising Higher Education in the SADC Region
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Introduction

In 2008, higher education in the countries of the Southern African Development Community (SADC) stands at a critically important threshold of challenge and change. The research commissioned by the Southern African Regional Universities Association (SARUA) and published in this volume presents a sobering picture of Southern African higher education. The data point to a profusion of areas of weakness, deterioration, neglect and even identify a vacuum within the higher education systems of the SADC countries. In comparison with higher education systems in the developed world, in the rest of the developing world and in other parts of Africa (e.g. North Africa) there are few areas of strength. Yet this assessment of higher education in Southern Africa cannot stop here. It provides a foundation for a fresh appraisal of how higher education can play its appropriate role in the development of the SADC region and surfaces the data required by SADC governments and higher education institutions to revitalise the planning and funding of this critical sector.

In recent years much attention has been paid to the pivotal role of higher education in the concerted drive for continental renewal, commonly referred to as the African Renaissance. The link between higher education and economic development is inescapable in a global knowledge economy:

The key to economic success in a globalized world lies increasingly in how effectively a country can assimilate the available knowledge and build comparative advantage in selected areas with good growth prospects, and in how it can enlarge the comparative advantage by pushing the frontiers of technology through innovation. … [T]he arbiter of economic success – even survival – in the world today is the capacity to mobilize knowledge and to use it to the full (World Bank, 2008:3).

Moreover, in contemporary understanding, development is increasingly accepted to be about much more than objectives of economic growth, productivity or the enhancement of human capital. Rather, development is “a complex process encompassing a broad matrix of objectives, which include political, social, economic and cultural considerations” (Motala and Chaka, 2004). Higher education can contribute to all these dimensions in Southern Africa: to democritisation by forming a critical citizenry and fostering critical intellectual debate; to social justice, equity and social mobility by creating opportunities for advancement on the basis of acquired knowledge and skills; to economic growth and competitiveness by producing highly skilled graduates for the labour market in the private and public sectors, and by applying its knowledge and technological capacities to economic sectors; and to socio-economic development more broadly, by generating new and indigenous knowledge as well as innovative solutions to local and regional problems and challenges in many spheres.

The nexus between higher education and development in Africa has been endorsed at the highest levels of continental and Southern African leadership, backed by formal protocols, plans and resource

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1 The SADC countries are: Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. A 15th country, the Seychelles, was re-admitted to SADC in August 2008 (having been forced by human resource and financial constraints to withdraw in 2003).

2 Also at www.sarua.org.
allocations to underpin its revitalisation. The formulation of these commitments at this point in African history gives them a particular significance.

In the countries of the SADC region, as in other African countries, higher education systems were shaped by colonial histories. Colonial powers were slow to establish universities and, when they did so, established them along colonial models. After independence the colonial academic heritage was therefore at odds with the forces of nationalism and, for this reason, the purpose of the university was reconceived. Universities were called upon to serve the development needs of the society as formulated by the political leadership of the day. Ultimately the concept of the ‘development university’ did not serve Africa well: universities so defined came variously under pressure of state authoritarianism, fiscal crisis and the structural adjustment programmes of foreign donors. The World Bank contributed to deflecting public investment from higher education, claiming that investment in primary education would yield greater individual and social returns. By the time this orthodoxy was overturned in the mid-1990s, the higher education systems of many Southern African countries were already well into decline.

Although some commitments had been made along the way towards the rebuilding of African higher education (e.g. resolutions taken by the Organisation of African Unity), these failed to bear fruit. In the absence of legitimate and competent institutional support, higher education was unable to accumulate robust capabilities and capacities, or to engender transformed institutional cultures.

Yet, from the latter part of the 1990s, a shift began to occur. SADC had been established in 19923 with the objective of supporting socio-economic growth through regional integration. In its 2001 Regional Indicative Strategic Development Plan the region acknowledged that tertiary education had to be strengthened to boost the competitiveness of the region. In its 1997 Protocol on Education and Training (Preamble), it emphasised the importance of conjoined (higher) education and regional development in Southern Africa and its constituent nations. With the formation of the African Union (AU) in 2002, new possibilities for giving substance to these intentions at continental and sub-regional levels began to open up. They have met with the support of key international donors and their initiatives, including the World Bank4 and the Zambezi Forum on Higher Education, which it sponsored in 2004-05, and the G8’s 2005 Commission for Africa5. Other important initiatives include the Partnership on Higher Education in Africa, which includes the Ford Foundation, Carnegie Corporation of New York, The Rockefeller Foundation and Catherine T. MacArthur Foundation, and initiatives by DFID, SIDA and the IDRC.

The AU and the New Economic Partnership for Africa’s Development (NEPAD) have placed higher education renewal firmly on the continental and regional development agendas. The AU Plan of

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3 As a successor to the Southern African Development Co-ordination Conference (SADCC) established in 1990 to co-ordinate development projects aimed at lessening the region’s economic dependence on apartheid South Africa.

4 In Sub-Saharan Africa, higher education represents 19% of total World Bank lending in education since 1990 (worldwide higher education lending has amounted to approximately 20% of total lending in education). See World Bank (2008:22).

5 Set up by then United Kingdom Prime Minister Tony Blair and the G8 Gleneagles Summit of 2005.
Action for the Second Decade of Education in Africa, NEPAD’s promotion of centres of excellence in science and technology, and the Association of African Universities Regional Capacity Mobilisation Initiative are all testimony to this. SADC itself is an important actor in these developments and is generating fresh commitments of its own – for example, its members signed in August 2008 a Protocol on Science, Technology and Innovation6. The AU Plan of Action sums up the continental goal for higher education renewal this way:

Complete revitalisation of higher education in Africa, with the emergence of strong and vibrant institutions profoundly engaged in fundamental and development-oriented research, teaching, community outreach and enrichment services to the lower levels of education; and functioning in an environment of academic freedom and institutional autonomy, within an overall framework of public accountability (African Union, 2006: section 2.4, para 42).

Thus, after its decades of neglect, Southern African higher education is now given a critical opportunity to realise its potential, one which its countries and higher education systems cannot afford to let slip. Rapid technological advancement in the global knowledge economy – the cutting edge of which is dominated by the universities of developed countries – threatens to leave developing countries and their institutions on the wrong side of the digital divide.

The revitalisation of higher education for regional socio-economic development means more than a game of ‘catch-up’; it requires an accelerated, transformative leap. It also depends on the development of Southern African answers to Southern African problems in a Southern African context, rather than launching an undifferentiated scramble to measure up to global forces.

It is high time that universities, in the North and in the South, become more active and self-conscious participants in the struggle for a more balanced order of knowledge creation and for the authenticity of knowledge … Meeting this challenge would also re-connect higher education to a particularly important item on the agenda of national unification: the creation and the nurturing of a national identity of knowledge that both recognises the power and the inevitability of the international knowledge order and serves as a catalyst for re-legitimating local and national traditions of knowledge (Weiler, 2008:13).

The countries of SADC are of course aware of all of this. SARUA7 owes its existence to such an understanding and to the realisation that concerted collaborative effort8 offers the most viable means of harnessing capability, capacity and energy for change of the magnitude required. Yet it remains important to get to grips with the implications of initiating a higher education revitalisation drive from

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6 Although it can be noted that the SARUA research found the Regional Indicative Strategic Development Plan, the Protocol and the evolving SADC Qualifications Framework associated with it to be out-of-date and lacking in implementation details. See Chapter 2:120.

7 Founded in February 2005.

8 SARUA is a membership organisation for the 66 public universities and heads of university-level public research institutes in 14 SADC countries (i.e. not yet including the Seychelles).
a weakened platform, characterised both by general under-development and by ‘outliers’ – weaker and stronger than the average that illustrate the additional challenge of uneven development. The fundamental implications – that political will and regional co-operation are non-negotiable in providing the impetus for large-scale change – have already been noted. While this introduction cannot list exhaustively all the implications for SADC of a concerted higher education revitalisation drive, it can draw attention to some that are most evident.

It is obvious that strategic change must be empowered by reliable information. Transformation cannot occur until reality, even bleak reality, is known. Unfortunately, reliable data and information providing evidence and texture to the generalised picture of Southern African higher education are very hard to come by. The SARUA research programme that has given rise to this consolidated analysis is precisely an attempt to begin to establish the parameters of what is and what can be.

On the other hand, even the generalised picture is sufficient to make it perfectly plain that revitalisation has to proceed across the board. It is the whole of higher education – all its structures, frameworks and functions, and not select pockets of higher education – that begs for attention. The existence of some comparatively stronger higher education systems within the SADC region does not change this; while they may in some cases offer models of good practice, the risks and consequences attendant on skewed development is part of what has to be addressed. Given, however, that it is impossible to proceed on all fronts at once, a consensus must be developed around strategic starting points, such as: critical priorities, potential ‘early wins’, leverage points for progress, stumbling blocks to be removed, essential partners and their respective roles and responsibilities.

A final critical implication is that the modalities employed for revitalisation must support an understanding of higher education as central and not peripheral to regional development. In the first place, this is what renders collaboration essential. All frameworks and initiatives generated must be cross-regional in their orientation. While the uniqueness of countries and systems are to be recognised and accommodated as appropriate, the focus must constantly be directed towards the benefits of policy and action for regional upliftment as a shared enterprise.

It follows too that advocacy is key: the link between higher education and development must consistently be profiled and reiterated by regional and higher education leaders to create a groundswell of understanding amongst all stakeholders. The need for substantive engagement between the higher education sector, governments, public sector, private sector and civil society actors must be amplified. Where higher education institutions are properly recognised as social instruments, their purposes and needs will be owned and vigorously defended by the public.
Part 1: Purpose of the consolidated analysis

In support of its aim to position higher education as a major contributor to regional development, SARUA has in its first two years of operation instituted a core of programmatic, networking and communication initiatives (SARUA, 2007). These include a programme of research to provide substantive leads for the unfolding work of higher education revitalisation in Southern Africa.

