

RESEARCH AND PhD CAPACITIES IN SUB-SAHARAN AFRICA: KENYA REPORT

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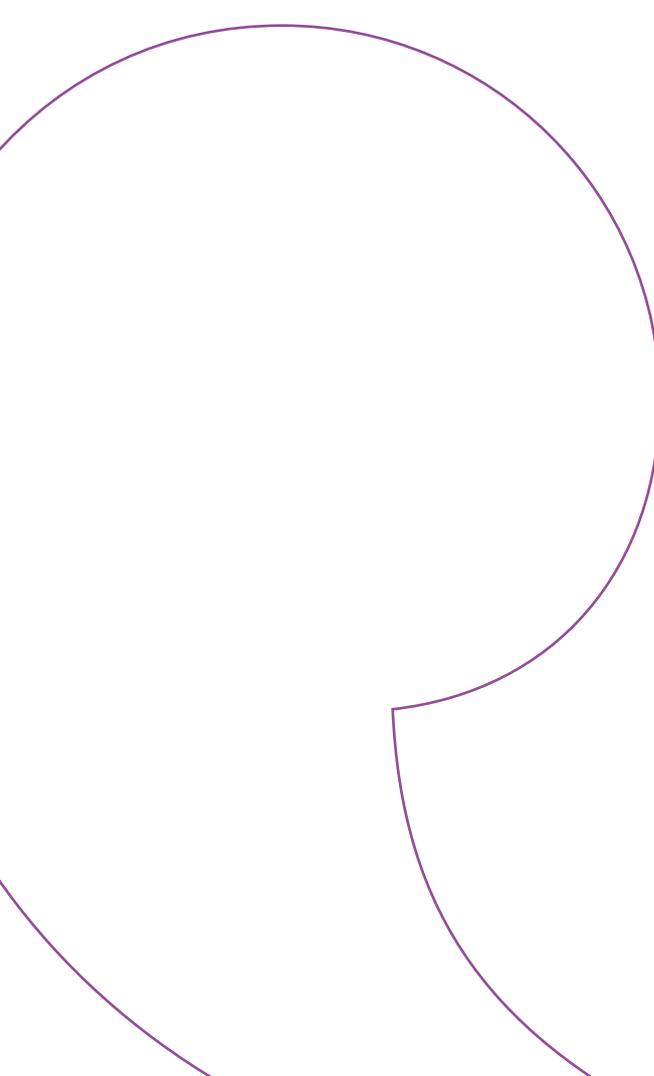
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Contents

List of tables	2
Foreword	3
1. The context of the higher education system in Kenya	4
1.1 Historical development	4
1.2 Current research and doctoral training landscape	4
2. Methodology	6
3. Availability, thematic priorities and quality of research and doctoral training	9
3.1 Availability and thematic priorities of PhD provision	9
3.2 Factors driving the introduction and expansion of PhD provision	10
3.3 PhD completion trends	11
3.4 Quality assurance practices in PhD training	13
4. National research agenda and doctoral training	16
4.1 Defining the national research agenda	16
4.2 Alignment between institutional research priorities and the national agenda	16
5. Engagement with industry, the private sector and social challenges	19
6. Funding research and PhD training	20
6.1 National and international sources of funding	20
6.2 Institutional and student experiences related to funding	20
7. The role of international collaboration in building PhD capacity	21
7.1 Overview	21
7.2 Bilateral models	21
7.3 Multilateral models	21
7.4 Internationalisation strategies of Kenyan institutions	22
8. Conclusion	23
9. Recommendations	24
References	26

List of tables

Table		Page
Table 1	Profiles of the sampled institutions	6–8
Table 2	PhD enrolments in Kenyan public and private universities	9–10
Table 3	PhD graduation trends in the sampled universities	12
Table 4	Academic staff qualifications by type of university	14
Table 5	NACOSTI-funded projects in science, technology and innovation by category	17

Foreword

This report forms part of a broader study commissioned by the British Council and the German Academic Exchange Service (DAAD) that surveyed research and doctoral training capacity in Sub-Saharan Africa.

The study includes six country reports, namely Ethiopia, Kenya, Ghana, Nigeria, Senegal and South Africa. This report addresses the outcomes of the study in relation to Kenya. The country reports include expanded contextualisation of the national research training landscape,¹ while a synthesis report is also available highlighting the key policy implications for PhD provision specifically.² The aims of the study were to investigate: (i) the availability,

quality and thematic priorities of PhD programmes and how they have changed over the last ten years; (ii) the national-level research agenda; (iii) the extent to which research training at an institutional level is aligned with the national agenda; (iv) national-level systems (policies, legislation) that facilitate alignment between institutional-level research training with the national agenda; (v) how institutional priorities reflect the needs of universities and emerging research and development systems, including local industry and societal challenges; (vi) funding sources to develop and sustain PhD provision; and (vii) the role of international collaboration in building PhD capacity.

The research, analysis, interpretations, conclusions and recommendations included in this report are those of the report authors.

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1. Country reports can be found on the British Council website <https://www.britishcouncil.org/education/ihe/knowledge-centre/developing-talent-employability/phd-capacities-sub-saharan-africa> and the DAAD website <https://www.daad.de/en/>
 2. The synthesis report can be accessed on the British Council website at <https://www.britishcouncil.org/education/ihe/knowledge-centre/developing-talent-employability/phd-capacities-sub-saharan-africa> and the DAAD website <https://www.daad.de/download/phd201806>

1. The context of the higher education system in Kenya

1.1 Historical development

According to the government of Kenya, the main objective of the university was – and still is – to serve the public interest and national development initiatives. It was to achieve these by pursuing excellence in teaching, research and scholarship and thus produce well-informed, practical and holistic graduates with skills and expertise to function in the development process of the nation, both in urban and rural settings, and also acquire a critical mind, problem-solving skills, professional values and right attitudes, and be responsive to the needs of others (Republic of Kenya, 1981).

Kenya has one of the fastest-growing higher education sectors in Sub-Saharan Africa. With only one university in 1970, by 2017 there were 74 accredited universities in Kenya (31 chartered public universities, six public constituent colleges, 18 private chartered universities, five private constituent colleges and 14 institutions with letters of interim authority) (CUE, November 2017). Student enrolment grew from 112,229 (68,345 male and 43,884 female) in 2006 to 539,749 (317,280 male and 222,469 female) in 2015–16. The government has invested in the growth of the higher education sector under the pressure of fast-growing numbers of secondary school leavers and in line with national development priorities which aim to create a middle-income economy and a knowledge society.

However, although the number of institutions in the university sector has expanded rapidly, the number of PhD students has remained relatively low.

In 2015, the enrolment of PhD students stood at 4,915 male and 2,231 female, bringing about a total of 7,146 candidates (or 1.3 per cent of the total higher education intake) in all categories of institutions from private to chartered universities.

There are a number of challenges that have accompanied the phenomenal growth of the higher education sector in Kenya, including funding, quality, diversity of programmes, inadequate infrastructure to support growing student numbers, and inadequately qualified staff. Most of the new universities established within the past ten-year period have also initiated doctoral programmes but are facing even more constraints, especially with qualified staff and facilities for doctoral training. This is the higher education context surrounding research training and PhD capacity in Kenya.

1.2 Current research and doctoral training landscape

1.2.1 Overview

By regional standards, Kenya is rated among the most competitive research systems in Africa (Tijssen, 2007) with about 3,794 research personnel (in all research and development, not just university-based) of whom about 35 per cent have PhD qualifications (NEPAD, 2010). Kenya is also placed fourth after South Africa, Egypt and Nigeria in knowledge generation in Africa (INASP, 2012). Findings from a recent bibliometric study of science, technology engineering and mathematics (STEM) research output in Sub-Saharan Africa indicate that East African researchers tend to be highly mobile and internationally connected beyond the region. Seventy per cent of

research output was co-authored with collaborators from outside the region, and 57.3 per cent of research output was authored by mobile scholars who have spent time inside and outside of Kenya (Elsevier and World Bank, 2014).

