

## *Chapter 8*

### *Research universities in Africa?*

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The main findings of the second phase of the HERANA project provided empirical support for Castells's assertion that the focus of African universities had historically been on elite formation and training, and that 'research production at seven of the eight (UCT excluded) was not strong enough to enable them to build on their traditional undergraduate teaching roles to make a sustainable, comprehensive contribution to development via new knowledge production' (Cloete et al. 2011: 165). HERANA Phase 2 also concluded that in none of the countries was there a coordinated effort between government, external stakeholders and the universities to systematically strengthen the contribution that higher education can make to development (Cloete et al. 2011).

This chapter continues the thread from HERANA Phase 2 but focuses more specifically on findings from the third phase of the HERANA project, specifically on knowledge *production* and the ambitions of African universities to become research-intensive universities.

### *The need for research universities in Africa*

Internationally, there is growing consensus among national policy-makers and other central socio-economic actors that the university is a driver for economic growth and development. This has to do

with the role of the university in producing a highly skilled and competent labour force, as well as in producing new knowledge. Both contributions are essential to the creation of innovation and development of a national economy that is globally competitive. This position is well summed up by Olsson and Cooke in an OECD/IHERD report:

Top research universities in industrialised countries [...] usually dominate the global ranking tables. In contrast, their counterparts in middle and low-income countries have, if anything, more important missions because they are the engines of local and regional knowledge development and natural leaders of their own evolving academic systems. As these systems become increasingly complex and the need to nurture knowledge networks for research grows ever more essential, the success of these institutions becomes even more crucial for national development policy. (2013: 18)

Echoing the above sentiments, Altbach (2013) states that, while research universities in the developing world have not yet achieved the top levels of global rankings, they are extraordinarily important in their countries and regions, and are steadily improving their reputations and competitiveness on the international stage. A key point is that research universities around the world are part of an active community of institutions which share values, foci and missions.

But not all universities are research universities. Research universities are a relatively small percentage of the higher education sector. In America, the proportion of research-intensive universities is about 5% (220 research universities in a system of more than 4 000 post-secondary institutions: see Chapter 3: 39 above), in the UK 25% (25 research universities among 100 universities) and in China 3% (100 research universities out of more than 3 000 institutions countrywide). In many smaller developing countries, there is often only one research university and many countries have none (Altbach 2013).

A clearly differentiated academic system is needed for research universities to flourish. For that, developing countries need to differentiate the missions of institutions in the post-secondary system, and to organise institutions in a rational way. But according to Altbach:

The fact is that few if any developing countries have a differentiated academic system in place; and this central organisational requirement remains a key task [...] These institutions must be clearly identified and supported. There must be arrangements so that the number of research universities will be sufficiently limited so that funding is available for them and that other resources, such as well-qualified academics, are not spread too thinly. (2013: 328)

The reluctance of governments in Africa to support differentiated research universities is a major stumbling block towards developing a research university.

*Does Africa have research universities?*

Altbach and Balán (2007) did not include Africa in their book *World Class Worldwide* that deals with the transformation of research universities in Asia and Latin America. They justify the exclusion of Africa on the grounds that the continent's academic challenges are sufficiently different from those of Latin America and Asia (Altbach & Balán 2007: vii). They provide no empirical evidence for the exclusion of Africa. Nevertheless, in the current context of world class and rankings, an inevitable starting point is considering how Africa is doing in the global rankings, and it is obvious that African universities do not fare well.

Times Higher Education's (2017) ranking of universities in BRICS and Emerging Economies scoring has a heavy bias towards research, with half of the score made up of 'direct' research components: 30% of the score for 'Research (volume, income and reputation)' and 20% for 'Citations (research influence)'.

Other components could be described as being comprised of ‘indirect’ research such as ‘Doctorates awarded to academic staff’ at 6% (academic staff with doctorates reflect an institutional commitment to producing the next generation of academics and the awarding of PhDs is an indicator of new research capacity), ‘International collaboration’ at 3.34% (often predicated on research collaboration), and ‘Industry income’ at 10% (in which case the university must have produced knowledge or have the expertise to apply to transfer existing cutting-edge knowledge to industries eager for innovation and invention).

Times Higher Education’s (2017) ranking of universities in BRICS and Emerging Economies<sup>1</sup> reveals that in the Top 20 there are two universities from Africa, both from South Africa (University of Cape Town, 4th; University of the Witwatersrand, 8th). Only ten other sub-Saharan African universities appear in the ranking of 300 universities, and only three of these are outside of South Africa: University of Ghana, University of Nairobi and University of Ibadan.<sup>2</sup> In comparison, Russia has three universities in the Top 20 while Brazil and India each have one university in the Top 20. China and Taiwan lead the way with seven and three universities respectively in the Top 20.