In particular, during 2007 and 2008, SARUA commissioned studies to provide baseline data and perspectives – until now deficient – and to generate critical observations on topics chosen for their significance and relevance as priority pillars in higher education development. Functioning as a set, the studies were designed to illuminate systemic themes, concepts and strategic directions for building the regional agenda on higher education revitalisation.

This consolidated analysis draws together the most striking data, findings and conclusions of the studies9. Its primary purpose is to support strategic conversations about the revitalisation of Southern African higher education between key participants and partners. These include: representatives of SADC governments, public sectors, private sectors and industries, and civil society; international development agencies, potential donors and funding bodies; and, of course, SARUA’s member institutions and counterpart sectoral and stakeholder bodies in the SADC countries. SARUA trusts and intends that such conversations will yield the following outcomes:

• Deeper knowledge about the quantitative and qualitative attributes of higher education in the region e.g. the profile of the sector, the nature and quality of research focus and outputs, the available base of funding, the presence or absence of linkages between higher education and sectors of the economy, and the needs of higher education leadership.

• Identification of issues (including funding issues, which are inevitably of central importance) forming the core of engagement between higher education and government, especially so as to clarify and exemplify the role of higher education in national and regional development.

• Identification of priority issues for discussion between higher education and business, engaging both parties in the work of building research, technological and innovation capacity for key areas of economic development in SADC countries and the region.

• Linkages between higher education and civil society organisations in an exploration of the role of higher education as a space for public engagement, democratisation and citizen empowerment in Southern Africa.

• Potential for various partnerships in higher education teaching and research, including amongst others: scholar exchanges, joint projects in research and development, optimal use of research infrastructure, and mentoring initiatives. This could promote institutional collaboration and the formation of regional networks around specific areas of interest.

9 There are numerous rich insights and significant data in the individual reports that this analysis could not include. Interested readers are directed to the reports published in this volume and at www.sarua.org to pursue individual topics in more depth.
The initiation of the process of gaining a better understanding of the nature, scope and quality of private higher education provision in the region.

1.1 Research informing the consolidated analysis

Strategic discussions and initiatives of the kind envisaged would not use the SARUA studies as their only reference points; there is a much wider and growing pool of sources upon which to draw. These include the documents, reports and analyses arising from the overall continental drive for higher education revitalisation, occurring under the auspices of the African Union (AU) and others already referred to; national policy documents, reviews and critical policy analyses generated by SADC countries; a regional literature, both scholarly and general (e.g. media reports); and the developing work and research of SARUA itself.

For the purposes of this particular analysis, SARUA’s most recent research provides the field of interrogation (and so the boundaries of that interrogation). The source documents of this consolidated thematic analysis are:

- A study of the profile of higher education in the SADC countries (Chapter 2). In 2006 SADC education ministers emphasised the need for a regional baseline study on higher education and SARUA was ultimately tasked with conducting this study. The regional report, published in Chapter 2 in this volume, synthesises individual country reports for the 14 SADC countries in SARUA’s membership, in order to provide a foundational understanding and some benchmarks with respect to challenges, strengths and weaknesses of higher education at institutional, national and regional levels.

- A study of higher education financing and funding frameworks (Chapter 3). The chapter maps trends and gaps against the background of African public higher education sectors, which have tended to be inadequately and inequitably funded. It analyses, for example, current levels and patterns of public funding of higher education in the international context of developing countries; levels and patterns of public funding of higher education in comparison with other levels of education; and questions of equity, effectiveness and efficiency in public higher education expenditure.

- A study of public science in the SADC countries (Chapter 4). The chapter assesses aspects of public science in the region, with the overall aim of establishing its robustness in the light of both global and regionally defined imperatives. The study includes an assessment of the governance of science; its funding base; the robustness of research institutes; the visibility of academic science; and the alignment between public science and the development goals of respective countries.

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10 SADC has set 2015 as the target date for having in place an integrated database of key statistics to support processes of regional integration and development. The World Bank indicators of the statistical capacity of countries show that in 2007, SADC member countries’ statistical capacity was similar to that of other low- and middle-income countries, but no countries met international standards on a composite indicator (South Africa met international standards on the specific dimension of statistical practice). See Chapter 2:48,66,68.
A study of university-firm interaction and “national systems of innovation” (NSI) in the SADC countries (Chapter 5). The chapter considers universities’ double developmental role as employers and producers of skilled human resources, producers of research, and facilitators of technological upgrading for firms – with a special focus on the latter. Empirical research investigates the multiple forms of interaction possible in order to propose linkages from the perspective of universities in the SADC countries.

The research projects were guided by certain generic goals, methodologies and outputs incorporated into their individual research designs. In particular, the projects sought to identify and engage with SARUA’s institutional membership and leaders in its institutions, and with a regional network of researchers and policy makers (including ministries of education), engaged through instruments and processes such as questionnaires, interviews, focus groups and research visits.

11 Respective research project designs, methodologies, data collection instruments and various challenges and issues arising (e.g. data accuracy, data comparability, contextual considerations) are discussed in individual chapters.
Part 2: Key data and themes emerging about SADC higher education

2.1 The regional context as starting point

The introduction to this section argues that Southern African higher education revitalisation must be conceived and executed within the specificities of the Southern African context. Indeed, the record shows that achievement of regional objectives is premised by SADC itself on an acknowledged need for ‘deep integration’ and broad-based capacity development built on commonality of evolving values, systems and institutions; self-sustaining development, collective self-reliance and interdependence; complementarity between national and regional strategies and programmes; and consolidation of historical, social and cultural affinities among the peoples and member states of the region. The prevailing need for deep integration and capacity development is strongly rooted in Southern Africa’s history of colonialism and independence movements; post-independence development efforts, failures, conflicts and reconstruction programmes; inadequate public funding and investment; and donor reliance (see Chapter 2: 57, 69-70).

The SARUA research highlights key information and data confirming a legacy of relative poverty and under-development as the starting point for higher education renewal (see Chapter 2: 69-74; Chapter 5). In its founding documents and strategic development plan, SADC views poverty, HIV/AIDS12 and a shortage of critical skills as key threats to the achievement of its development objectives. Patterns of economic activity in the region flag further challenges. For example, agriculture is a dominant economic sector for most SADC states, while principal SADC exports tend to be primary products with minimal value added prior to exporting. Unsurprisingly, against this background, the SADC countries do not feature well in various international rankings – yet by an inverse process, these data provide a baseline for formulating incremental targets and improvements to be tracked as indicators of positive progress.

• In 2006 gross domestic product per capita (or income) in SADC countries ranged between a low of US$175 (Malawi) and a high of US$5 720 (Botswana).

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According to SARUA (2008:3) “HIV/AIDS is currently a major crisis for the Southern Africa region exerting a devastating toll on individuals, families, societies and economies in general. It is having an increasingly damaging impact on the region’s universities institutionally, in terms of new student enrolment, retention of staff and existing students, as well as research quality and capacity. There is also the external impact on unmet demand for graduates in the public and private sectors, especially for business and political leaders, teachers, medical professionals, senior civil servants, the judiciary, diplomats, the military and police … SARUA seeks to utilise the considerable amount of work already done by a number of universities in the region, consolidate international best practice, and to promote innovative approaches to HIV/AIDS management amongst its members to secure institutional stability and ensure the growth of higher education.”
On the 2007-08 Human Development Index of 177 countries, the rating of SADC countries ranged from 65 (Mauritius) to 172 (Mozambique). SADC countries therefore fall almost entirely into the lower half of the Human Development Index, a measure based on life-expectancy, education levels and per capita income. Only Mauritius (65) is classified as demonstrating high human development; South Africa (121), Botswana (124), Namibia (125), Lesotho (138), Swaziland (141), Madagascar (143) and Zimbabwe (151) are classified as medium; and Tanzania (159), Angola (162), Malawi (166), Zambia (165), the DRC (168) and Mozambique (172) as low.

On the World Bank’s Knowledge Economy Index for 2006, the average score for Sub-Saharan Africa relative to the rest of the world was a low 2.78, having declined from 3.12 in 1995. Five SADC countries exceeded this average: South Africa 5.79, Mauritius 5.43, Namibia 4.23, Botswana 4.02 and Swaziland 2.83. Zimbabwe, Lesotho and Tanzania all scored above 2. On a composite indicator, only South Africa and Mauritius had moved upward over time, with Namibia static and other countries experiencing various degrees of decline.

2.2 System-level governance in higher education

From this weak base, SADC higher education is being called upon to play a role in areas as diverse as regional poverty reduction and knowledge economy participation. If higher education is to respond to these calls (within the ambit of what is appropriate, realistic and possible for the sector), strengthening of governance and leadership capacity within higher education is a key starting point. Internationally, higher education governance has evolved since the 1980s under the influence of such factors as massification, public funding reduction, adoption of new public management ideals with a stress on the accountability and efficiency domains, new relations and forms of relations with the state, and the adoption of market mechanisms and competition in a previously insulated sector. These factors impact on SADC higher education governance at both system and institutional levels, alongside challenges arising from years of sectoral under-funding, poor infrastructure, brain drain and sometimes isolation from the global higher education and market environments.