Kenya's Vision 2030 recognises the role of research in knowledge creation and utilisation in the country. The government (CUE, 2015) envisages the contemporary Kenyan university to be at the cutting edge of research and knowledge to enable the country to respond to its developmental challenges. However, the Commission for University Education has acknowledged the inadequacy of staff with doctoral qualifications in Kenyan universities. Therefore, there is an urgent need to build PhD capacity in the country, both in terms of fulfilling teaching needs at Kenya's higher education institutions, and in terms of meeting the national research agenda.

1.2.2 National policy actors related to higher education

The *Ministry of Education* is a key actor with the mandate to harmonise, implement, guide and co-ordinate matters of higher education, science and technology through its departments which have distinct functions: Directorate of Technical Education, Directorate of Research Management and Development (DRMD), National Council of Science and Technology, Directorate of Technical Accreditation and Quality Assurance, Directorate of Higher Education (DHE) and the Support Services Department. Of interest to this study are the DRMD and the DHE. The DHE focuses entirely on university-level education, including the co-ordination of higher education policy with the

objective of expanding access and improving the quality and relevance of university education, expanding access especially in strategic overseas areas, facilitating development of programmes and collaborations, and administering university scholarships. The DRMD oversees the development and promotion of research activities in the country. Its core functions are to integrate research into national development; formulate national research policy; co-ordinate research, research inventory and dissemination, and mobilise resources for research and development (R&D), research promotion and the sensitisation of R&D stakeholders; and to create regional and international collaboration on R&D.

The Commission for University Education (CUE) was established under the Universities Act of 2012 and is the successor to the Commission for Higher Education (CHE). CUE is a government agency mandated to regulate the provision of university education in Kenya. It ensures the maintenance of standards, and the quality and relevance in all aspects of university education, training and research.

1.2.3 National policy actors related to research

The National Commission for Science, Technology and Innovation (NACOSTI), established under the Science, Technology and Innovation Act 2013, manages and regulates research in Kenya. NACOSTI is mandated to regulate and assure quality in the science, technology and innovation sector and provide advice to the government on the sector. It has steered scientific advancement and technological development in the country through the administration of the Government Research Endowment Fund since the 2008–09 financial year. The fund is intended to support scientific research and innovations in science, technology and innovation priority areas for national development.

The National Research Fund (NRF) was established in 2014 to facilitate research for the advancement of science, technology and innovation as provided in section 33 of the Science, Technology and Innovation Act 2013. It mobilises resources for the Kenya National Innovation Agency from the government, the private sector, venture capital, development partners and

other sources. It manages and invests the funds for research and promotes multidisciplinary collaboration among universities and research institutions in Kenya. It also fosters co-operation and sharing of research information and knowledge, including supporting conferences, workshops, seminars, meetings and other symposia, and performs the monitoring and evaluation of the results and impact of the research activities financed by the Fund.

2. Methodology

This report is based on a comprehensive document analysis, data from questionnaires and selected interviews conducted with key stakeholders in a sample of universities and industry in Kenya. The methodology adopted included a literature review, an analysis of PhD graduate data from national and international sources, a review of national policy documents to identify the national-level agenda and enabling systems. To collect primary data, questionnaires were administered to all the identified institutions and organisations. The questionnaire focused on the following key facts: the type and volume of research activity, the priorities and broad thematic/disciplinary focus, the number and qualifications of research staff, details of research funding received and sources of funding, indication of

research outputs, indication of existing or recent collaborative work and knowledge exchange with other organisations. Customised interview schedules were developed for informants from university management, government departments, industry leaders, PhD scholars and alumni, selected through convenience sampling.

Interviews focused on identifying and characterising the institution's current and future PhD training culture and priorities, predominant research themes, methodological approaches, research infrastructure and profile of research staff (the number of staff and their qualifications), internal regulatory structures and policy frameworks; sources, mechanisms, strategies, and challenges of funding PhD studies; factors promoting or hindering PhD studies; and the presence and nature

of research co-operation at local, national and international levels. The interviews were recorded, transcribed and thematically analysed. The research team undertook the coding and developed an analytic framework for identifying, building, collating and managing the key concepts and themes emerging from the interviews.

In line with the aims of the study to capture a cross-section of diverse higher education institution (HEI) types, ten HEIs were selected for the study. The resulting sample comprised seven public and three private universities, all of which are accredited by CUE. To ensure diversity, the sampling criteria included the age of the institutions, location, research productivity, status (public/private), number of doctoral programmes and accessibility. Table 1 presents the profiles of the institutions selected for the study.

Table 1: Profiles of the sampled institutions

Institution	Established	Number of PhD Programmes	Structure of PhD provision	Thematic areas
University of Nairobi	1970	166	6 schools which house 1 centre, 16 schools, 6 institutes and cover 3 faculties	Humanities and Social Sciences (68)
				Biological and Physical Sciences (34)
				Health Sciences (32)
				Architecture and Engineering (16)
				Education and External Studies (11)
				Agriculture and Veterinary Sciences (5)

Table 1 continued

Institution	Established	Number of PhD Programmes	Structure of PhD provision	Thematic areas
Jomo Kenyatta University of Agriculture and Technology	1994	65	4 colleges, 5 schools, 1 faculty and 3 institutes	Entrepreneurship, Procurement and Management (13)
				Institute of Tropical Medicine and Infectious Diseases (ITROMID) (11)
				Biomedical Sciences (10)
				Biological Sciences; Engineering (7 each)
				Agriculture (6)
				Physical Sciences (5)
				Mathematical Sciences (3)
				Computer Science and Information Technology (2)
Biotechnology Research (1)				
Egerton University	1987	59	8 faculties and 1 institute	Arts and Social Sciences; Education and Community Studies (12 each)
				Agriculture (11)
				Science (9)
				Environment and Resources Development (7)
				Engineering and Technology (4)
				Commerce (2)
				Health Sciences; Women, Development Studies (1 each)
Maseno University	2001	53	9 schools and 1 faculty	Arts and Social Sciences (18)
				Biological Sciences and Physical Sciences (9)
				Education (8)
				Agriculture and Food Security (6)
				Public Health; Development and Strategic Studies; Mathematics and Actuarial Science (3 each)
				Environment and Earth Sciences (2)
				Business and Economics (1)

Table 1 continued

Institution	Established	Number of PhD Programmes	Structure of PhD provision	Thematic areas
Kenyatta University	1985	37	6 schools	Humanities and Social Sciences (26)
				Visual and Performing Arts (5)
				Pure and Applied Sciences; Education (2 each)
				Business; Economics (1 each)
Moi University	1984	31	8 schools	Arts and Social Sciences (9)
				Education (6)
				Biological and Physical Sciences; Human Resource Development; Information Sciences (4 each)
				Business and Economics (2)
				Engineering; Tourism, Hospitality and Events Management (1 each)
Pwani University	2007	18	4 schools	Education; Humanities and Social Sciences (6 each)
				Pure and Applied Sciences; Agriculture and Environmental Sciences (3 each)
Catholic University of Eastern Africa	1984	12	3 faculties	Theology; Education (5 each)
				Arts and Social Sciences (2)
Mount Kenya University	2008	7	3 schools	Social Sciences (4)
				Education (2)
				Business and Economics (1)
University of Eastern Africa, Baraton	1989	2	1 school	Education (2) (Teaching and Curriculum and Education Administration)

Source: CUE (2015) and institution websites

In order to provide cross-sector context to the institutional data, additional information was obtained through interviews with staff at the Ministry of Education, CUE, NACOSTI,

representatives of industry and international agencies engaged in higher education in Kenya.

3. Availability, thematic priorities and quality of research and doctoral training

3.1 Availability and thematic priorities of PhD provision

All the public universities in Kenya offer PhD programmes with a number of private universities such as Mount Kenya University and the University of Eastern Africa, Baraton also beginning to offer these programmes. This growth and expansion in PhD programmes coincides with the growth in numbers of students enrolling for PhD training. However, it is important to highlight that the growth and expansion in PhD programmes does not match the growth of institutions of higher learning. As noted above, for the academic year 2015–16 there

were 7,146 PhD students in Kenyan universities representing 1.3 per cent of the total student population (Mukhwana et al, 2016).