Evidence about Africa’s performance on the global research and science stage is not encouraging. Zeleza, in a broad-ranging review of Africa’s performance in science, technology, engineering, and mathematics (STEM), shows that Africa remains at the bottom of the global science, technology and innovation league tables and lags behind on key indicators, such as the gross domestic expenditure on research and development,

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- 1 The BRICS & Emerging Economies Rankings use the same 13 calibrated performance indicators as for the World University Rankings, but the weightings are specially recalibrated to reflect the characteristics of emerging economy universities. Universities are excluded from the BRICS & Emerging Economies Rankings if they do not teach undergraduates or if their research output amounted to fewer than 200 papers a year between 2010 and 2014.
  - 2 Makerere University is not listed in the BRICS and Emerging Economies Rankings because Uganda is not eligible for inclusion. It is ranked in the 401–500 band of the World University Rankings 2016–2017 of 980 universities.

number of researchers and share of scientific publications and patents (Zeleza 2014: 1).

While Africa is at the bottom of every indicator, a positive feature is the growth in the publication of journal articles in Africa. According to Elsevier (Schemm 2013), from 1996 to 2012, the number of research papers published in scientific journals with at least one African author more than quadrupled from about 12 500 to over 52 000. During the same time the share of the world's articles with African authors almost doubled from 1.2% to around 2.3%, although admittedly from a low base.

A more favourable picture also emerges from the latest assessment of the state of science in the African Union. Using the Scopus database for peer reviewed publications, the African Observatory for Science, Technology and Innovation (2013) reports that, over the period 2008 to 2010, African Union publication output grew by 43% compared to the world average of 18%. If the African Union were considered a country, it would, in the BRICS context, be just behind India, China and Brazil, but ahead of Russia in publication output.

Zeleza argues that there is a considerable literature, by both national and international agencies and scholars, on the capacity constraints and challenges facing African countries in building robust research systems. Four key issues are highlighted:

1. Basing science policy on the technological and industrial needs of the particular society and integrating it into national development plans, with adequate and stable funding for implementation;
2. Massively expanding the size and support for the higher education sector;
3. Incentivising the business sector to invest in research and development by itself and through industry–university collaborations; and
4. Promoting scientific literacy as a critical means of popularising science, technology and innovation in society. (Zeleza 2014: 7)

However, the underlying assumption of Zeleza's synthesis is 'more for everybody' because in Africa no government or university sector wants to openly promote differentiation; at the same time, in all the countries there are national, first post-independence universities which are much better resourced and have much higher status than most other public and private universities. Research by CHET shows that, in South Africa, the sector is differentiated into clearly distinguishable clusters or groups in terms of a wide range of performance indicators (Bunting 2013). This differentiation occurred due to a combination of historical factors and performance-based funding in the post-1994 higher education system.

Castells (2001: 215–217) presents a number of structural and institutional reasons which might explain this lack of progress. The structural reasons include low levels of funding and 'the cumulative character of the process of uneven scientific development' leading, amongst other things, to a lack of centres of excellence that are at cutting edge of a specific area of specialisation. In other words, the academic environment in African universities is not attractive enough for talented national scholars who relocate to overseas universities as a consequence, especially in North America and Europe, which offer more attractive academic environments. The main institutional reason for a lack of progress is that African universities battle to manage the contradictory functions described by Castells; that is, African universities are unable to manage successfully the political and ideological functions alongside the academic teaching activities of the university.

### *An empirical overview of research at seven African universities*

In its analyses of research outputs at African universities from 2001 to 2014,<sup>3</sup> the HERANA project, in collaboration with the

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3 To achieve consistency in the data reporting, all dates have been converted to calendar years. If for example a university reports its academic year as 2013/14, then its data for that year will be reported as simply 2014. Seven of the original eight HERANA universities submitted data covering the full 14-year period. The

Centre for Research on Evaluation, Science and Technology at Stellenbosch University, extracted from the Web of Science<sup>4</sup> all papers which contained at least one author whose address was that of one of the eight flagship universities. If the authors of a research publication recorded on a citation index were employed by different universities, then full publication units were assigned to each of the universities concerned (Bunting et al. 2015).