System-level governance of higher education in the SADC region is diverse, including strong systems of state control and higher education systems where the state takes a supervisory role in relation to autonomous institutions. In general, all SADC higher education systems reflect a trend towards the establishment of statutory bodies tasked with guiding and monitoring system and policy development and with supporting higher education quality. However, individual arrangements are highly uneven in respect of all of these. For example, while the establishment of an envisaged SADC Qualifications Framework will depend on the extent of development of quality assurance systems in each member state, at least five countries (Angola, Botswana, Malawi, Namibia and Swaziland) do not yet have national level quality assurance systems in place. Also uneven is the participation

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14 Moreover the equivalence of various bodies and arrangements across systems is not at all clear.
of stakeholders in national policy processes: just 42% of SARUA member public higher education institutions in the region regard themselves as playing a significant role in these.

A number of systemic issues are variably identified by SADC higher education sectors as posing a challenge for governance and leadership at system and institutional levels. These include:

- difficulties of system co-ordination (between government departments, government and institutions, public and private higher education sectors, different levels of the national education system, and between higher education graduates and the labour market);
- inadequate funding;
- insufficient qualified staff/capacity;
- poor resources and infrastructure;
- shifting, evolving or poorly established qualifications frameworks and quality assurance systems;
- rapidly expanding student numbers;
- high student drop-out and low student throughput; and
- poor statistical data to support policy and decision-making.

2.3 Public higher education financing\(^{15}\)

Adequate and appropriate higher education financing is critical to enhancing access, equity, quality, efficiency and sustainability in the sector, as well as underpinning the overall linkage between higher education and development. Through sound higher education policies and interventions, governments can guide systems to ensure they provide equitable educational opportunities to individuals and serve as a vehicle for social mobility and cohesion.

Yet in their responses to the SARUA research enquiry, ministries of education as well as public higher education institutions in SADC countries (and others) noted a range of challenges related to inadequate funding and investment in higher education. They include:

- a declining proportion of core public funding for higher education, owing to fiscal constraints or low prioritisation by government;
- competing demands for public funding and for private/donor funding from other parts of the public sector and from other education sectors;
- expanding numbers of students, many of whom also require financial aid;
- declining infrastructure, suggesting the need for massive capital investment;

eficient application of funds by governments through e.g. absence of defined funding mechanisms (such as formulas), poor planning, poor oversight (including of loan schemes), poor monitoring, and excessive public expenditure on students studying overseas; and

- inefficient use of available funds by higher education institutions, demonstrated by e.g. high student drop-out and repetition rates, and high proportions of overhead and salary expenses for non-academic staff.

While the research identified the latest available data for annual public expenditure on higher education in SADC countries, it is difficult to discern overall trends and benchmarks for the percentage of national education budget allocated annually to higher education, given existing data gaps and individual variances (compare Table 1 and Table 2).

### Table 1 Percentage of the national education budget allocated annually to higher education

<table>
<thead>
<tr>
<th>Country</th>
<th>2003 (%)</th>
<th>2004 (%)</th>
<th>2005 (%)</th>
<th>2006 (%)</th>
<th>2007 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Botswana</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>DRC</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Lesotho</td>
<td>10,0</td>
<td>10,0</td>
<td>11,0</td>
<td>12,0</td>
<td>15,0</td>
</tr>
<tr>
<td>Madagascar</td>
<td>9,9</td>
<td>11,4</td>
<td>9,4</td>
<td>12,0</td>
<td>10,7</td>
</tr>
<tr>
<td>Malawi</td>
<td>11,6</td>
<td>10,7</td>
<td>17,0</td>
<td>19,7</td>
<td>20,0</td>
</tr>
<tr>
<td>Mauritius</td>
<td>14,7</td>
<td>14,1</td>
<td>14,1</td>
<td>14,4</td>
<td>14,0</td>
</tr>
<tr>
<td>Mozambique</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>3,1</td>
<td>3,4</td>
</tr>
<tr>
<td>Namibia</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>South Africa</td>
<td>12,6</td>
<td>13,0 (estimate)</td>
<td>13,0 (estimate)</td>
<td>13,0 (estimate)</td>
<td>13,0 (estimate)</td>
</tr>
<tr>
<td>Swaziland</td>
<td>20,1</td>
<td>22,3</td>
<td>22,7</td>
<td>18,6</td>
<td>21,9</td>
</tr>
<tr>
<td>Tanzania</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Zambia</td>
<td>15,0</td>
<td>15,7</td>
<td>25,0</td>
<td>17,3</td>
<td>10,6</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>26,1</td>
<td>25,2</td>
<td>26,5</td>
<td>27,5</td>
<td>31,0</td>
</tr>
</tbody>
</table>

Source: Chapter 2:73-74
Table 2  Annual government expenditure on education and higher education (most recent year for which data were available)

<table>
<thead>
<tr>
<th>Country</th>
<th>% gross domestic product on education</th>
<th>% government budget on education</th>
<th>% education budget on higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Botswana</td>
<td>9,0</td>
<td>No data</td>
<td>12,5</td>
</tr>
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<td>DRC</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Lesotho</td>
<td>21,0</td>
<td>25,5</td>
<td>40,0</td>
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<tr>
<td>Madagascar</td>
<td>3,2</td>
<td>25,0</td>
<td>10,0</td>
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<td>Malawi</td>
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<td>No data</td>
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<tr>
<td>Mauritius</td>
<td>3,1</td>
<td>13,0</td>
<td>11,2</td>
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<tr>
<td>Mozambique</td>
<td>6,5</td>
<td>No data</td>
<td>60-70,0</td>
</tr>
<tr>
<td>Namibia</td>
<td>No data (estimated high in SADC group)</td>
<td>No data</td>
<td>15,0</td>
</tr>
<tr>
<td>South Africa</td>
<td>5,1</td>
<td>27,7</td>
<td>14,5</td>
</tr>
<tr>
<td>Swaziland</td>
<td>6,2</td>
<td>19,5</td>
<td>22,0</td>
</tr>
<tr>
<td>Tanzania</td>
<td>4,0</td>
<td>25,0</td>
<td>21,9</td>
</tr>
<tr>
<td>Zambia</td>
<td>No data</td>
<td>No data</td>
<td>17,6</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
</tbody>
</table>

Source: Compiled from Chapter 3 Part 1

For most SADC countries, the vast majority of higher education funding currently comes from government subsidy and student fees, with limited income from third stream sources (see Table 3). Only two countries (Malawi and Mozambique) provide public higher education at almost no cost to the student, while students in the DRC and Mauritius are responsible for a large portion of the funding (48,3% and 58,5% respectively). No consistent picture emerged from the SARUA baseline research as to whether or not funding sources had changed significantly in the last ten years.
Table 3  Sources of higher education funding as reported by higher education institutions (most recent year for which data were available)

<table>
<thead>
<tr>
<th>Country</th>
<th>Student fees</th>
<th>Government subsidy</th>
<th>Donations</th>
<th>Loans</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Botswana</td>
<td>26,0</td>
<td>74,0</td>
<td>0,0</td>
<td>0,0</td>
<td>0,0</td>
</tr>
<tr>
<td>DRC</td>
<td>48,3</td>
<td>33,3</td>
<td>4,5</td>
<td>0,0</td>
<td>0,0</td>
</tr>
<tr>
<td>Lesotho</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Madagascar</td>
<td>19,6</td>
<td>75,4</td>
<td>0,2</td>
<td>0,2</td>
<td>3,8</td>
</tr>
<tr>
<td>Malawi</td>
<td>7,7</td>
<td>91,3</td>
<td>0,5</td>
<td>0,0</td>
<td>0,5</td>
</tr>
<tr>
<td>Mauritius</td>
<td>58,5</td>
<td>39,5</td>
<td>0,0</td>
<td>0,0</td>
<td>2,0</td>
</tr>
<tr>
<td>Mozambique</td>
<td>1,3</td>
<td>88,5</td>
<td>0,5</td>
<td>0,0</td>
<td>10,8</td>
</tr>
<tr>
<td>Namibia</td>
<td>21,0</td>
<td>62,0</td>
<td>13,0</td>
<td>0,0</td>
<td>4,0</td>
</tr>
<tr>
<td>South Africa</td>
<td>29,3</td>
<td>46,0</td>
<td>2,6</td>
<td>3,4</td>
<td>13,9</td>
</tr>
<tr>
<td>Swaziland</td>
<td>20,0</td>
<td>66,0</td>
<td>0,0</td>
<td>0,0</td>
<td>0,0</td>
</tr>
<tr>
<td>Tanzania</td>
<td>18,9</td>
<td>62,6</td>
<td>14,1</td>
<td>0,0</td>
<td>3,0</td>
</tr>
<tr>
<td>Zambia</td>
<td>31,5</td>
<td>62,0</td>
<td>0,0</td>
<td>0,0</td>
<td>6,5</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>12,4</td>
<td>82,4</td>
<td>0,2</td>
<td>1,3</td>
<td>4,2</td>
</tr>
<tr>
<td>Regional average</td>
<td>24,6</td>
<td>65,3</td>
<td>3,0</td>
<td>0,5</td>
<td>4,1</td>
</tr>
</tbody>
</table>

Source: Chapter 2:106-107

The SARUA study of funding frameworks noted that there has been a clear shift towards some notion of cost-sharing in the form of tuition fees in some countries (e.g. Namibia, Zimbabwe and Zambia). In some countries (e.g. Tanzania, Zambia and Zimbabwe) this has taken the form of a dual-track system where a fee-paying system co-exists with a free, government-sponsored scheme for some students. Second, governments in virtually all SADC countries have permitted the introduction and subsequent expansion of the private higher education sector. Unfortunately, these shifts have sometimes tended to result in inequities in access and deficiencies in quality. Thus, in Zambia and Zimbabwe, cost-sharing has been only for those who cannot access government sponsorships (usually accessed by more affluent students from the best schools). Furthermore, private higher education in Africa, unlike in the industrialised world, appears to be where many of the poor seek access – but these for-profit providers often operate in the absence of a regulatory framework and deliver education of questionable quality.