Doctoral research is heavily skewed towards business and administration, with moderate numbers in other social sciences, arts and humanities and agricultural sciences, but with fewer students in health sciences, other natural sciences and engineering. This suggests that despite the strategic emphasis on STEM in national policies, there are still low enrolments in these subjects. The distribution of PhD enrolments by discipline and gender is presented in Table 2 for the public and

private sectors respectively. Indeed, the diversity of doctoral programmes in Kenya is of concern for the government. While it is acknowledged that doctoral research in business, administration, and arts and humanities reflects the needs of the labour market and society, at the same time it is believed that over-concentration in these fields will disadvantage key national development sectors and may lead to over-production of graduates with similar skills (*ibid.*: 28). A cause for further concern is the disproportionate number of male students enrolled in PhD programmes compared to their female counterparts. The current ratio of male to female students is 2:1 (*ibid.*: 30).

Table 2: PhD enrolments in Kenyan public and private universities

Cluster	Male (Public)	Female (Public)	Public total	Male (Private)	Female (Private)	Private total	Combined total	Cluster coverage as % of total PhD enrolments
Business and administration	1,678	623	2,301	84	58	142	2,443	35.12%
Humanities and arts	301	136	437	257	63	320	757	10.88%
Education (arts)	347	232	579	21	26	47	626	9.00%
Social and behavioural science	366	95	461	42	66	108	569	8.18%
Health and welfare	174	149	323	4	5	9	332	4.77%
Life science and physical sciences	252	79	331	0	0	0	331	4.76%
Environment	183	89	272	0	0	0	272	3.91%
Other	3	0	3	127	116	243	246	3.54%
Agriculture, forestry and fisheries	181	52	233	5	3	8	241	3.46%
Teacher training	98	63	161	55	23	78	239	3.44%
Journalism and information	127	80	207	15	12	27	234	3.36%

Table 2 continued

Cluster	Male (Public)	Female (Public)	Public total	Male (Private)	Female (Private)	Private total	Combined total	Cluster coverage as % of total PhD enrolments
Mathematics and statistics	145	75	220	7	4	11	231	3.32%
Computing	143	54	197	1	3	4	201	2.89%
Engineering	61	10	71	0	0	0	71	1.02%
Services	29	31	60	0	0	0	60	0.86%
Veterinary	29	12	41	0	0	0	41	0.59%
Security and conflict resolution	26	5	31	0	0	0	31	0.45%
Education (science)	16	8	24	0	0	0	24	0.34%
Architecture	7	1	8	0	0	0	8	0.11%
Law	0	0	0	0	0	0	0	0.00%
Manufacturing	0	0	0	0	0	0	0	0.00%
Total	4,166	1,794	5,960	618	379	997	6,957	100%

Source: Adapted from CUE (2016: 36, 40)

3.2 Factors driving the introduction and expansion of PhD provision

PhD programmes in Kenya are initiated by the departments through the respective schools and finally with the approval of senate and university management. Data collected for this report shows that the establishment of most PhD programmes is based on current gaps in the doctoral programmes within the departments and faculties, the availability of qualified teaching staff and supervisors, the demand for such programmes from prospective students and faculty and, at times, as a response to the needs of governments and other stakeholders. In some cases doctoral programmes have been established as an

outcome of international partnerships and collaborations that Kenyan universities are engaged in. Other factors informing the introduction of PhD programmes include: the needs of stakeholders (industry/business); labour market demand for the programme; programme alignment to the university's mission and strategic plan; programme alignment to national priority development agendas; availability of qualified and experienced faculty; and availability of adequate learning resources and research infrastructure. However, the factors least considered are the influence of the professional associations, availability of funding and sustainability of the programme(s) over the medium to long term.

A recent CUE regulation that mandates a PhD qualification for university teaching staff by 2018 is providing impetus for expansion of PhD provision. This requirement has caused the demand for PhD training opportunities to soar in Kenyan universities as staff need to meet these new requirements. Departments are also under great pressure to ensure that most of their staff have PhDs as this allows them to enhance their internal capacities as departments and also to establish new PhD programmes. This new development should not, however, lead to compromising of quality, and the demand for PhD degrees is by far outweighing the capacity of the system to meet the demand.

In addition to this regulatory requirement, the growth is also driven by the need to develop a research culture among faculty members, in the departments and for the growing industry's interest. In one of the institutions it was noted that one other reason for introducing PhD programmes was for the purpose of revenue generation as faculties and schools were required to diversify their academic provision to attract more fee-paying students.

Furthermore, there is a need to embrace multidisciplinary research programmes. It was noted that some of the universities had already started inculcating multidisciplinary into their programmes. This includes setting up courses that could be taken by students from different disciplines and even sharing human resources from different faculties. This trend was evident in almost all the public universities included in this study. There was also a growing number of tailor-made joint seminars organised for doctoral students, most of which were much appreciated by students who have graduated from the universities.

3.3 PhD completion trends

3.3.1 National PhD completion trends

Kenya has set its national benchmark for doctoral graduation completion rate at 20 per cent, which means that for every cohort the target was to ensure that 20 per cent of the students graduate within the stipulated time of three years. However, the national average from the higher education institutions is currently at 11 per cent, and the average time to completion is

six years (i.e. double the prescribed duration of three years). Indeed, low completion rates and increasing dropout rates are considered a threat to doctoral training in Kenya.

A study by Ng'ethe et al. (2012) set out to determine the influence of leadership style; establish the influence of remuneration; determine the influence of training; establish the influence of promotion; and to establish the moderating influence of personal characteristics on academic staff retention in public universities. The study used a survey design and took a sample of 492 (ten per cent) of the whole population of lecturers in the public universities. It attributed the problems of completion to several factors including funding constraints for students, institutional challenges especially those related to supervision and inadequate support programmes and facilities for graduate students (*ibid.*: 9). The interviews with the alumni revealed several challenges that face graduate students in the Kenyan higher education system. In addition to funding, there were also challenges associated with student life circumstances, especially the fact that most of them were in employment and already had families thus constraining their time and resources that could be deployed to their PhD training. A number of the PhD students who were staff within the universities complained of being weighed down by a heavy workload especially due to the high student numbers. At the same time, the students felt that the programmes were not flexible enough to provide for their needs, especially as most of them were not conventional students.

3.3.2 Completion trends at the sampled institutions

The study noted that several institutions faced the challenge of low completion rates of PhD programmes. While we were not able to collect accurate data on completion rates for the past ten years, Table 3 overleaf outlines numbers of students graduating at the sample institutions based on data submitted to CUE for 2011–14. Establishing accurate completion/throughput rates is a challenge for institutions not just at postgraduate level but undergraduate too. They cannot with definite data explain at which point each learner is, due to deferment, interschool transfers and expected time of graduation. This is an issue that needs to be attended to by any future programme design and evaluations. The sampled institutions were able to comment on PhD dropout rates, however, and over the last ten years this was found to be about five per cent in some institutions while in others it was as high as 20 to 50 per cent.

Despite the concerning picture painted above, it is important to note that the time to graduation has been decreasing in the past few years, especially due to International Organization for Standardization (ISO) requirements resulting in new institutional policies to manage doctoral training. Institutional policies have also been developed in response to the CUE requirements that every university should account for the progress of every graduate student and reports are periodically submitted by the academic departments and/or schools. (These issues are discussed in further detail in Section 3.5 on quality assurance practices.)