To ensure maximum accuracy, the data that had been collected, systematised and analysed were returned to each institution's planning department in three stages for verification. The publication emerging from this research, *An Empirical Overview of Eight Flagship Universities in Africa* (Bunting et al. 2015), was also reviewed by each of the participating institutions before finalisation. A dataset which is unique to the African context was developed during this process, and contains 11 years of comparable data across these eight flagship universities.<sup>5</sup>

In its analyses of performance indicators, the HERANA project followed the OECD guidelines in taking the primary high-level knowledge inputs of universities to be doctoral enrolments and academic staff, and their high-level knowledge outputs to be doctoral graduates and research publications. For the purposes of these analyses, staff members were defined as persons who were on the payroll of a university in either a full-time or part-time capacity. They were classified as permanent if they held a full-time contract of more than three years, and as temporary if they did not have such a contract. The staff employed by universities were placed into three broad categories: academic (more than 50% of time on research or instruction); administrative (including executive management, deans and other senior administrative positions spending less than 50% of their time on teaching/research); and service (mainly lower-skilled, such as cleaning and gardening employees).

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University of Dar es Salaam was not able to meet the data requirements for the HERANA Phase 3 of 2011/12 to 2013/14 (but has subsequently done so).

4 Web of Science: <http://thomsonreuters.com/thomson-reuters-web-of-science/>

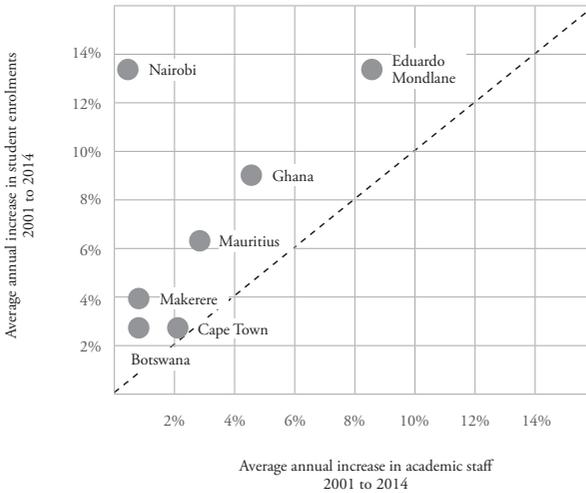
5 See <http://www.chet.org.za/data/african-he-opendata>

A key component in the analyses of performance was the link between knowledge outputs and high-level academic staff inputs of universities, which were taken to include their permanent academic staff with doctoral qualifications, and their senior academic staff who hold ranks of full professor or associate professor. These two sets of permanent academics do not necessarily overlap: some staff with doctorates may hold the rank of lecturer or senior lecturer, while some professors and associate professors may not have doctoral qualifications. The key issue is that a university's permanent academic staff in the two groupings should be its research leaders.

The data shows substantial enrolment growth over the 14-year period (see Table 1 in Appendix 2). Total enrolments increased by 147 000 (or 162%) in 2014 compared to 2001. Undergraduate enrolments increased by 123 000 (or 155%) and postgraduate enrolments by 24 000 (or 212%). The average annual growth rate in total enrolments was a very high 7.7% over this period. The patterns of growth differed widely across the seven universities (see Figure 1 in Appendix 2). Three universities (Nairobi, Ghana and Eduardo Mondlane) accounted for 111 000 (or 76%) of the total growth of 147 000. Their average annual growth rates ranged from 10.2% to 12.8%, compared to the growth rates of between 3.0% and 4.1% for the other four universities. The most striking is Nairobi which increased by almost 53 000 students (average annual growth rate of 11.9%).

The average annual enrolment growth rate in enrolments of 7.7% between 2001 to 2014 was more than double the average annual growth rate of 3.4% in permanent academics. The most striking data are those for Nairobi which reported an average annual increase of 11.9% in student enrolments and an average annual increase of only 0.1% in permanent academics (see Figure 1 in Appendix 2). Figure 1 illustrates the relationship between growth in student enrolments and academic staff. It shows that UCT, Botswana and Makerere maintained a 'balance' between staff and student growth and Nairobi grew too fast in terms of student growth while Eduardo Mondlane grew fast in both.

Figure 1: Percentage growth in enrolments and academic staff at eight African universities, 2001–2014



In terms of producing more doctorates and research publications, the proportion between postgraduate and undergraduate student numbers is important (Cloete et al. 2015). The data show that with the exception of Cape Town, the other six universities were mainly undergraduate institutions in 2014 with four having an undergraduate proportion of more than 90%. It is clearly difficult for African universities to change the mix between undergraduate and postgraduate students: during the period 2001 to 2014 the decrease in the proportion of undergraduates was only 2 percentage points (see Figure 2 in Appendix 2).