National estimates of the percentage of higher education students receiving additional financial support varied widely (from 0% to 1% in Angola, Lesotho and Namibia, to 95% in Botswana and Swaziland) and would need further testing for reliability.
Some good practices for higher education financing in the SADC context – both existing and potential – have emerged from the SARUA research (see Table 4). In particular, alternative funding mechanisms for enhancing access, equity, efficiency and quality are needed. Possibilities include: forms of cost sharing, loan schemes and funding formulas. In addition, increased private sector support of higher education, especially through public-private partnerships, appears to be required. At present, financial support from business and industry forms part of higher education funding streams in only six countries.

Table 4  Good practices for SADC higher education financing

<table>
<thead>
<tr>
<th>Good practices</th>
<th>Existing country examples</th>
<th>Some issues and cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing practices to counter inadequacy of public expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public-private partnerships in the establishment of new higher education institutions</td>
<td>Botswana, Zambia</td>
<td></td>
</tr>
<tr>
<td>Differentiated funding model for public higher education institutions</td>
<td>Mauritius</td>
<td></td>
</tr>
<tr>
<td>Cost sharing through the introduction of tuition fees</td>
<td>Mauritius, Namibia, Tanzania, Zambia, Zimbabwe (South Africa has always had tuition fees)</td>
<td>Mechanisms required to manage inequities of access</td>
</tr>
<tr>
<td>Other forms of cost sharing and cost recovery  e.g. raising tuition fees, special fee-paying track for some students, user charges (e.g. registration fees), reduction in grants, scholarships and subsidies on student loans</td>
<td></td>
<td>Split of cost difficult to establish Measures must be compatible with access and equity of opportunities</td>
</tr>
<tr>
<td>Financing practices to address equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provincial (rural) scholarships</td>
<td>Mozambique</td>
<td></td>
</tr>
<tr>
<td>Loans (grants) to lower-income students in private higher education institutions</td>
<td>Botswana, Tanzania</td>
<td></td>
</tr>
<tr>
<td>Loan (financial aid) schemes</td>
<td>South Africa, Namibia (but this scheme benefits relatively few students)</td>
<td>Substantial initial investment required Difficulties of cost recovery through loan repayments from graduates May be poor matching of private and public loan schemes</td>
</tr>
<tr>
<td>Financing practices to address efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linking higher education planning to budgeting</td>
<td>South Africa</td>
<td></td>
</tr>
<tr>
<td>Dedicated funding facilities for quality enhancement</td>
<td>Mozambique</td>
<td></td>
</tr>
</tbody>
</table>
Good practices | Existing country examples | Some issues and cautions
--- | --- | ---
Funding formulas to promote effective and efficient utilisation of financial resources | South Africa | Simplicity is preferable to complexity
| | | Appropriate consultative mechanisms needed for formula development
| | | Effective data management systems needed to support implementation

Source: Chapter 3:189-139

2.4 System-level governance and funding of public science

Consistent with trends in higher education systems, the SARUA research found public science systems in the SADC region to be weak in governance and poorly funded. This has roots in the patterns of development of the science and technology systems.

Three trajectories characterise the ‘governance of science’, where this comprises elements such as science and technology policy; priorities and alignment with national socio-economic goals; a network of supportive structures; appropriate science funding; and monitoring agencies, such as a national agency for research funding.

Under a first trajectory, countries such as South Africa (and possibly Zimbabwe) developed a first science and technology policy in the years following major political change (post-apartheid/post-independence), which over a period of years became dormant and ineffectual; a second wave of policy revision was instigated during or after the 1990s. Under a second trajectory, countries such as Botswana, Lesotho, Madagascar, Malawi, Mozambique, Namibia and Tanzania established their first science and technology policies in the 1990s or more recently. A third category of countries have no science governance policy (Angola, DRC, Mauritius and Swaziland).

In the SADC region, only Angola, Botswana, Malawi, Mozambique, Namibia, South Africa and Tanzania have a dedicated ministry for science and technology. Botswana, Malawi, Mozambique, South Africa, Tanzania, Zambia and Zimbabwe have a national agency for research funding. Information is patchy as to central co-ordinating offices for research funding at the level of main universities in each country, but arrangements seem to exist in at least half of the SADC countries.

See Chapter 4:200-204, 207-208, Section1.1.4 on page 232, Section1.2 on page 235, Section 1.5 on page 290.
Where science and technology policies do exist, there is an imitative quality to the content and emphasis of the documents, as well as a tendency to uncritically adopt policy approaches from elsewhere. As an example, many of the documents adopt the concept of a 'national system of innovation', although this may be far from appropriate to the developmental state of countries’ science systems.

While a number of the policies and plans set themselves the target of expending 1% of gross domestic product on research and development\(^\text{17}\), only South Africa is currently approaching this target (0.93% in 2005/6). Mozambique has over the past decade made special efforts to invest more in research and development with a resulting expenditure of 0.6% of gross domestic product in 2002. Botswana, the DRC and Tanzania spend 0.3% to 0.4%, and other countries spend less than 0.2%\(^\text{18}\).

The problematic nature of the funding of public science manifests in various ways, including:

- lack of national government commitment to stated ideals of expending 1% of gross domestic product on research and development;
- lack of central infrastructure for co-ordinating and facilitating science funding, and its alignment with national research goals; and
- high dependence on foreign funding for science and technology in most SADC countries. In the SARUA study on public science research, 6% of survey respondents in South Africa said that more than 70% of their total research funding comes from international funding organisations; the comparative figure for the other SADC countries is 42%.

The combination of factors means that governments in the SADC region cannot steer research efforts in any meaningful way, and these may instead be swayed by the research priorities of international funding agencies – see Figure 1. Nonetheless, SARUA’s research found that most scientists in the region are able to pursue their own research interests (95% in South Africa, 80% in other SADC countries). For South African scientists, alignment with national goals is a secondary concern (67%) followed by access to funding (49%). For scientists in other SADC countries, alignment with national goals is a more important consideration (89%), alongside access to funding (58%).

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\(^{17}\) By way of comparative benchmarks, the average proportion for European Union member states in 2005 was around 1.9% and for the countries with the highest research and development intensity in the world (Finland, Sweden and Singapore), it exceeded 2.0%. See Chapter 4.201.

\(^{18}\) No information was available for Angola, Malawi, Namibia and Swaziland.
2.5 Core higher education focus: Teaching, research, community engagement

SADC higher education must develop capacity and quality in all three core functions of higher education – teaching and learning, research, and community engagement – in order to contribute to human capital formation and knowledge generation.

For the present, SADC higher education's ability to produce high-skilled graduates is constrained by, amongst other things, low enrolments in essential fields of study, limited postgraduate study opportunities and critical staff shortages (see Sections 2.6, 2.7 and 2.9). SADC's share of world science is declining and the quality of its knowledge production deteriorating (see Section 2.8). Community engagement is apparently not yet regarded as a higher education core function by SADC universities (see data below), despite regional leadership's view that integration between higher education and development is of the highest importance.

Estimated on average – and based on the perceptions of responding institutions in the SARUA baseline study, rather than on any objective measure of institutional focus – SARUA member public higher education institutions focus their missions mainly on teaching and learning (65% of focus). They focus significantly less on research (22%), and least on community service/outreach/engagement (11%), which is generally not accorded the status of a core function.

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19 See Chapter 2:76-79.
The indicative estimate for research focus is of intrinsic concern, given the important function that universities play in generating knowledge. Furthermore, institutional research focus may be even lower in practice, given that surveyed institutions in all but two countries focus less than 30% of their attention on research.

2.6 Higher education institutional landscape: Size, shape and enrolment

Regional higher education is generally diverse, while demonstrating some key intra-regional trends. Many universities in the region are very young, with the majority having been established from the 1980s onwards. They exhibit a trend to establish multiple campuses in order to expand their reach and widen access. The majority have science, arts and commerce faculties, with far fewer having law and engineering faculties.

SADC higher education as a sector displays low overall enrolment and participation (see Table 5). According to the SARUA baseline study (Chapter 2), figures for the gross tertiary enrolment ratio in individual countries ranged from 1% in several countries, to 15% in South Africa and 17% in Mauritius, while most SADC countries rate between 2% and 4%. The SARUA study of funding frameworks (Chapter 3) cites 2008 UNESCO data showing the median tertiary education participation rate for Sub-Saharan Africa at 2.5% (compared to the developing country median of 13% and the industrialised country median of 58%).

There is a growing private higher education sector in the countries of the SADC region (see Table 5). In terms of number of institutions, the private higher education sector outnumbers the public sector in a number of countries (and private provision of higher education has been on the increase globally). However, based on estimates provided by ministries of education, overall enrolment in the private sector remains lower than that in public higher education in all SADC countries. More research is required to provide a better understanding of the private provider environment and to inform policy-making at institutional, national and SADC levels.

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20 Chapter 5:341-342 provides an analysis of prioritisation of staff time for the universities included in that study’s sample (which excluded South African universities). This supports the finding that universities maintain a strong focus on teaching, with less than a third of academic time spent on research.

21 See Chapter 2:71-73, 80-88; Chapter 3:134-135; Chapter 5:337.

22 Chapter 2 points out the definitional problem in gauging the gross enrolment ratio of higher education, given that different SADC countries base this measure differently. This source cites a range from 0.4% in Malawi to 15% in South Africa and 34% in Mauritius.