Table 3: PhD graduation trends in the sampled universities

University	Academic year				Totals
	2011–12	2012–13	2013–14	2014–15	
University of Nairobi	n/a	n/a	74	43	117
Moi University	58	40	42	56	196
Kenyatta University	55	62	115	117	349
Egerton University	12	21	29	22	84
Jomo Kenyatta University of Science and Technology	46	46	65	103	260
Maseno University	18	24	21	18	81
Pwani University	0	0	0	3	3
Catholic University of Eastern Africa	16	22	23	19	80
Mount Kenya University	0	4	4	9	17
University of Eastern Africa, Baraton	n/a	n/a	n/a	n/a	n/a
n/a – no data was available at the time					

Source: Adapted from CUE (2016: 134–135)

Doctoral students took a long time to graduate for several reasons. As discussed earlier in relation to national trends, one of the main reasons cited for delay in completion included students' personal life and work circumstances and funding constraints. This was supported by the interview results which revealed that many PhD students were unable to complete their studies within the stipulated time of three years because they were engaged in other activities such as part-time teaching, other employment and family commitments. Most PhD students were relatively older with the majority being over 40 years old, which would explain this. In addition, they stated that supervisors took too long to give them feedback on their work

and there were also no institutional mechanisms to seek redress in such cases. Supervisors were of the view that some of the students did not keep in touch after completing coursework. However, some institutions cited other factors such as the lack of research facilities and equipment; supervisors who take on the job without commitment; shortage of qualified supervisors; work overload for the graduate faculty members; and the fact that employers of PhD students do not provide funded leave, therefore students lack the time to concentrate on their studies. There was one exception to this. A deputy vice-chancellor responsible for research at one institution observed that 'in order to encourage many staff to undertake

their PhD studies, there is support offered in various ways: their workload is reduced to take up 40 per cent of their time while the other 60 per cent is dedicated to their own research.'

It was also noted that the timeframes for completing different stages of doctoral training were quite long, causing delays for the students. For instance, the process of developing and approving the research proposals was slow so that by the time students are allowed to go to the field to collect data it was usually towards the second half of their second year. Therefore, they had barely enough time to collect data and write the thesis in readiness for examination.

3.3.3 Implications of low completion rates for the format of provision

In Kenya doctoral training is offered in two main tracks: regular full-time and part-time provision.³ Both tracks can either be taken through advanced research with the thesis as the end product or both course work and project report/thesis at the end depending on the organisation of the institution. In the second option the course work does not diminish or replace the requirements for thesis writing.

The interview responses suggest that PhD provision needs to cater to the growing diversity of students requiring doctoral education, especially those already in employment. In line with this, Kenyan universities will have to diversify and broaden the pathways to the PhD degree. This is critical to encourage candidates in specialised fields who may not have the liberty to leave their jobs to undertake on-campus PhD training. At the same time, in order to address the challenge of completion for the typically mature cohort, it would be useful to develop and nurture more young scholars in PhD programmes, as this could lead to higher throughputs and in the end more sustainability of the research and knowledge production systems in the universities.

3.4 Quality assurance practices in PhD training

3.4.1 Overview: policies and concepts

We have already noted the commitment of the government of Kenya to quality reforms through the new provisions granted to the CUE. At the institutional level, most Kenyan universities have

established quality assurance offices. This has been mainly as a result of the German Academic Exchange Service (DAAD) and the Inter-University Council for East Africa (IUCEA) project on quality reforms for East African universities. Through the project, member universities of IUCEA were trained on how to manage, implement and sustain institutional quality assurance mechanisms. In Kenya, the implementation of ISO standards in the universities has also improved quality of service in different sectors, especially systems and procedures which have also had impacts on doctoral training. The public universities studied had policy documents and operation manuals on quality. This was an indication of their commitment to enhance the quality of their programmes even amid the many challenges they were facing. In addition, they had policy documents and regulations governing PhD training. As one of the deans noted: 'our university is keen on quality training and completion rates of PhD and this is ensured through the use of approved policies and procedures and qualified graduate faculty.' The universities were attempting to adapt several ways of responding to quality issues beginning with admission regulations and procedures for PhD students, institutional accreditation, programme accreditation, systems and procedures for evaluating the quality of teaching and learning related to PhD programmes. In addition, they observed that they effectively handled systems and procedures for assessing the quantity and quality of research-related PhD programmes, policies and procedures for supervision of PhD students, regulations and procedures for thesis examination and structures to co-ordinate and manage PhD programmes.

In addition to specific policies regulating the administration of PhD programmes, improving the quality of PhD provision is also understood more generally by institutions as enhancing the relevance of programmes. The older and well-established universities indicated notable changes in the following areas: (a) change from training of PhD through research only to training through course work and research (in this study these institutions include Egerton University, Moi University, and the Catholic University of Eastern Africa); (b) providing a more practice-orientated PhD training; (c) curriculum changes and revisions focused on content and number of courses offered in a programme; and (d) the introduction of new and specialised programmes. These changes have been initiated for several reasons, including the need to respond to the demands of the labour market; the growth and access to information communication technologies (ICTs); responding to the unpopularity of some of the programmes among PhD students; and helping PhD students familiarise themselves with the faculty prior to preparing and writing proposals.

3.4.2 PhD admission regulations

In most of the institutions there were clear rules and procedures governing admission to doctoral programmes. These were mainly established by respective senates or graduate schools and administered either by the faculties or school or by the graduate schools. In most universities admissions to PhD programmes were centralised in the graduate schools. Only very few had admissions processed at faculty level.

3. Data collected for this study did not indicate the proportion of PhD students in each of these study modes or tracks.

3.4.3 Academic staff qualifications

In the provision of quality PhD training, qualified academic staff is a fundamental requirement. It was noted that well over half of academic staff in public universities did not have PhDs. This situation was more serious in the newly established public universities and in the private universities. Overall, the associate and full professors represent 5–10 per cent of the total number of staff, and about 40 per cent of the academic staff hold doctoral degrees in the established older

universities. However, what is interesting to note is the fact that schools or faculties that are arts- and social science-based have higher numbers of PhD holders (approximately 40 per cent). In the science and technology-based schools or faculties, PhD holders are as low as 25 per cent. In addition, in some of the young universities and new schools or faculties, there were hardly any professors. The majority of academic staff have master's degrees as their highest academic qualification. The low level of academic staff

qualifications are compounded by the fact that the numbers of academic staff qualified to teach PhD students are also low. The findings of the current study mirror the status of qualifications of staff as highlighted by Mukhwana et al. (2016). The academic staff qualification per university category is shown in Table 4. This data shows that there is a lack of adequately qualified and experienced academic staff to effectively drive the process of PhD training and research in Kenya, hence the need to train more people at doctoral level.

Table 4: Academic staff qualifications by type of university

University category	Academic staff qualifications				Total	Proportion of staff at each university category with PhD qualifications (%)
	PhD	Master's	Bachelor's	Diploma		
Public chartered universities	4,215	5,661	1,004	530	11,410	37%
Public university constituent colleges	133	292	100	78	603	22%
Private chartered universities	923	1,936	168	43	3,070	30%
Private university constituent colleges	113	91	6	2	212	53%
Private universities with letter of interim authority	220	713	87	3	1,023	21.5%
Total	5,604	8,693	1,365	656	16,318	
Proportion of total staff by qualification level (%)	34%	53%	9%	4%	100%	

Source: CUE (2016: 53)

3.4.4 Process of PhD supervision

Supervision has been identified as one of the major challenges afflicting PhD training in Kenyan universities. As already discussed in the previous section, this is partly due to the inadequate numbers of staff with doctoral qualifications who can supervise doctoral students. As a result of this challenge, it was also noted that supervisors in several instances were allocated more doctoral students than they could manage, which led to delays and could also have quality implications. In one of the public universities, one supervisor confirmed graduating five students the previous year, suggesting a heavy supervision load and the possibility that the students may not have obtained the requisite supervisory assistance in view of their numbers.