A university which is well equipped for the production of high-level knowledge should be one which has a high proportion of senior academic staff and a high proportion of academic staff with doctorates. The 2014 data for the proportion of permanent academics in the senior ranks to the proportion of those with doctorates as their highest formal qualifications show that Cape Town and Botswana were the only universities with more than

50% of academic staff in the senior ranks, and Botswana, Ghana and Cape Town were the only universities with more than 60% of staff with doctorates (see Figure 3 in Appendix 2).

During the period 2001 to 2014 there was growth in the percentage of staff with doctorates at Cape Town, Ghana, Mauritius and Makerere to levels of between 40% and 70% in 2014. However, the proportion of staff with doctorates decreased at Botswana and there was a significant decline of 21% at Nairobi to just over 20% of staff with doctorates in 2014 (see Figure 4 in Appendix 2).

The knowledge production outputs of universities are generally taken to be doctoral graduates and research publications. The seven universities produced a total of 3 538 doctoral graduates over the 14-year period 2001 to 2014. Cape Town produced the highest total and proportion of 2 013 and 57%, followed by Nairobi with a total of 539 and 15% of the doctoral aggregate. The overall trend is an increase in output (see Figure 5 in Appendix 2). For example, Nairobi's doctoral graduate total increased from 26 in 2001 to 100 in 2014, and Makerere's total increased from 10 in 2001 to 54 in 2014. Nairobi, with the largest increase in student enrolments, and the biggest decrease in staff with doctorates also shows an increase in doctoral output. The only decline is at Mauritius, and the lack of doctoral graduates at Eduardo Mondlane is attributable to the fact that their doctoral students are registered in Sweden as part of Swedish SIDA grants. From 2016 this will change with doctoral students registered at Eduardo Mondlane and participating in joint doctoral programmes with Swedish and South African universities.

The research publication data show that the seven universities produced a total of 32 371 research publications over the 14-year period 2001 to 2014. Cape Town was assigned 23 055 whole units (or 63%) of the total for this period, followed by Makerere with a whole unit total of 4 012 or 12% of the total. Figure 2 shows that there was an increase in output at all the universities, with Makerere and Ghana showing the strongest growth.

Figure 2: Journal articles indexed in the Web of Science for eight African universities, 2001–2014

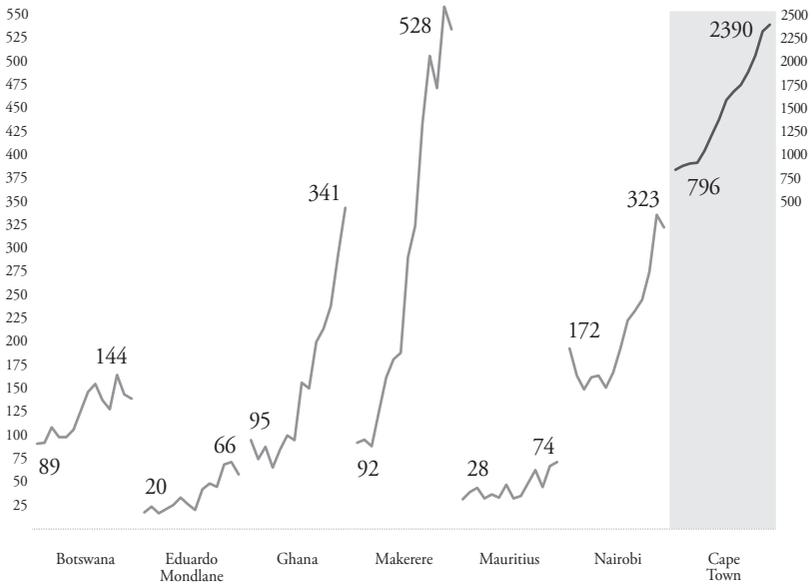


Table 1: Ratios of total publication units to total permanent academic staff at eight African universities, 2001–2014

	2000/01	2004/05	2007/08	2010/11	2013/14
Botswana	0.13	0.13	0.19	0.18	0.20
Cape Town	1.18	1.24	1.76	2.02	2.19
Eduardo Mondlane	0.04	0.04	0.03	0.04	0.04
Ghana	0.14	0.10	0.20	0.20	0.27
Makerere	0.09	0.15	0.24	0.41	0.38
Mauritius	0.14	0.16	0.13	0.22	0.25
Nairobi	0.14	0.11	0.13	0.17	0.26

Table 1 expresses the research publication units allocated to the seven universities as ratios of their permanent academic staff totals. The resulting ratios are related to a HERANA performance target

of 1.0 research publication units per permanent academic staff member per annum. The data in the table show that only Cape Town exceeded the target. Its ratio of research publications to permanent academic staff members rose from 1.18 in 2001 to 2.19 in 2014. None of the other six universities exceeded a ratio of 0.5.