23 Enrolments in South Africa constitute nearly 75% of total higher education enrolments in the SADC region. Normalising these enrolment figures by 100 000 of the population shows that South Africa has the highest rate (1.6 enrolments per 100 000 of the population, followed by Mauritius (1.5). All the other countries are below 1 per 100 000 of the population with Angola, Mozambique and Tanzania recording the lowest enrolment rates. See Chapter 4:224.
Table 5  Regional higher education institutions and overall enrolments

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of public universities</th>
<th>Publicly funded polytechnics/ specialised colleges</th>
<th>Number of private universities or colleges</th>
<th>Total enrolment public higher education (most recent year per institution)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>1</td>
<td>47 373</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botswana</td>
<td>1</td>
<td>21 5 15 710</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRC</td>
<td>4</td>
<td>31 478</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>1</td>
<td>7 0 8 508</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madagascar</td>
<td>6</td>
<td>2 21 41 691</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malawi</td>
<td>2</td>
<td>7 4 7 869</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mauritius</td>
<td>2</td>
<td>7 30 9 720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozambique</td>
<td>4</td>
<td>3 12 46 865</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namibia</td>
<td>1</td>
<td>2 2 8 378</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>23</td>
<td>79* 746 538</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swaziland</td>
<td>1</td>
<td>1 4 5 785</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanzania</td>
<td>8</td>
<td>13 12 33 420</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>3</td>
<td>43 6 14 395</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>9</td>
<td>8 4 52 453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SADC total</td>
<td>66</td>
<td>114 170 1 070 183</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Chapter 2:71-73

* Sourced from the Department of Education’s Register of Private Higher Education Institutions (21 January 2009)

SADC higher education is currently predominantly based on contact provision, although, in principle, distance education has the potential to increase higher education access and participation. Of all students enrolled in SADC public higher education, 72% are contact students, while some countries provide no distance higher education (Angola, DRC, Lesotho, Malawi and Mauritius).

Enrolments are also characterised by inequity. The SARUA study of funding frameworks cites three important determinants of inequity in higher education enrolments: gender (to the disadvantage of women), socio-economic status (to the disadvantage of low-income groups) and region (to the disadvantage of rural areas). Female participation rates in Sub-Saharan Africa were at 4% in 2005 (compared to 16% in developing countries and 74% in developed countries). According to SARUA baseline data, gender distribution in SADC higher education enrolments, across all countries, is 50.1% male and 49.9% female; however, these figures shift to 63.2% male and 36.8% female when South African data are excluded. Gender enrolment disparities are evident in certain major fields of study.

24 See Chapter 5:316 (Table 1) and 334 (Table 9) for a comparative compilation of SADC public institutions and enrolments in 2004.
Male to female student ratios (data rounded off) are:

- 63:37 for science, engineering and technology (72:28 excluding South Africa);
- 49:51 for business, management and law (60:40 excluding South Africa);
- 45:55 for humanities and social sciences (59:41 excluding South Africa); and
- 45:55 for health sciences (58:42 excluding South Africa).

Enrolments are skewed by field of study (see Figure 2). This set of SARUA baseline study data shows that most SADC higher education students are enrolled in the humanities and social sciences (38,4%); business, management and law represent 31,8% of student numbers; science, engineering and technology represent 22,2%; and health sciences represent just under 7,0% (leaving just over 0,5% enrolled in other fields of study). Low health sciences enrolments are cause for concern, given the challenges of poverty and disease facing the region. South African institutions currently enrol 70% of the region’s total health sciences students (the next highest enrolments being DRC 17,7%; Tanzania 5,4%; Zimbabwe 4,2%; and Madagascar 3,6%). Science and technology enrolments are also much lower than desirable and are similarly concentrated in particular countries (the three highest enrolments being South Africa 72%; Mozambique 5%; and Zimbabwe 4,5%).

Figure 2  Headcount students by major field of study (all levels of study)

Enrolments are skewed by level of study. According to SARUA baseline study data, the majority of SADC higher education students are registered for undergraduate degrees and diplomas (83,5%). At postgraduate level, 5,5% of students are enrolled for postgraduate diplomas, 5,4% for master’s degrees, and 1,0% for doctoral degrees (leaving 4,6% registered at other levels of study). When data for South Africa are excluded, the percentages do not shift significantly, although the percentage of students enrolled for doctoral degrees drops to 0,2%.
2.7 Higher education outputs

In the SARUA baseline research, SADC higher education qualifications data demonstrate very similar patterns to enrolment data in terms of the fields of study for which qualifications are awarded (40% in the humanities and social sciences) and undergraduate (74%) versus postgraduate qualifications (see Table 6).

Table 6  Regional overview of qualifications awarded (all countries, most recent year for which data were available)

<table>
<thead>
<tr>
<th>Major field of study</th>
<th>Qualifications awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Science, engineering and technology</td>
<td>39 389</td>
</tr>
<tr>
<td>Business, management and law</td>
<td>51 729</td>
</tr>
<tr>
<td>Humanities and social sciences</td>
<td>69 729</td>
</tr>
<tr>
<td>Health sciences</td>
<td>13 507</td>
</tr>
<tr>
<td>Other</td>
<td>5 910</td>
</tr>
<tr>
<td>Total</td>
<td>180 264</td>
</tr>
</tbody>
</table>

Source: Chapter 2:93

As enrolment data do not differentiate the year of study of students, throughput rates could not be calculated by the SARUA baseline study. However, comparison of total enrolment numbers in the most recent year for which data were available with the number of qualifications awarded in the most recent year for which data were available suggests that throughput rates are low.

25 See Chapter 2:88-94. Also see Chapter 4:265 (Table 25) for some analysis of graduates in 2004 by field of study – mainly for the purpose of highlighting science and technology graduates.
2.8 Public science outputs and focus

The SARUA research confirms that SADC public science systems, including their public higher education component, demonstrate significant capacity constraints and a need for investment in capacity development.

Africa’s share of world science, as measured in papers published in the citation indexes of the Institute for Scientific Information (ISI) has been declining steadily over the past decade. Bibliometric studies show that Sub-Saharan Africa’s share of world scientific papers declined from 1% in 1987 to 0.7% in 1996, outpaced by the worldwide growth rate in research. Thus Africa has lost 11% of its share in global science since its peak in 1987; Sub-Saharan science has lost almost a third (31%). North African countries (Egypt, Algeria, Mauritania, Libya, Morocco and Tunisia) accounted for modest growth of the African share of the worldwide output during the years 1998 to 2002. Countries in the south have generally done worse as their research infrastructure, libraries and funding have deteriorated.

With the exception of some encouragingly robust universities and research centres, SADC countries show few of the features of modern science systems (i.e. research and development bodies inside and outside higher education, scientific publishing houses, journals, conferences, technology incubators, technology transfer offices and patenting offices). Instead, SADC science and technology systems are in ‘subsistence mode’: struggling to reproduce themselves, limited to own-use knowledge and exporting little knowledge.

South Africa is the most prolific and productive producer of scientific output in the region, dominating scientific production by producing on average 80% of all output for the period 1990 to 2007 and being about four times more productive than the average for the region (119 scientific papers per million of the population compared to the average of 29 papers per million of the population). Tanzania is currently the second most prolific (having pushed Zimbabwe into third position in the past five years). Botswana is the second most productive (96 papers per million of the population), with Mauritius and Namibia also showing above-average productivity scores. Countries that are ‘doing better’ (i.e. that have more than doubled their output in the period) are Botswana, Madagascar, Malawi, Mauritius, Mozambique, Namibia and Tanzania. Those that have remained steady or ‘done worse’ are Angola, DRC, Lesotho, South Africa, Swaziland and Zimbabwe.

26 See Chapter 4:199-200, 202, 208, Section 1.1.1, Section 1.1.3, Section 1.4; Chapter 2:78-80; Chapter 5:343-344.
Figure 3  Scientific output in the SADC region 1990 to 2007, as per Institute for Scientific Information Web of Science Database (excluding South Africa)

Source: Chapter 4:202,227

Figure 4  Scientific output in the SADC region by six-year window 1990 to 2007, as per Institute for Scientific Information Web of Science Database (excluding South Africa)

Source: Chapter 4:228
SADC scientists and scholars appreciate that publishing in foreign and/or peer-reviewed journals is desirable. However, they are hampered by such factors as lack of funding, lack of equipment for reliable experimental results, lack of scientific writing skills, linguistic dominance of English in international scientific publishing, and lack of a culture of publishing. These constraints force many to publish in local/non-peer-reviewed journals because the pressure to publish is a pervasive criterion in all performance appraisal systems. Yet even here limiting factors come into play, e.g. perceived unfair competition for local journals.

The focus of scientific output in the region is dominated by research into the biodiversity of ecosystems (South Africa) and medical research in the areas of public health, infectious and tropical diseases and veterinary medicine (other SADC countries). Other important focuses emerging from the SARUA study are social cohesion, regional history, democracy and citizenship.

The total number of annual research publications reported by surveyed public higher education institutions (in the most recent year for which data were available) is 13,609; the total for internationally accredited journal articles is 4,608. These figures drop to 3,907 and 1,045 respectively when South African data are excluded.

Many public higher education institutions in the region acknowledge their limitations in respect of research capacity and quality graduate study programmes. On the positive side, 59% of SARUA member institutions reported that they have research policies and/or strategies in place. The SARUA study of university-firm interaction cited an encouraging picture of the foundation for building university research systems for those SADC universities in its sample: the majority reported research policies and/or strategies, as well as research offices. However, few had policies for intellectual property rights or organisational structures (e.g. a technology transfer office) to support interaction with firms, or commercialisation of university research.

A 2007 SARUA status review of information and communication technology/ies in SADC universities found little evidence of information and communication technology/ies being used for advanced research. Research was being hampered by the bandwidth available to institutions, which was assessed as “too little, too expensive and not well managed” and as lagging far behind peer institutions in the developed, and even other parts of the developing world. More hopefully, the average amount of bandwidth per university appeared to be increasing year on year. Also, plans are being developed actively and collaboratively to establish and deploy a regional research and educational network (a Southern Cluster of the Ubuntunet Alliance) to the benefit of SADC countries (Chapter 3).
2.9 Scientific, research and academic staffing capacity

The SARUA research cited a range of background factors that currently constrain scientific, research and academic staffing capacity in Southern African science and technology and higher education.