Institutions actually did have specific regulations and policies governing the process of PhD supervision, namely for assigning PhD supervisors, establishing supervisory teams, the number of PhD candidates assigned per supervisor; requirements for the number of meetings between PhD candidate and supervisor(s); and progress reports schedules and milestones. Furthermore, the study results established that each PhD student is assigned at least two supervisors in some cases, while each supervisor is allowed between three to four PhD candidates for supervision. This is information that was also highlighted in the Kenyatta University Graduate School handbook (2012), as well as that of Moi University Directorate of Graduate Studies. In the various universities in Kenya, the requirements for the number of meetings between PhD candidate and supervisor(s)

ranged from every two weeks to every three months (quarterly). Equally, the period for submitting progress report schedules and milestones in the supervision process ranged from every month to every four months.

However, it is important to note that the only aspect that almost all the institutions did not seem to consider in the supervision process is the requirement for training of supervisors and a code of ethics to guide supervision of students. Despite evidence that most institutions have effective supervision processes, major challenges to the effectiveness of quality assurance processes still exist. A further concern was the difficulty experienced in the actualisation of the requirements of these policies.

3.4.5 Provision of resources and facilities for PhD training

The research facilities, equipment, laboratories and other resources needed by various institutions are basically determined by the nature of PhD programmes being offered, the number of students enrolled and other unique institutional factors. The types, quality and amount of resources dedicated to PhD training varied from one institution to another. The results further show that the thematic areas are not dependent on the provision of these resources and equipment. The institutions under study in this research project further provided an evaluation of the adequacy and quality of facilities, equipment, laboratories and other resources used by PhD students. The results indicated that most institutions had structures and facilities in place to support PhD training. Most of the respondents observed that among the factors

supportive of PhD training were the library facilities and holdings: electronic journals; the electronic learning resources like computers and internet access; and the research infrastructure like laboratories, equipment and IT. In addition, the web-based campus computer services, working space (office) for PhD students and career development support were adequate and of good quality. However, a smaller number of the institutions indicated that this research infrastructure was inadequate and of poor quality.

3.4.6 Summary

Despite the fact that some institutions provide regulations on quality assurance of PhD provision, the findings from the interviews and questionnaires show that there are great variations in the systems and procedures that universities have adopted. This indicates that the issue of quality receives only superficial attention. The institutions do not deliberately focus on pertinent areas that would greatly enhance quality in the provision of PhD programmes. Areas that require additional attention include institutional systems for evaluating the organisation and quality of PhD supervision, systems and procedures for monitoring the progress of PhD students, as well as structures to facilitate partnership with industry and business sectors related to PhD training. Further, they have not effectively dealt with systems to promote a stimulating research and working environment for PhD students, institutional systems and mechanics for funding PhD research and institutional systems for the periodic review of PhD programmes.

4. National research agenda and doctoral training

4.1 Defining the national research agenda

Kenya's Vision 2030 is a blueprint that is shaping the country's future development trajectory. Within the social pillar of the vision, education and research are recognised as having a clear and strong role in the realisation of the vision. Kenya's Universities Act locates higher education within the context of Kenya's Vision 2030, which aims to transform Kenya into a globally competitive, middle-income country by 2030. The strategy acknowledges the university sector as core to the development of the necessary human resource base necessary to achieve these goals primarily through the provision of high-quality, skill-based and results-orientated learning.

In the last decade, a number of policies have emerged all grounded in Kenya's Vision 2030 document. Sessional Paper No. 1 of 2005 has been the important turning point in the policy landscape. It called for the development of a competitive and demand-driven higher education sector with knowledge production playing a crucial role. From this Sessional Paper, the Kenya Education Sector Support Program (KESSP) was developed leading to a sector-wide funding programme for education including research at the universities. The Paper introduced the new dimension of a market-oriented co-ordination and financial diversification in higher education, more privatisation and public-private partnerships in several sectors including research (Jowi and Obamba, 2013). From 2006, there was a shift in focus to the need for a knowledge-based policy and development trajectory which clearly connected knowledge, higher education and sustainable development. This

called for an emphasis on science, technology and innovation, knowledge-driven development and university-industry links, although little support was given to this. The Public Universities Inspection Board (2016) called for a new knowledge-based economic dispensation in Kenya that was to largely rely on research and knowledge production, thus putting the universities at the core of the development process. The National Science, Technology and Innovation Policy and Strategy (Kenya Government, 2009) also underscores the role of research and doctoral training in the future development of the country.

Regarding research, various reconstituted institutions have been created under Kenya's new constitution of 2010. Of prime importance is NACOSTI. In 2012, the government approved the allocation of two per cent of gross domestic product (GDP) to be spent on research and innovation, although this funding and percentage has yet to be fully realised. By 2014 it stood at 0.8 per cent of GDP, which is far lower than government projections.

4.2 Alignment between institutional research priorities and the national agenda

4.2.1 General alignment

As discussed in Section 3.1 on the thematic priorities of PhD programmes, the national context and policy frameworks have in a way guided the research orientations in the ten institutions, suggesting that there is a common direction in the prioritisation of institutional plans and policies in alignment with national priorities. Furthermore, an analysis of the establishment of these institutions reveals that efforts have

been made to ensure that a variety of PhD programmes have been offered over the years. In spite of the similarities in the graduate training process, the nature and type of graduate programmes vary considerably, rendering each of these institutions unique with wide-ranging programmes in science, the arts or social science thematic areas. However, these would appear to depend on the philosophical and academic thematic orientation of each institution. In some cases these are determined by the geographical settings of the university and others determined by the initial parent institutions that led to their establishment. It should be noted that in the Kenyan context when a university campus becomes a university college, practice dictates that it must begin by offering the programmes offered by the parent university before being able to develop its customised programmes upon becoming a fully fledged university.

The research agenda of each institution indicates that they are geared towards the attainment of the Kenya national research and development agenda as portrayed in Vision 2030, and adherence to the CUE regulations and the Universities Act 2012 on the provision of given graduate programmes. Most of the universities make reference to the Millennium Development Goals (MDGs) rather than the Sustainable Development Goals (SDGs) in their strategic plans – the SDGs were accepted by the UN in 2015, so this observation indicates that these university plans are not necessarily current. It may be necessary for the institutions of higher learning within Kenya to review their strategic plans to accommodate the international move from MDGs to the SDGs, thus providing

for a very clear and broader pathway for education within the international development goals and framework. All the research policies reviewed did not directly refer to PhD studies but to wider university research activities and externally funded projects. Instead, terminology like research, postgraduate studies/students and graduate students/studies were used, which in this review were considered as umbrella references to all forms of research to be conducted in the institution, including that by master's and PhD studies/students.

In a number of universities such as Moi University and the Catholic University of Eastern Africa, research activities are organised under the directorate of research. The activities are determined by the demands of the research policy and research strategy of the institution. The main activities funded are conferences, inaugural lectures, public lectures, thematic seminars and workshops, research grants for staff to carry out research and school journals among other activities. In general, it was found that the research strategies and priorities in higher education are

in tandem with the goals of NACOSTI, the agency mandated to fund and manage research.

4.2.2 NACOSTI-funded projects

One of the key focus areas of funding by the Commission is capacity building through the use of PhD research. A total of 123 innovation projects have been funded, some resulting in business start-ups for the innovators. Table 5 provides a bird's eye view of the science, technology and innovation grant categories for PhD training and development.

Table 5: NACOSTI-funded projects in science, technology and innovation by category

Summary of science, technology and innovation grant-funding categories – funded projects (2009–14)						
Category	First call	Second call	Third call	Fourth call	Fifth call	Total
Research projects	92	31	28	17	20	188
Women scientists	14	32	26	18	11	101
Innovations	14	8	19	37	45	123
PhD students	22	41	78	100	92	333
MSc/MA students	22	24	48	100	100	294
Post-doctoral	19	17	-	-	-	36
Research facilities	4	4	-	-	-	8
Sponsorship of conferences	30	31	15	-	24	100
Kenya/South Africa programme	6	10	11	-	12	39
NACOSTI-JSPS programme	2	2	1	-	2	7
Kenya/German joint PhD programme (DAAD)	-	-	-	-	-	54
Total						1,283

Source: NACOSTI 2012

Another NACOSTI scheme is the Research Chairs Initiative, which was announced on 5 June 2016. This is intended to attract Kenyan scientists in the diaspora back to an improved research environment, and retain top researchers already at universities. The programme was launched with two research chairs on health systems and agricultural biotechnology funded by NACOSTI and Canada's International Development Research Centre (IDRC). The latter is funding one of the chairs with a CDN\$1 million (US\$962,000) grant over five years in the project's pilot phase. The research chairs are drawn from public and private universities in Kenya. The next phase will include chairs in mining and space science. NACOSTI's other objective is to curtail Kenya's continued loss of established researchers to developed countries which offer them better remuneration, facilities and research funding. The funds provide for equipment and better salaries for scientists, but the host universities are expected to commit to improving the institutional environment for research.