### *Contradictory functions*

In terms of the different functions of universities, Castells (1991) observed that ‘because universities are social systems and historically produced institutions’, they undertake all of the four functions simultaneously within the same structure – although with different emphases at different historical moments. Castells concludes that the ‘critical element in the structure and dynamics of university systems is to combine and make compatible seemingly contradictory functions’.

To illustrate these possible ‘contradictions’, three case studies were chosen from the group of HERANA universities. These case studies appear in a paper entitled ‘Data Trends and Institutional Performance: An overview of seven HERANA universities’, which was presented at a meeting in Cape Town in November 2015 (Bunting & Cloete 2015).

The University of Mauritius was selected because it is located in the only African country studied that had a pact about the role of higher education and explicit knowledge economy policies. The universities of Nairobi and Makerere were included because they are both large, well-known African universities that have intentions and policies to become research-led, but are grappling with trading off enrolment expansion with a focus on doctoral training and research, albeit with somewhat different outcomes.

### *Mauritius*

Mauritius is the only country in the HERANA group that has a very explicit role for higher education in development, as articulated in national policy documents such as ‘Developing Mauritius into a Knowledge Hub and a Centre of Higher Learning’, and

is currently rated the most competitive economy in Africa by the World Economic Forum.

However, the assessment of the University of Mauritius as a flagship institution showed that it met only 3 of 13 flagship targets – those relating to its proportion of students in science, engineering and technology (SET), and to its throughput rates of masters and doctoral graduates. Furthermore, the institution exhibited a number of weaknesses in relation to knowledge production, for instance:

- Mauritius remained primarily an undergraduate institution over the 14-year period 2001 to 2014, with more than 90% of students enrolled in undergraduate programmes. As a consequence, Mauritius' proportions of masters and doctoral enrolments remained low, and below the flagship targets as well as the averages for the other HERANA universities.
- Mauritius's total of tenured academics grew at only half the average annual rate of its total student enrolment growth over the period 2001 to 2014: 3.3% compared to 6.6%. Student to academic staff ratios nevertheless remained favourable, and the capacity of Mauritius' academic staff to supervise doctoral students and produce research outputs improved. By 2014, 47% of tenured academics held doctoral degrees, but doctoral enrolments in that year totalled only 20. There were therefore seven academics with doctorates available per doctoral student requiring supervision.
- The research outputs of Mauritius were low throughout the 14-year period. In 2014, the university had 295 tenured academics, and they produced a total of only 144 research articles. Its average annual article output per academic staff member has been about 0.5, which is below both the flagship target of 1.0 and the output averages of other HERANA universities.

In summary, the assessment of the University of Mauritius shows that despite Mauritius being the only country in the HERANA

project that had a pact of policies and strategies to be a leader in the knowledge economy, without a policy of differentiation in the higher education system, the University of Mauritius has not been able to make a trade-off between being a largely undergraduate teaching institution and a research-led flagship university. In other words, the contradictory functions of training for the labour market and producing (and applying) scientific knowledge have not been managed in a way that allows the university to assume a role as a producer of new knowledge. As previous HERANA-related research has shown, there is clearly misalignment between system-level aspirations and the University of Mauritius's ability to fulfil those aspirations (Van Schalkwyk 2011).

### *Nairobi*

The University of Nairobi has taken some steps towards its ambition of being a research-intensive university, such as establishing an office for a deputy vice-chancellor for research, appointing a director of research, increasing research funding, introducing recognition and incentives for outstanding researchers, and strengthening support for postgraduate research.

The assessment of the University of Nairobi as a flagship university shows that by 2014 the university met only 3 of HERANA's 13 flagship targets. It had a high proportion of enrolments in masters programmes, a favourable ratio of full-time equivalent students to academic-staff in science and technology programmes, and a high throughput rate of masters graduates.

The assessment also highlights the areas in which the university appears to be facing serious challenges, including the following:

- Nairobi had substantial increases in masters students between 2001 and 2014. The total of masters enrolments increased from 1 700 in 2001 to 11 800 in 2014; an average annual increase of 10.8%. In 2014, 17% of Nairobi's students were enrolled for masters degrees, which implied that it could not be termed a 'primarily undergraduate' university. But despite this increase in masters students, the number of doctoral

enrolments remained low and reached only 700 in 2014. The proportion of Nairobi's students in doctoral programmes reached only 1% in 2014, which was well below the HERANA flagship target of 3%.