General constraints identified in public science were:

- A brain drain: In SARUA’s public science study nearly a quarter of respondents from SADC countries other than South Africa indicated that they are considering moving to another country.
- Related to this, student ‘flight’ for postgraduate study: Students move mostly from other SADC countries to South Africa, although the data show encouraging increases in non-South African honours (+2%), master’s (+10%) and doctoral (+14%) graduates between 2000 and 2005. Some top universities, such as the University of Dar es Salaam, the University of Botswana and Agostinho Neto University in Angola, are introducing postgraduate programmes to counteract flight.
- Research/academic consultancy: Whether linked to research interests, or as a strategy to counter low academic salaries in many SADC countries, this trend is often viewed as weakening the fragile base of many scientific institutions.

Specific constraints identified in higher education include overlapping and other factors:

- There are ‘generational differences’ amongst academic staff. Those educated in the 1960s benefited from study at newly created African institutions with relatively greater available funding and opportunities for overseas study. Those educated in the 1970s and 1980s were affected by deterioration in teaching and research conditions related to economic constraints. Those educated from the mid-1980s onward have faced the brunt of Africa’s declining higher education environment and so have tended to qualify at a lower level.
- Academic salaries tend to perform poorly when compared to salaries of graduate professionals in the private sector.
- Brain drain is a significant factor when, in a global market for advanced human capital, many African countries and universities find it increasingly difficult to provide the working conditions for academics and researchers that are offered in other countries.
- Southern African academics turn to consultancy and private work to supplement their incomes, further reducing available institutional capacity.

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27 See Chapter 4.202-203, Section 1.1.2, Section 1.3.2, Section 1.3.3, Chapter 2.94-104; Chapter 5.332.
28 Statistics on brain drain from SADC - and on ‘internal brain drain’ from other SADC countries to South Africa - are difficult to assemble. A 2007 SARUA study noted: “We could only find quantitative data on brain drain statistics in four of our country studies: Botswana, Mauritius, South Africa and Zimbabwe. Even where such figures are found, they are rather impressionistic and possibly unreliable. … Countries in Africa do not keep good statistics on emigration and immigration flows. Most statistical agencies also do not have disaggregated data by professional category for emigrating citizens. It would require a separate and huge effort to properly map brain circulation patterns and trends within the region and external to the region.” An International Council for Science (ICSU) project around brain drain in Africa should start to assist gaps in the data. See Chapter 4.
29 Some would argue a alternative view viz. that consultancy oriented around products and services nevertheless provides constructive opportunities for research.
‘Tied aid’ conditions of donor-funded development projects, which insist that project expertise be provided by the donor country, deny professional development opportunities to academic staff in the SADC region.

Although 75% of SARUA member public higher education institutions reported having both internal and external mechanisms in place for staff development, there is much individual variation in approach, making it difficult to draw conclusions as to the quality and efficacy of staff development efforts.

The SARUA public science study encountered difficulties in measuring the size of SADC’s research workforce, given paucity of reliable data. However, its marshalling of the data (see Chapter 4:223, Table 4) suggests wide variation across countries, with the majority recording fewer than 50 full-time equivalent researchers per million of the population. The SARUA study of university-firm interaction confirmed this reading, as well as the difficulty of collecting data to assess the capacity of the SADC science and technology system (see Chapter 5:332, Table 8).

According to the SARUA baseline research, the highest numbers of academic and research staff in SADC public higher education institutions are employed in the science, engineering and technology field of study (10 336)\(^{30}\) and in the humanities and social sciences (9 941); these fields show almost double the numbers of staff of business, management and law (5 804) and health sciences (5 437). However, institutions tend to cite staff shortages in all areas with the least urgency of shortage in humanities and social sciences (see Table 7).

Table 7  Summary of higher education academic and research staff patterns (all countries, most recent year for which data were available)

<table>
<thead>
<tr>
<th>Major field of study</th>
<th>Total academic and research staff</th>
<th>Gender breakdown</th>
<th>Staff qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Female (%)</td>
<td>Male (%)</td>
</tr>
<tr>
<td>Science, engineering and technology</td>
<td>10 336 (4 598*)</td>
<td>25,2 (17,2)</td>
<td>74,8 (82,8)</td>
</tr>
<tr>
<td>Business, management and law</td>
<td>5 804 (1 892)</td>
<td>34,8 (19,5)</td>
<td>65,2 (80,6)</td>
</tr>
<tr>
<td>Humanities and social sciences</td>
<td>9 941 (4 933)</td>
<td>38,3 (23,6)</td>
<td>61,7 (76,4)</td>
</tr>
</tbody>
</table>

\(^{30}\) This finding that the highest numbers of academic staff are to be found in this field apparently contradicts the common complaint that there are too few academics in this field, especially given relatively low enrolments. Further interrogation is indicated, although it can be noted that this study classified agriculture under the science, engineering and technology category.
A comparison of total numbers of students enrolled in each major field of study with the total number of academic and research staff reveals ratios of approximately 23 students per staff member in science, engineering and technology; 61 students per staff member in business, management and law; 42 students per staff member in humanities and social sciences; and 14 students per staff member in health sciences.

Most academic and research staff members have postgraduate qualifications (84%), with 8 660 having master’s degree qualifications and 8 441 having doctoral degree qualifications. However, what is unclear from the data provided by the SARUA baseline study is the extent to which these numbers include ageing academics soon to retire, a phenomenon being experienced globally. Against this background, a relatively low student enrolment in postgraduate studies gives much cause for concern. Furthermore, while it is known that approximately 31% of all South African academics in permanent positions currently have a doctorate, no data are available on the proportion of staff with master’s and doctoral qualifications in the other SADC countries.

Throughout the region, gender disparities between male and female academic and research staff are evident across the board. The exception is in South Africa, where a trend towards gender parity is evident at junior lecturer level, although even here gender disparities remain pronounced at senior academic level.

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31 Also see Chapter 4:225 (Table 5). "One should, theoretically, be able to calculate the student/teacher ratio from these figures. However, we are not convinced that the numbers in all cases reflect (permanent) academic staff only."
2.10 Higher education quality assurance

It was noted at the start of this analysis that quality assurance arrangements are uneven at both system and institutional levels of SADC higher education. It would also appear that they are not necessarily well capacitated. While 78% of SARUA member institutions report internal quality assurance systems and/or processes in place, only 48% cite specific institutional budget for quality assurance purposes. Also according to the survey of SARUA member institutions:

- 64% participate in peer review processes;
- 78% conduct internal review of academic programmes;
- 67% conduct evaluation of teaching staff;
- 75% seek student feedback on academic issues, student services and (in about 60% of those cases) institutional governance; and
- 19% of institutions indicate that they do not use external moderators for examinations (another 17% did not provide information on this issue).

See Figure 5 for an indication of areas covered by institutional quality assurance frameworks.

Figure 5  Areas included in institutional quality assurance frameworks
2.11 Regional scientific and higher education co-operation and collaboration

While the importance of co-operation and collaboration in SADC public science and higher education is acknowledged in principle by governments and institutions in the region, it is clear that the practice of regional co-operation and collaboration in science and higher education requires a great deal of strengthening.

In public science as a whole, the SARUA research provides strong evidence for collaboration in most fields, but collaboration with other institutions in the region is negligible and is far exceeded by collaboration with other countries, mostly in the north. This may be as a result of established networks and donor funding. South African scientists and scholars are involved in fewer joint activities across the spectrum of research activities than their counterparts in other SADC countries. This is possibly because the latter are more reliant on overseas funding.

Scientific networking occurs in many forums for scientists in the region, especially through scientific societies and conferences. However, funding constraints limit scientific networking activities. In the SARUA public science study, a third of respondents outside South Africa indicated that they are currently not a member of any scientific society/academy of science, and 12% of this group reported that they did not attend any conference in an average year.

In higher education specifically, only eight ministries (of eleven responding) reported that regional development priorities influenced national higher education planning. This is a disturbing finding given that congruent regional and national higher education planning is fundamental to cross-regional improvements.

Student and staff mobility patterns provide a clue to the nature of higher education co-operation in the region. According to SARUA baseline research data from the most recent year available, most movement of higher education staff and students is from other SADC countries to South Africa. South Africa enrols 35,745 headcount students from other SADC countries (more than double the number of other international students enrolled in South Africa). Headcount enrolments from fellow SADC countries are significantly lower in other national higher education sectors: Namibia (700), Madagascar (537), Botswana (136), Zimbabwe (120) and Swaziland (108) are next in line, with all other SADC countries enrolling fewer than 50. South Africa reports 466 SADC citizens as staff members, with the next highest being Namibia, Swaziland and Zambia (47, 46 and 6 SADC staff respectively), while

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33 See Chapter 4:206-207, Section 1.3.4, Section 1.3.5, Chapter 2:113-119.
34 SARUA’s public science study provides data for the international flow of students in 2004. This shows countries with the highest outbound mobility rates in the region as: Lesotho (74%), Botswana (72%), Namibia (58%), Angola (46%), Mauritius (41%), Swaziland (32%) and Zimbabwe (30%). Students from Angola tend to go and study in Portugal. Students from Mauritius study in France as first preference. In both cases, South Africa is the second preferred destination. For the other countries on this list, South Africa is the first choice. This is also reflected in South Africa’s inbound mobility numbers. See Chapter 4:262 (Table 23). Also see a discussion in Chapter 5:334-335.
other countries report 0 to 2 staff members from other SADC countries. In all SADC countries, more international staff members come from non-SADC than from SADC countries.