4.2.3 Translating the research agenda into the Medium Term Plans

The research agenda of Kenya is nested in Kenya's Vision 2030 and the government's plan for its implementation in successive five-year Medium Term Plans (MTP). The first such plan ran until the end of 2012. The second MTP (2013–17) gives priority to devolution and to more rapid socioeconomic development with equity as a tool for building national unity. It is noted that the second MTP also aims to build on the successes of the first MTP (2008–12), particularly in increasing the scale and pace of economic transformation through infrastructure development, and strategic emphasis on priority sectors under the economic and social pillars of Vision 2030. The social pillar is crucial to the issue of PhD capacity because it encompasses university education and regards it as the driver of change in society. Under this MTP, transformation of the economy is pegged to rapid economic growth in

a stable macroeconomic environment, modernisation of infrastructure, diversification and commercialisation of agriculture, food security, a higher contribution of manufacturing to the GDP, wider access to African and global markets, and wider access for Kenyans to better quality education and healthcare. This agenda has been discussed earlier through the roles of national institutions charged with research, quality assurance and university education. In Kenya the research area of agricultural biotechnology is a priority because the country is weak in agricultural innovation yet demand for food production is rising. This is an example of what is referred to as university–industry links designed to ensure that knowledge generated at the universities helps solve industry problems.

5. Engagement with industry, the private sector and social challenges

The Kenyan higher education sector has quite limited links with industry and the private sector. University research and training has over the years not attended to the demands of the industrial sector and industry and the private sector have also not found an interface with the university. This gap needs to be addressed to enable stronger relations between these two sectors. It was noted that in the 1990s Moi University created an office to co-ordinate its links with industry, but this was later closed.

At the regional level, the IUCEA has been creating forums for debates and practicalities on how universities and industry could benefit from their synergies. The Kenya National Strategy for University Education Taskforce draft report outlines the strategic goals, objectives and strategies for the linkages and partnerships (Ogada, 2000). The strategies support seven types of linkages and partnerships, namely, university–industry; university–university; university–research institutes; university–middle-level colleges; university–international organisations; university–community; and university–relevant professional regulatory bodies. The main aim is to develop strong university linkages and partnerships that enhance mutual learning, research and innovation. The following justification for this is provided:

a. Strong linkages and partnerships will enhance the dissemination and utilisation of research findings and innovations emanating from the universities.

- b. Strong linkages and partnerships will enable universities to access resources available in the private sector.
- c. Linkages and partnerships provide platforms for consensus regarding policies on strategic areas of the economy.
- d. Linkages and partnerships can encourage pooling of human, physical and financial resources.
- e. Strong linkages and partnerships are necessary for the diversification of financing and the incorporation of talent in the governance structures.
- f. Linkages and partnerships provide an opportunity for identifying community needs and enhance the capacity for community involvement and improvement.

It is perceived that university partnerships, linkages and collaborations will enable universities to undertake relevant research to support industry and the job market. Consequently, the quality of education offered in the universities can improve, in particular PhD training. From the findings of this study it is difficult to determine the impact of these partnerships, linkages and collaborations in practice. There have been success stories in specific cases, such as the collaboration between Moi University and Indiana University in the US (AMPATH) in the area of HIV/AIDS management. Another model is the linkage between Jomo Kenyatta University of Agriculture and Technology (JKUAT) and Syngenta

on crop protection in which the linkage involves product testing and development and has components of staff exchange, students' placement and joint research. This is a successful example of integrating PhD students into a well-funded research project. However, not all institutions have had such profound effect on addressing societal challenges.

Institutions also need to pay attention to employee expectations of doctoral research training. Interviews with representatives from industry suggested that there is a demand for graduates with a multidisciplinary background. They confirmed that they are keen on complementary skills that could enable graduates to be more multifaceted. This finding supports the recent move by some institutions noted in Section 3.2 to establish multidisciplinary PhD programmes. However, as a cautionary note, PhD students themselves may be motivated by considerations that differ from industry expectations. For example, most of the doctoral graduates interviewed mainly wanted to pursue academic careers within the universities. This suggests that it will be difficult for universities to align the thematic priorities of their PhD programmes more closely to industry needs.

6. Funding research and PhD training

6.1 National and international sources of funding

The government of Kenya has prioritised research funding to achieve industrialisation as outlined in Kenya's Vision 2030. Kenya is signatory to the African Union's protocol that obliges member states to commit one per cent of their GDP to support scientific research (MoE, 2016). The government has taken the initiative to scale up funding for science, technology and innovation. The *National Research Fund* established under the Science, Technology and Innovation Act 2013 aims to facilitate research for the advancement of science, technology and innovation. Kenya's current allocation for research amounts to 0.8 per cent of the country's GDP, an amount that is negligible compared to the country's research needs and potential. In acknowledging that the current investments in research and development remain low, the government has committed to increase research funding to two per cent of GDP through partnership with key stakeholders including the private sector and foundations. The Kenyan government has been allocating \$4 million annually to finance research and innovations since 2008. The challenge is to establish how much of this is invested in education, specifically PhD training, and what the government perceives of PhD training as an aspect of development and building capacity in research.

The *Higher Education Loans Board* (HELB) is a state corporation under the Ministry of Education. It is a revolving fund from which funds can be drawn to lend to needy Kenyan students

pursuing higher education. It disburses loans, bursaries and scholarships to students pursuing higher education in Kenya. HELB provides loans for salaried students undertaking PhD, master's and undergraduate studies, postgraduate bursaries for the extremely needy students, and scholarship awards offered at two levels – the postgraduate scholarship awarded to students pursuing their master's or doctoral studies – and based on academic merit.

The *German Academic Exchange Service* (DAAD) is the only international agency which runs a scholarship scheme supporting master's and PhD studies (fees and stipends) at selected top-quality institutions in the home country or the wider Sub-Saharan Africa, known as the In-Country and In-Region Scholarship schemes. The scholarship schemes are available to students of most Sub-Saharan African countries. In East Africa alone, between 2015 and 2017, 300 scholarships were awarded per year, approximately half of them for PhD students.

6.2 Institutional and student experiences related to funding

PhD students in Kenya are required to fund their studies privately or seek funding and scholarships. The majority of students employed by universities have grants or scholarships that are set aside for faculty who are pursuing their PhD programmes with a view to providing opportunities for staff development and capacity building within the institution. Importantly, what emerged from the questionnaire data was that in most of the institutions only a small percentage of the

students' tuition and research fees was met by the universities in which they are teaching. For example, staff undertaking PhD studies at Moi University receive an average of \$1,500, which is only about a third of what they need for tuition fees alone, while the staff of Pwani University are given a full scholarship. The former group argue that this contributes a great deal to the slow pace of PhD study because often these lecturers still have a full teaching load.

Alternative sources of funding cited (in order of prevalence) comprised (a) government agencies like HELB, NRF and NACOSTI; (b) their employers through the staff development fund; and (c) local donors and international donors (in the form of exchange programmes, research project funding, stipends and scholarships from various NGOs). Besides these sources, the two other sources of funds that ranked lowest in all the institutions were the regional government, industry and the business sector. Apart from these sources of funds, some departments and faculties said that they provide financial support for their PhD students in the following ways: departmental internal research fund, waiver of fee for tutorial fellows on PhD programmes; subsidised fees for other academic faculty members; research and support grants for students; and savings from the Privately Sponsored Students Programme (PSSP) fund. However, it is necessary to note, whichever the source, they all acknowledged that the funding was not sufficient.