- Nairobi's total undergraduate plus postgraduate student enrolment grew at an average annual rate of 11.9% between 2001 and 2014. In marked contrast, its total of tenured academics increased at an average annual rate of only 0.1% over the period. Its student to academic staff ratios for fields of study in business and management, education, and social science and humanities became increasingly unsatisfactory over the period.
- The numbers of Nairobi's academic staff who had doctoral degrees and who could be expected to supervise research students dropped by half over the five-year period 2010 to 2014. In 2010, 600 or 45% of the university's permanent academics held doctoral degrees, compared to the 2014 total of 302 or 24%.
- Nairobi increased its research outputs in the form of doctoral graduates and research articles over the 14-year period 2001 to 2014. Its doctoral graduate total increased from 26 in 2001 to 100 in 2014, and its research article total from 172 to 314 in 2014. Its publication output relative to the number of academics employed was however only 0.26 in 2014, compared to the flagship target of 1.0.

In summary, Nairobi is an interesting example of a university that is trying to resolve the tensions of enrolment expansion (earning more income) and developing a stronger research postgraduate function, but without a supporting government policy framework. However, from the research and doctoral output figures, it is clear that the staff complement cannot cope with the contradictory pressures.

#### *Makerere*

Makerere's strategic plan has three pillars: becoming a research-led university, transitioning from a teacher-centred to a learner-

centred institution, and making a paradigm shift from outreach to knowledge transfer.

In order to move towards a research-led institution, Makerere instituted a number of strategies and structures, including the establishment of a directorate of research and graduate training, strengthening institutional planning, developing a framework for research management, and developing a research monitoring framework.

The assessment of Makerere shows that the institution met 3 of the 13 flagship targets. These relate to its favourable ratio of full-time equivalent students to academic staff in science and technology programmes, as well as the throughput rate of total graduates and of masters graduates. The assessment also showed that over the period 2001 to 2014, Makerere had faced specific challenges, including the following:

- The proportions of masters students and of doctoral students were below the flagship targets, below the average for the HERANA universities. In 2014, 6% of Makerere's enrolments were in masters programmes and 1.4% in doctoral programmes, compared to the targets of 12% and 3%. Nevertheless, between 2001 and 2014, masters enrolments doubled from 1 100 in 2001 to 2 200, while doctoral enrolments grew phenomenally from 32 to 563 (an average annual rate of 22.7%).
- Of particular concern for Makerere's ambition to become a research university is that it has remained a predominantly undergraduate university: in 2001, 94% of the student body was at the undergraduate level and this proportion had only dropped to 90% by 2014 – compared, for instance, to 65% at the University of Cape Town.
- Makerere's proportion of tenured academics with doctoral degrees improved to 44% in 2014, which was close to the flagship target of 50%. Its proportion of senior academics who could be research leaders was however problematic, being only 30%, which was half of the flagship target of 60%.

These proportions, and in particular the low proportion of senior academics, raise concerns about Makerere's research leadership capacity.

- Makerere's research publication output went from 92 in 2001 to 528 in 2014, an average annual increase of 14.4%, which was substantially higher than the average annual increase of 8.8% for the HERANA universities. But the publication totals were still low relative to the number of tenured academic staff. In 2014, Makerere's ratio of research publications to tenured academics was 0.38, which was well below the flagship target of 1.0.
- Makerere's research output in the form of doctoral graduates increased from 10 in 2001 to 54 in 2014. The output per tenured academic was however well below the flagship target: 0.04 compared to the target ratio of 0.15.

While Makerere's overall research outputs are low in international terms, the improvements in doctoral enrolments and graduation, and in research productivity, do represent substantial increases from the low starting base. These improvements also show that institutions with determined strategies and structural changes – such as capping undergraduate growth and increasing doctoral enrolments while curbing masters-level growth – can bring about change, even under adverse conditions.

### *Managing contradictory functions*

Two important ideas put forward by Manuel Castells were the importance of a university system and the challenges associated with managing contradictory functions. The challenge, then, is to develop institutions that will be strong and dynamic enough to withstand the tensions inherent in these contradictory functions, while at the same time be able to respond to what they see as their specific 'mission' or task in a particular moment in the history of the system. In Castells's formulation, the challenge is not to do with the endless rhetorical calls to shift the university from

the so-called ivory tower to the community, or the diametrically opposite demand of shifting the university from the public arena to secluded laboratories or capitalist boardrooms. Rather, for Castells (1991: 14; see also Chapter 3: 42–43 above):

The ability to manage the contradictions while emphasizing the universities' role in generating knowledge and training labour in the context of the new requirements of the development process will to a large extent determine the capacity of countries and regions to become part of the new world economy.