Some SADC countries require students from other SADC countries to obtain student visas, although this is not generally viewed as problematic. More problematic appears to be the fact that several countries still charge higher fees for SADC students despite the provisions for equal treatment of students from SADC countries agreed to in the Protocol (Article 7(A)5). Only in Swaziland, South Africa and Zambia do SADC students pay the same fees as national students.

Almost 63% of SARUA member public higher education institutions can provide examples of collaborative academic and/or research work. As examples, Namibian students complete pre-engineering courses in Namibia and then complete their qualifications in South Africa; the Faculty of Engineering at the University of Botswana administers a Project Management Programme in partnership with the University of Dar es Salaam; Lupane State University in Zimbabwe facilitates leave for staff exchanges with any SADC university of the staff member’s choice, and in some instances memoranda of agreement have been signed. However, a greater number of collaborative initiatives tend to be with countries outside of SADC.

Challenges identified for regional collaboration in SADC higher education include:

- lack of funding and resources for effective systemic collaboration;
- lack of systematically generated and centrally stored higher education data;
- lack of concrete strategies to operationalise collaboration envisaged by the Protocol; and
- regional asymmetries (e.g. South Africa has relatively stronger integration into global markets than other SADC countries).

Against this backdrop, even existing regional collaboration efforts tend to be ad hoc in nature.

2.12 Collaboration between higher education and industry

Little has been known about the nature, forms, focus, scale, extent, outcomes and benefits of interaction between SADC universities and private firms, or about the factors that enable or inhibit such interaction. According to the SARUA baseline research, 58% of SADC public higher education institutions can provide examples of collaborative community development programmes, 41% can provide examples of collaborative projects with business and industry, while 59% of SARUA member institutions have plans in place for collaboration with industry. The SARUA study dedicated to investigating university-firm interactions has obviously provided a much more textured picture

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35 See Chapter 5; Chapter 2:80,117.
of collaboration between SADC higher education and industry. Further information in this section is
drawn from that study, noting that its survey included 41 universities in 13 SADC countries (excluding
South Africa) and yielded a usable data sample of 22 institutions.\footnote{For explanation, see Chapter 5:321-324.}

The study finds a positive propensity and orientation on the part of SADC universities towards
research, innovation and interaction with firms. However, in practice, interaction exists primarily in
isolated instances or on a small scale.

The most common form of university collaboration is with other local universities, with isolated cases
of collaboration with other Sub-Saharan African and foreign universities. The second most common
form of collaboration is with public research institutions. Interactions with private research institutions,
Sub-Saharan African academic associations and NEPAD science and technology initiatives are
extremely isolated. The pattern of ranking of importance of university collaboration partners reflects
the same preferences.

Collaboration between universities and public and development organisations is on a moderate
scale in respect of national and regional government, community organisations and local non-
governmental organisations. Interaction with agricultural organisations is low.

The existence of all forms of university-firm interaction is low, but those that are more common include
the education of work-ready students and consultancy. In contrast, most forms of firm interaction are held
to be moderately to very important – especially donations, sponsorship, consultancy, technical evaluation
and research and development-focused interactions. Two potentially critical areas of interaction – software
development and agricultural services – are, however, ranked much lower in importance.

Also, in terms of innovation, the picture is bleak: 60% of the sample reported no involvement with
technology transfer, 40% are not involved with research and development for firm innovation, and
52% were not involved in software development or design.

Channels of interaction with firms that SADC universities rate as very or moderately important
include: public conferences and meetings, recent graduates hired by firms, publications and reports
in the public domain, individual consultancy, research and development co-operative projects and
informal information exchange. Channels regarded as less important are those related to the new
commercialisation role of universities in the developed world – patents, technology incubators, spin-
off firms, licensed technology and science or technology parks.

Similarly, the more traditional university products are rated as the important outcomes of interaction
with firms: human resource development, graduates, publications, new research projects and
dissertations. Few products that contribute to the firm or to innovation (patents, software, design, spin-offs) are regarded as important.

Three groups of SADC universities, based on the scale of their interaction with firms and their institutional profile, were distinguished by the study:

- A first group comprises relatively new, medium to large universities that have a moderate scale of interaction with firms.
- The second group is made up of established, large and more traditional universities and very new, small universities with a technology/entrepreneurial orientation; both kinds have a small scale of interaction with firms.
- Third is a group of small, established, new and technology-oriented universities that have isolated incidences of interaction.37

Potential benefits of university-firm interaction viewed as important by universities include: knowledge and reputation-related benefits, financial benefits, and new economic roles for universities. Obstacles to interaction prioritised by universities include: lack of mutual understanding between universities and firms of the other's activities and potential, inadequate research capacity and infrastructure, and the dominance of foreign-driven research agendas. Further critical obstacles are less easily identified by universities; these include: issues associated with intellectual property rights, and the geographic location of universities in relation to centres of economic activity.

Initiating interaction with firms tends to be an individual endeavour left up to the academic rather than university-driven, especially as universities have few internal and external interface structures to support and facilitate innovation. Firms initiate the interaction in about 30% of cases, and the initiative is shared in about 45% of cases. The role of university graduates as a link between universities and firms is small, but potentially significant.

South Africa is something of a special case in SADC insofar as university-firm interaction is concerned, demonstrating a far larger scale and variety of forms of interaction. In 2005, 51.7% of South African firms engaged in innovation, with higher education institutions as partners in 15.5% of cases (equating to 120 firms involved in collaboration with universities). An estimated 8% of all South African firms, 15% of innovative firms, and 37% of research and development-performing firms collaborate with universities. Forms of interaction include donations, sponsorships, consultancies, contracts, design solutions, commercialisation and interactions (including collaborative networks) stimulated by government-funded incentives. As with universities in the rest of SADC, South African institutions’ interaction with firms is influenced by their history and mission.38

37 The individual universities in question are named and profiled in Chapter 5:Part 5.
38 Discussed and profiled in Chapter 5:Part 5.3.
Part 3: Areas for action arising from the research

Taken as a whole, the SARUA research findings identify the key drivers that are likely to influence priorities for the revitalisation of Southern African higher education. In many cases, the studies identify recommendations or possibilities for action. All of these could serve to inform policy and programme briefs for SARUA and its membership, as well as continued interactions with other actors.

3.1 Governance and leadership

Improvements are needed in higher education system and institutional governance. The SARUA research highlights challenges in the following areas:

- co-ordination and integration of national education policies and goals and regional developmental priorities;
- policy frameworks, institutional support and incentives for science and technology systems;
- planning, application and monitoring of higher education funding;
- institutionalisation of national quality assurance systems; and
- higher education data collection and management of information systems.

These gaps and challenges are often mirrored at university level, for example in the absence of research management and quality assurance capacities.

Leadership development (in the broadest sense of the term) will be a priority to address these challenges. Yet if higher education is to contribute to regional development, this perspective will be vital. It will require the development of a vision for higher education leadership in the region, involving engagement between institutions, regional and national associations, and education ministries.

Taking into account the historical and other conditions facing SADC countries and their higher education institutions, and the debates around collegial vs managerial approaches to university leadership, it will be important for a facilitative agency such as SARUA to contribute to a new discourse.

39 The variable level of detail in the material as collected here from the different reports – or as inferred from them, where no specific source is indicated – should be taken as an indication of variation in the substance and organisation of the source material, and not as indicative of the relative importance of issues. No attempt is made here to prioritise issues that are instead ordered more or less according to the order in which the ‘key data and themes’ were presented in the previous section.
around approaches to governance, leadership and management that are appropriate from a southern perspective. This suggests the following potential roles for SARUA:

• developing a regional perspective on higher education;
• providing platforms for interaction and exchange around leadership issues that will have regional impact while maintaining sensitivity towards national/local cultures and practices;
• developing links with other organisations that can add value to a regional focus on higher education leadership issues, e.g. the Association of African Universities and Southern African Research and Information Management Association;
• focusing on top-level capacity-development initiatives; and
• acting as a funding channel for capacity development by seeking to obtain multilateral co-operative funding, which can be used in development projects.

3.2 Higher education financing

The SARUA study of funding frameworks established that higher education financing in the SADC region is generally characterised by features of inadequacy, inequity, inefficiency, poor oversight and poor integration with planning. However, good practices were also identified, and the potential exists for these to be further developed. They include public-private partnerships, differentiated public funding, and the introduction of forms of cost-sharing, loan schemes and funding formulas.

Through information and advocacy, SARUA can play a role in assisting education ministries to reconceptualise the role that higher education can play in national development (political, economic, social and cultural) and in relation to regional development priorities. Good-practice models can be identified to inform the policies and practices of national governments and their interactions and consultations around higher education financing with institutions and potential partners in the private sector.

3.3 Higher education enrolments

Strategies for increasing enrolments in science, engineering and technology, and in health sciences, are essential to meet regional developmental needs. Enrolment strategies in these fields need to address many fronts, including:

• attracting more young women into science and technology enrolment;
• preparation of students at other levels of the education system;
• improved opportunities for postgraduate study to grow the regional expertise and research base;
• understanding staffing patterns and resolving critical staff shortages;
• developing cross-border education opportunities and regional centres of excellence; and
• expansion of the funding base for these fields.
3.4 Research capacity development

Research capacity development is a major need in the SADC region, including aspects of governance, research management, funding, and scientific, academic and research staff capacity development. Various bodies, both international and African, are already involved in promoting research in the SADC region, and this is an important starting point.