7. The role of international collaboration in building PhD capacity

7.1 Overview

The quality of programmes, funding challenges, deficits in supervision and research productivity could be enhanced through international collaborations. There is evidence in a number of the participating institutions such as Moi University, JKUAT and University of Nairobi that international collaborations can contribute very significantly in developing human resource capacities especially through specialised training and a state-of-the-art supervision of PhD and master's students.

7.2 Bilateral models

Evidence from the document reviews showed that international organisations such as UIS (2007), FAO, DAAD, the British Council, RUFORUM, CARTER, Afrique One Alliance, OSSREA (2001), and WHO have partnered with a number of universities in providing funding and training for PhD students in advanced research methodology. Furthermore, it is noted that one of the most common areas of collaboration is university–university linkages for both the public and private universities with international universities engaging PhD faculty and student exchange programmes, providing support for joint research projects and offering faculty members opportunities to upgrade their skills through faculty internship programmes. Many universities have benefited tremendously from such international projects. Below we provide examples from Moi University, University of Nairobi, the United States International University and the impact of the collaborations.

In Moi University, the MHO project funded by the Netherlands Ministry of Foreign Affairs among other aspects contributed to the training of 40 doctoral graduates, most of whom returned to work at the university. The VLIR-OUS project funded by Flemish Universities in Belgium supports capacity building at Moi University in engineering, agriculture and biotechnology and in textile research and extension. The Academic Model for Providing Access to Healthcare (AMPATH) brings together leading North American medical faculties led by the Indiana University School of Medicine to work with Moi University on health-related research and training. These are among the several other partnerships that the university has developed. Apart from setting up and facilitating an office to co-ordinate these international activities, the university has also developed a strategy for its internationalisation activities.

The Centre for International Programmes and Links at the University of Nairobi manages their portfolio of international collaborations which have contributed enormously to developments at the university. The deputy vice-chancellor responsible for research and extension at the University of Nairobi emphasised the need for mutual collaboration mainly focused on research and which could also enhance the academic status of the university.

The United States International University co-ordinates the Carnegie Africa Diaspora Fellowship Program, which supports staff exchanges for African scholars in North America and

enables scholars in the diaspora to spend some time in African universities.

The IUCEA has also established new programmes that facilitate collaborations among universities within the region. This is in addition to the initiatives of several other continental organisations such as the Council for the Development of Social Science Research in Africa and the Organization for Social Science Research in Eastern and Southern Africa. Kenya also hosts a number of international research centres that could make a contribution to supporting research and doctoral training. Among these are the International Livestock Research Institute, the Africa Population Health Research Centre, the International Centre of Insect Physiology and Ecology, the International Crops Research Institute for the Semi-Arid Tropics, and the African Economic Research Consortium.

7.3 Multilateral models

Kenya also hosts a number of international agencies which have contributed in different ways to supporting research and doctoral training. The German Academic Service (DAAD) for instance has supported the establishment of the *East and South African-German Centre of Excellence for Educational Research Methodologies and Management* bringing together Moi University, Nelson Mandela Metropolitan University in South Africa, Uganda Management Institute and the University of Dar es Salaam to strengthen research, teaching and staff development with specific expertise in educational and

management sciences. A similar centre with a focus on mining engineering has just been inaugurated at Taita Taveta University (Voi). The African Science Partnership for Intervention Research Excellence is another organisation involved in capacity development for PhDs is Afrique One-ASPIRE. In 2016 Afrique One-ASPIRE (African Science Partnership for Intervention Research Excellence) sought to recruit five postdoctoral research fellows, 15 PhD fellows and 18 master's fellows. Fellowships are designed to cover five thematic training programmes within the consortium. In this project, Kenya has two PhD fellows. Afrique One Alliance has the objective of building Pan-African research capacity in health.

Another innovative model is that of the *Consortium for Advanced Research Training in Africa* which has been supporting the development of PhD training in Kenya since 2010. It has so far trained over 140 PhD fellows and 24 doctoral students have already graduated from an innovative consortium arrangement built on a merit-driven system. This study noted that the training of doctoral and post-doctoral fellows adopts the use of joint advanced seminars. These are residential and planned to enhance the fellows' skills and knowledge. The course includes the preparation of fellows for the research process and guidance on how to establish a community of researchers, peers and mentors. It is noted that 'the formal trainings during JAS are

complemented by inter-JAS activities that encourage fellows to stay connected and engage with peers and mentors as part of an online community of practice and graduate in a timely manner'.

In addition to such innovative approaches, there are also regional discipline-based organisations such as the *Regional Universities Forum for Capacity Building in Agriculture* (RUFORUM) based in Kampala, Uganda which brings together 66 African universities operating within 26 countries to improve the quality of higher education at African universities by increasing the proportion of academic staff with PhD qualifications, contributing to locally relevant research and reducing the time away from the home institution. The specific objectives of the Graduate Teaching Assistants (GTA) are to:

1. Improve the quality of higher education and increase the pool of PhD-level trained academic staff in African universities.
2. Provide opportunities for the doctoral research to contribute more directly to African development.
3. Strengthen inter-university collaboration in the field of higher education in Africa.
4. Promote staff mobility among RUFORUM member universities, and across Africa.

7.4 Internationalisation strategies of Kenyan institutions

Otieno et al. (2008: 247) note that 'most universities in Kenya have had the experience of utilising these international collaborations for institutional capacity development and strengthening research capacity'. The various universities studied mainly displayed internationalisation in the following ways: student exchange programmes, faculty exchange, different levels of partnerships and linkages in research activities; and the establishment of campuses and university colleges both in different parts of the country and outside the country. For instance Kenyatta University, JKUAT and Mount Kenya University have established campuses in Rwanda. There are also growing numbers of international students in Kenyan universities including at PhD level especially from the neighbouring countries (Njuguna and Itegi, 2013). Kenya also hosts one of the Pan-African University Centres of Excellence based at JKUAT through which several students from Africa are trained at postgraduate level especially in STEM-related subjects.

8. Conclusion

The availability of PhD training in Kenya has witnessed growth over the last ten years with regard to the number and variety of PhD programmes being offered. The growth has been motivated by market demand for more highly trained manpower and the national need to expand higher education provision, leading to the establishment of more institutions across the country. Despite this growth, the number of PhD students remains relatively low.

The analysis of the different research priorities in the various institutions presents a common direction in research policies and procedures. Facilities for PhD training in most of the institutions are barely sufficient for effective training. Those that are available in each of the institutions vary greatly depending on the nature of PhD programmes being offered and other unique institutional factors. Furthermore, there is a lack of adequately qualified and experienced academic staff to effectively drive the process of PhD training and research in Kenya. In addition, the supervision process is challenged by varied institutional, supervisee and supervisor factors which slow down the process.

Despite the common PhD thematic areas of training in the various institutions of higher learning, there are variations which render each of the institutions sampled in the study unique. Unlike the similarities in the graduate training process, the nature and type of graduate programmes vary considerably depending on the academic thematic orientation of an institution. Some are determined by the geographical/physical setting of the university and others by the initial

mother institutions that led to their establishment. This provides for a variety of programmes from which the PhD applicants can select.

The research agenda of each institution is geared towards the attainment of the Kenya national research and development agenda as portrayed in Vision 2030, and adherence to the CUE regulations and the Universities Act 2012 on the provision of given graduate programmes. The study concludes that the introduction of new PhD programmes is a feature of academia driven by the institutions to meet the national research agenda, policy and strategy for development, such as Vision 2030, the MDGs and now the SDGs.