While it is important that different institutions fulfil different functions, which might be accentuated at different moments of history, universities need the capacity to constantly combine and re-combine their functions and emphases. Furthermore, this has to happen both within a university and also within a higher education *system* because all the contradictory functions of a system cannot be resolved within a single university (Castells 1991). That is why system differentiation is so critical. Ideally, these various functions of the university need to be distributed throughout a system with particular institutional types undertaking different combinations of functions. Yet it is in determining these combinations that prevailing debates and contestations arise.

While there are national factors (such as the lack of a coherent research policy framework) and institutional factors (such as incentives for teaching privately sponsored students) that mitigate against strengthening an institutional research culture, a major structural obstacle is the lack of differentiation in the national system.

### *Differentiation*

Van Vught (2007: 5-6) has argued that differentiation has the following positive effects for higher education systems:

- It improves access for students with different educational backgrounds and achievements;
- It enables social mobility by offering different modes of entry into higher education, multiple forms of transfer, and upward as well as ‘honourable downward’ mobility;
- It can meet the needs of the labour market by creating a growing variety of specialisations that are needed for economic and social development;
- It serves the needs of interest groups by allowing many to develop their own identity and political legitimisation; and
- It permits the crucial combination of elite and mass higher education: this combination is more diversified than elite systems on their own as they absorb a heterogeneous clientele and try to respond to a range of demands from the labour market.

Van Vught (2007) concluded that despite these obvious advantages, in recent decades, tertiary systems around the world have been becoming less diverse and differentiated. He attributed this to a combination of uniform (one-size-fits-all) government policies which tend to drive towards homogenisation, and the ability of powerful academic communities to defend their norms and aspirations (Van Vught 2007).

Njuguna Ng’ethe from the University of Nairobi reported on one of the first (and only) systematic studies focusing on differentiation in Africa (see Ng’ethe et al. 2008). This World Bank-sponsored investigation covered higher education systems in 12 African countries and, for comparative purposes, Korea, Singapore, Chile, the United Kingdom and France. Significantly, Ng’ethe observed that the expansion of higher education in Africa had not been accompanied by differentiation; instead, there was evidence of institutional isomorphism whereby newly established institutions strove to replicate the dominant ‘mother’ university (MacGregor 2008). In other words, the impulse was for universities to become more and more alike, rather than to develop diverse missions.

Ng'ethe highlighted four aspects which contribute to the trend towards institutional homogenisation in Africa (see MacGregor 2008).<sup>6</sup> Firstly, in most African countries, higher education funding is based on total student enrolments. Thus, even if an institution starts out with the intention of specialising in a particular area, in a context of low regulation, institutions are free to add other academic programmes, which are often money-spinners (meaning cheaper but popular). This can have the effect of undermining the potential for differentiation. Secondly, the uniform approach to institutional governance, in which institutions are established in the same way, under similar laws, does not allow for differentiation in governance mechanisms. If this is added to the undifferentiated government funding mechanism, then there is a great homogenising pressure. Thirdly, a phenomenon in African higher education is that of off-shore (private) providers. While these institutions do introduce some level of differentiation by offering degrees from other countries, they also offer popular courses in commercial areas (e.g. business administration or information and communication technology). In this regard, Ng'ethe concluded that 'overseas universities are not driving a high level of differentiation' (MacGregor 2008).

Finally, even when it appears that there are different types of institutions as reflected in different nomenclature (such as 'universities of technology'), more often than not, the curricula are not very different across these apparently different institutional types. The same can be said of academic programmes where different course titles belie otherwise very similar content.

Manuel Castells (see Chapter 4 above) emphasised the importance of the relative quality of a university system and observed that 'the quality, effectiveness and relevance of the university system will be directly related to the ability of people, society and institutions to develop' (Chapter 4: 95). The case

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6 Ng'ethe's focus on the issue of differentiation in the African context was mainly on size and shape (programme/curriculum) differences, with little attention to differentiation in terms of knowledge production (doctoral education and research output), which is the core focus of the HERANA project.

studies of the three African flagship universities discussed above illustrate that neither a university alone, nor a government on its own, can bring about a differentiated system that creates the conditions favourable for research-intensive institutions to thrive.