SARUA could support these efforts by commissioning further research to map existing actors and initiatives in regional research capacity development. In addition, SARUA could convene a meeting with key stakeholders (decision-makers, researchers and possibly donor agencies) to strategise ways in which the case for science can be made and effectively advocated. In this respect modalities include:

- identifying and profiling case studies that demonstrate the value of science in the region, in Africa and in developing countries elsewhere in the world;
- driving communication initiatives that highlight for various constituencies the impact of science in different developmental fields;
- identifying and developing mechanisms for collaborating with regional and international bodies that have complementary aims; and
- commissioning studies to illustrate the tradition and legacy of significant research institutions in the region and their socio-economic contributions (e.g. the Onderstepoort Institute for Veterinary Sciences in South Africa, the Pasteur Institute in Madagascar, the Tea Institute in Malawi and the Mauritius Sugar Industry Research Institute).

Other key focal points for intervention that SARUA could support include:

- Increasing intra-regional research collaboration. This would have a positive impact on strengthening regional institutions and would leverage significant commonalities in scientific priorities (e.g. in environmental diversity, infectious diseases, democracy and citizenship). Mechanisms for the improvement of intra-regional scientific collaboration, especially amongst university researchers, include strengthening scientific journals, regional networking, and the development of a regional knowledge base of scientific projects and scholars working in SADC. SARUA could consider supporting the establishment of one or two high quality regional journals in consultation with others such as the Academy of Science of South Africa (currently involved in such a venture) and African Journals Online. Initiatives that strengthen the quality and editorial management of existing regional journals would also be of value.
- Research funding must be boosted to overcome current constraints. Here strategies include embarking on an advocacy and lobbying campaign to persuade national governments to commit to allocating 1% of gross domestic product to research and development, assistance to universities in the region to gain access to international funding sources (e.g. through services such as Research

Africa), and programmes to build researchers’ capacity for developing funding proposals so as to increase their rate of success when applying for overseas funding.

- Institutional research management is generally deficient, meaning that crucial functions (gathering research and postgraduate statistics, developing and implementing research capacity-building programmes, advising on matters related to the integrity of research, intellectual property and knowledge transfer) are neglected. Strengthening the research management capacity of universities and other regional research organisations is a key capacity development priority.

- Developing a critical mass in research infrastructure and capacity, and areas of national and regional research strength, can be substantially built through regional collaboration and centres of excellence – especially as universities in the region already favour collaboration with local counterparts.

- Postgraduate students should be encouraged to remain in the region, rather than seeking study and research opportunities elsewhere in the world. Using its communications channels, SARUA could provide SADC students with information on doctoral programmes offered in the region. SARUA could also become involved in existing regional initiatives that aim to prepare postgraduate students for doctoral studies41 and conduct workshops for academics in the effective design and implementation of new doctoral programmes.

3.5 Regional data gathering and management42

The research findings demonstrate that there are different conventions regarding data collection at national levels. Furthermore, SADC member countries and their public higher education institutions have achieved varying levels of sophistication with respect to data collection and management.

The production of reliable shared data would promote integrated regional and higher education development in the SADC region, but depends on finding the appropriate means to tackle current data collection and management practices and challenges at both national and regional levels. This will be essential in processes leading to the construction and maintenance of a regional database.

As an example of the importance of high-quality data, the SARUA public science study noted that reliable measurement of the ratio of gross expenditure on research and development to GDP is critical for the governance, funding and development of science and technology in the SADC region. Additional key areas of information are: research and development income and expenditure trends, and the contributions to research and development by various sectors (higher education, public, private).

41 E.g. in South Africa, the African Institute for Mathematical Sciences and African Doctoral Academy Initiative at the University of Stellenbosch, and the Human Rights Programme at the University of Pretoria.

42 See Chapter 2:66-67; Chapter 4:200-202.
3.6 University-firm interaction

The SARUA analysis of SADC university-firm interaction highlights the possibility of building on and amplifying practices of engagement where these exist in SADC countries. However, the study also urges caution and appropriate action in relation to the models of engagement adopted. Higher education institutions should be cautious, for example, about adopting an ‘entrepreneurial’ model or commercialisation practices, given that existing capacity for patenting, intellectual property rights and commercialisation is extremely low in the region. Even in the comparatively stronger case of South Africa, success has been limited.

Higher education systems in the SADC countries should preferably adopt a differentiated strategy for interventions that promote university-firm interaction. This includes taking into account distinct historical trajectories and capacities of individual universities and working towards variation and balance across the higher education system.

SADC universities would also be wise to pursue curriculum restructuring across all disciplines (not only science and technology). It is important to ensure curriculum responsiveness to the demands of the global knowledge economy and local development, as well as to the needs of graduates, local firms and national human resource development needs.

Southern African national higher education systems and their universities should build research capability in selected niche areas informed by local economic development needs.

The pursuit of university-industry relationships (such as the pursuit of consultancies and contracts) needs to be supported by institution-level strategies and mechanisms regulated by a university contracts office. This is necessary to ensure that these engagements have institutional rather than purely individual benefit, and that they lay the foundation for longer-term, productive university-firm collaboration.

Closer engagement with local economic development needs would be boosted by Southern African national higher education systems and their universities building research capability in relevant niche areas.

It will be important for higher education institutions to pursue strategies for increased knowledge sharing between universities and firms – including mutual understandings of one another’s activities and needs. Approaches could include: university-industry forums for knowledge exchange and coherent university-firm strategies and interface structures.

SARUA’s role in promoting university-firm interaction could include:

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43 See Chapter 5.306-310.
• investigating the most efficient mechanisms to build collaborative research networks between groups of neighbouring countries and across the region, to create regional centres of excellence and regional technology platforms;
• advocating and convening mechanisms to promote knowledge exchange between universities and firms; and
• developing a regional network to extend and deepen research to support university-firm interaction.

3.7 Further areas of knowledge exploration

In addition to the areas for action identified above, the following areas of further research can be identified within the ambit of SARUA’s programme:

• Strategies and approaches for updating regional frameworks for higher education development and ensuring greater sophistication of national policy frameworks for integration of higher education development with regional development.

• Advocate the development of a reliable shared data in the form of a regional database.

• Developing a regional perspective and framework on the place of community service/engagement as a core higher education function in Southern Africa.

• Developing a better understanding of the role, size and influence of private higher education provision in SADC higher education.

• Full investigation and mapping of actors and initiatives currently involved in research capacity development in the SADC region. While it is known that these include a wide spectrum of development bodies and agencies, international funding agencies and data-gathering agencies, no central study or database of this information exists.

• Developing a perspective on systemic strategies and resources for regional co-operation and collaboration in research and cross-border education.

• Developing a deeper understanding of the ‘national system of innovation’ (whatever its relative status may be) and of the levels of economic and technological development in key sectors in each SADC country, especially in order to map potential for interaction between particular universities, academic disciplines and industrial sectors.
Conclusion

This thematic analysis makes the case for a concerted and collaborative drive by countries in the SADC region for higher education renewal as a crucial component of accelerated regional development. Drawing on the key findings from the baseline data and research on the current status of regional higher education, it identifies the strengths and weaknesses currently at work, and the opportunities for revitalising higher education institutions in service of national and regional development. By way of conclusion, this final section highlights cross-cutting and underpinning observations that emerge from the research as essential considerations for implementing the revitalisation agenda.

First and foremost, it can never be forgotten that the regional context defines the nature of the overall developmental challenge for SADC and therefore the nature of the socio-economic contribution that higher education can make. Global pressures cannot be ignored, and in many cases they provide a necessary spur to action. However, the models and methods adopted by countries and higher education systems outside the bounds of Southern Africa may not always be the best choices for those within them. Appreciation for the Southern African context and its history must inform the specific strategies and emphases pursued for higher education revitalisation by regional and national higher education systems, by higher education institutions and research institutes, and by partners in the endeavour: governments, public and private sectors, donors and international development agencies.

The revitalisation and capacity-development needs of SADC higher education are intensive and comprehensive. The scope of the renewal endeavour encompasses higher education, research and development and science and technology system development; financing development; policy development; leadership development; human capital development; network development; infrastructure development; expansion of access and equity; strengthening of data systems, data collection and information dissemination – and this is far from an exhaustive list. The need for multi-partner focus and action across many fronts is self-evident.

A weak existing higher education and science and technology policy base in many SADC countries, combined with the powerful role often played by external drivers (e.g. the research agendas of external funders, intensifying ‘demands’ of the global knowledge economy) can ultimately serve further to weaken higher education by triggering ‘symbolic’ policy responses or over-ambitious projects that do not synchronise with national and regional development trajectories. This risk underscores the need for developmental strategies and initiatives that are coherently and realistically generated and implemented by various partners.

Many of the dominant themes in the litany of what is required for higher education development are recurrent themes that have persisted over many decades. As selected examples:

- Governance, leadership and management remain areas of weakness across all SADC higher education systems despite repeated efforts to address them. Substantive, responsive interventions designed for long-term systemic impact are required.
• Financing has been chronically inadequate and is completely insufficient given the nature of the higher education/science and technology developmental challenge. Multi-faceted attention is required with regard to the quantum of public finance available, the kind of public financing mechanisms used, the ways in which these are applied and/or (mis)managed, and alternative financing strategies and sources.

• Brain drain, including internal brain drain from other SADC countries to South Africa, is a phenomenon that must be reversed if regional efforts for higher education development are to yield incremental results rather than Sisyphean endeavour. Highly visible and tireless advocacy of higher education’s role in regional and national upliftment will be indispensable to the realisation of this goal, as is the role that each country’s academics, researchers and individual skilled citizens can play.

Thus, there is an urgent need for innovative thinking, co-ordinated forms of policy and programme support and visible action. While the forms that policy and action may take are broadly known (regional policy frameworks and initiatives, best-practice models, centres of excellence for research and study, exchange, ‘shadowing’ and mentoring initiatives), definitive substance has to be given to these as a matter of urgency if accelerated higher education development is to be a reality in Southern Africa within the next few years.
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