An important question is whether differentiated systems are more likely to be created by a strong, regulating government, or by autonomous institutions operating in market-like settings. As the studies referred to earlier show, the situation in Africa is not different from elsewhere; that is, autonomous higher education institutions do not attempt to develop a profile which is different from all other higher education institutions. Instead of looking for a fitting niche, each institution is driven by income- and status-maximisation. As a consequence, higher education institutions are naturally inclined to mimic other successful institutions, thereby effectively limiting system-level differentiation.

This change dynamic can only be moved in a differentiation-enhancing direction through effective government-led policies, incentives and regulations. Unfortunately, as the HERANA data show, the current situation in Africa deviates from this emerging understanding of the factors that stimulate system differentiation in higher education. First, government policies aimed at increasing the capacity of the higher education system by establishing new universities have in general used one basic university model, resulting in new universities becoming 'clones' of existing universities in the same system. Second, public and private institutions that enjoyed the level of institutional autonomy that allowed them to develop unique profiles have, in general, combined mimicking and budget-maximising behaviour (e.g. recruiting large numbers of fee-paying 'private' students).

As part of the broader HERANA project, Bailey (2015) concluded from the study of higher education councils in Africa that there was evidence of a shift from a state control approach to a state supervision model of higher education governance in all eight countries. This is a very significant and positive development in sub-Saharan Africa. A state supervisory system is characterised by 'multi-level multi-actor' governance which includes the redistribution of

decision-making powers, responsibilities and accountability among external and internal stakeholders. The governance architecture in such systems consists of a parent ministry (and its relevant department or unit) with overall responsibility for policy-making, strategic planning and ensuring compliance; semi-autonomous agencies responsible for, amongst others, policy implementation, distributing and monitoring public funds, external quality assurance and regulation (including setting norms and standards), monitoring and analysing, and providing expert advice; as well as informal national-level forums, comprising different levels of institutional leadership, which can make proposals to the parent ministry regarding the development of the sector.

A strong indicator of the move towards a state supervisory approach to governance is the emergence of specialised, semi-autonomous government agencies in what is often referred to as a process of ‘agencification’. Here, the main motives for the establishment of such agencies include demands on governments for greater efficiency, responsiveness, transparency and accountability; decreased political interference in governance matters; and enhanced technical expertise and the specialisation of functions.

The study on higher education councils (Bailey 2015) concluded that factors that were inhibiting the ability of the national councils/commissions to carry out their governance roles more effectively related to a lack of capacity and appropriate expertise; the lack of comprehensive and up-to-date data; a lack of system-level coordination; and the absence of the necessary leverage to compel institutions to meet their targets or the absence of a pact to guide the work of the councils/commissions within the overall system. Key policy issues identified were the need for a more detailed national plan for the tertiary/higher education system in each country; a review of governance roles and coordination at the system level; capacity-building and identification of expertise; the location (government or agency), development and maintenance of higher education management information systems; and greater clarity regarding autonomy and political independence – that is, a better understanding and acceptance of the need for

governments' higher education agencies to have an adequate degree of operational autonomy (Braun 2008).

A concurrent study by CREST (Mouton et al. 2015) of science (research) granting councils in Africa concluded, amongst others, that the relatively low investment in R&D in many sub-Saharan African countries, which has a direct impact on the science funding models, points to different 'inscriptions' of science in different countries and different values accorded to science. On the one hand, some governments clearly recognise the value and importance of science and hence invest in science funding and in the establishment of a national funding agency. On the other hand, many governments have not – at least until very recently – judged science to be of sufficient value and importance to invest in the establishment of a relatively autonomous agency to disburse state funds for research and development. But the fact that there has been a surge of interest in the recent past in reformulating existing science policies as well as in the establishment of a separate ministry of science, may be indicative of a change even amongst the latter category of countries. Both the Mouton et al. (2015) and Bailey (2015) studies conclude that there is an urgent need for greater investment in science and the restructuring and strengthening of the research systems in the countries studied.

In conclusion, while the universities seem to be committed to strengthening the knowledge production function, Mauritius shows that even with government policies on the role of the university in the knowledge economy in place, if there is not a deliberate commitment to differentiation at both the national and institutional levels, the function of undergraduate training will continue to dominate. And, despite strong institutional commitments to strengthening research at both Nairobi and Makerere, without national support that can curtail the strong pressure for fundraising by means of expanding undergraduate enrolments, African universities will not be able to manage the contradictory functions of undergraduate training and knowledge production.