Based on the review of the research policies of the various institutions engaged in the study, there is visible evidence of efforts being made to link research activities and PhD training to the national agenda through the various national-level systems. Although not strong, evidence from this study indicates that universities in Kenya are strengthening the link between community, industry, institutions, and research and PhD training. We conclude that PhD training within the perspective of research for community development can help Kenya meet some of the goals expressed in the SDGs. However, as noted by some previous studies in this area, there is an urgent need for the universities to enhance collaborative research with research institutes in Kenya, namely KEMRI, International Centre of Insect Physiology and Ecology, KEFRI, International Livestock Research Institute, ICRAF, CIP, ICRAST, CABI and KARI (now KARL), among

others. This would enhance the use of research to meet the national and international agenda.

There are limited sources of funding to support and sustain PhD training in Kenya; consequently, it is apparent that all PhD students are required to put some private funds towards their studies or seek funding and scholarships at an individual rather than institutional level. The available grants or scholarships within the institutions are set aside for faculty who are pursuing their PhD programmes with a view to providing opportunities for staff development and capacity building within the institution. However, at national level some national agencies like HELB, NACOSTI and NRF make provision for limited PhD scholarships and research funds that are competitively awarded.

High-level research in Kenya is mainly funded from international sources. Good-quality PhD training has been a feature of collaboration with international networks or regional research centres highly dependent on international support. This, it is hoped, will change with allocation of more funds to NRF. It is important to note that most institutions primarily engage in collaborations for the purposes of international visibility and student exchange programmes and the other activities are built up as the collaborations become established. This suggests that programmes aimed at building PhD capacity can succeed in those instances where departments and faculties have pre-existing international links, and where they are supported by a clear institution-level internationalisation strategy.

9. Recommendations

The government and higher education institutions should take advantage of the current expansion of the higher education sector to build quality doctoral programmes, and to produce more doctoral graduates to bridge the current deficits in the system. Though staffing of the new programmes is a challenge, opportunities such as staff in the diaspora could be attracted back through better remuneration to fill in the capacity gaps at home. At the same time the government and the institutions must have it as a priority to train and retain high numbers of young scholars who can serve the system productively for a longer period of time.

In order to broaden the link between research activities and PhD training to the national agenda through various national-level systems, the scope of the research policies of the various institutions should be expanded to link directly to the national goals, focusing the provision on the specific aspects of the social pillar in Vision 2030 and on the SDGs. Government should have platforms for interactions with the universities to share their goals and aspirations which should guide universities on the expectations of governments. Such fora should also enable government to come to terms with the challenges and realities that universities face especially with regard

to research and PhD training. The exhibitions annually organised by the CUE provide a useful avenue for the universities to demonstrate to different stakeholders, including government, on the innovations they are making through their research.

It was noted that more than half of the PhD graduates in the system are from business and administration, the arts and social science disciplines. It was further noted that one of the reasons behind this was the high cost associated with establishing doctoral programmes in the natural science disciplines in addition to the deficits in staff capacities. Efforts should be made to ensure that more doctoral programmes are established in the science and technology areas which have not received adequate attention. As some respondents recommended, it would also be useful to adapt multidisciplinary research and training programmes for efficient sharing and utilisation of available capacities and also in response to labour market demands for complementary skills allowing for multi-tasking in the workplace.

Though there are a number of reforms underway, quality challenges still characterise PhD training in the system. While taking cognisance of the fact that these challenges are immense, universities could make improvements

in areas that are feasible even in the short term. Through CUE, the government has already taken useful steps, including closing down campuses that universities had set up across the country, and setting up regulations for academic staff qualifications and promotions, and guidelines on thresholds needed to set up new academic programmes among others. CUE now insists that institutions should ensure that the minimum quality standards are maintained and sustained. This has been extended to campuses outside the borders of Kenya: JKUAT have had to close their campus in Rwanda. This should be through different quality assurance frameworks in addition to an institutional infrastructure to support research, training and the needs of the PhD students. The institutions should further make efforts through the support of the government to develop or source more qualified academic staff to strengthen their academic quality. The staff should match the ratio of enrolled PhD students in order to enhance the quality and process of PhD training and research in Kenya. In addition, more stringent regulations should be set by the various institutions of higher learning to ensure the eradication of the challenges to the supervision process at all levels.

In order to provide a greater variety of PhD training options the higher education institutions need to differentiate and diversify their programmes to cover different but strategic areas, most of which may not be currently on offer. Each institution should explore and develop a unique edge in research and doctoral training. This may require that they review their strategies and plans to fit this recommended differentiation within the framework of the national agenda and the SDGs.

While Kenyan universities have created several international partnerships that have helped develop capacities for research and doctoral training, more could still be attained. University linkages and partnerships should lead to progressive and innovative institutions whose mandates are informed and enriched by the experiences, expertise and resources of these partners with a focus on PhD training and research advancement. The partners, on the other hand, will be able to gain by tapping the intellectual and creative energy of Kenyan universities. The overall achievement of these partnerships should be the production of more relevant knowledge and skills for social and economic development. Furthermore, there is a need to review

the legal framework, protocol and conventions that guide linkages with international research organisations to allow for more collaboration with the universities and for local researchers to do away with the disconnect between the local research environment and experts from international collaborations. There are several examples cited in the study demonstrating how such partnerships could enhance capacities for research and PhD training. Institutions of higher learning in Kenya should create more opportunities for international collaboration and widen the scope for engaging in these collaborations beyond international visibility and student exchange programmes in order to take advantage of other forms of collaboration inclined toward effective PhD training and the enhancement of academic staff development. Funding is a perennial problem facing the Kenyan higher education system, including its research and PhD training. While government is trying to support research and PhD training, these efforts are meagre compared to the existing needs. Kenyan universities must devise alternative ways of augmenting government funding. At the same time, the government has to give more concrete support to research and PhD training. The establishment of the NRF is a step in the right direction.

Universities need to work out ways of establishing dependable sources of funding that can be utilised to facilitate PhD students' training and research through the provision of scholarships for individuals. The available grants or scholarships for faculty who are pursuing their PhD programmes should be utilised to provide opportunities for staff development and capacity building to increase the number of qualified staff to engage in effective PhD training. In addition, national agencies like HELB, NACOSTI and NRF should increase their PhD scholarship and research fund awards.

The new development with centres of excellence in research and doctoral training is already starting to deliver formidable outcomes. Universities could maintain this trend and develop strategic consortia with partners with better capacities so that they can benefit from the synergies to train more doctoral graduates and also enhance research productivity.

References

- Commission for University Education (CUE) (2015) Accredited Universities in Kenya. Available online at: www.cue.or.ke
- Commission for University Education (CUE) (2016) Accredited Campuses of Universities in Kenya. Available online at: www.cue.or.ke
- Elsevier and World Bank (2014) *A Decade of Development in Sub-Saharan African Science, Technology, Engineering & Mathematics Research*. [Working Paper No 91016.] Available online at: <http://documents.worldbank.org/curated/en/237371468204551128/pdf/910160WP0P126900disclose09026020140.pdf>
- INASP (2012) *Research Environment Study: Kenya, Malawi, Pakistan, and Bangladesh*. International Network for the Availability of Scientific Publications (INASP): Oxford
- Jowi, JO and Obamba, MO (2013) *Research and innovation management: A comparative analysis of Kenya, Ghana, and Uganda*. Report prepared by the African Network for the Internationalization of Education for the OECD: Paris.
- Kenya (2005) *Sessional Paper No. 1 of 2005 on the Policy Framework for Education Training and Research*. Nairobi: Government Printers.
- Kenya Government (2007) 'Kenya Vision 2030: A globally competitive and prosperous Kenya'.
- Kenya Government (2009) *National Science Technology and Innovation Policy and Strategy*. Nairobi: Ministry of Education Science and Technology (MoHEST).
- Kenyatta University Graduate School (2012) *A handbook for postgraduate students* (2nd ed.). KUP. Available online at: www.ku.ac.ke/
- Ministry of Education, Science and Technology (MoE) (2016) 'Kenya fast-tracks establishment of a national research fund'.
- Mukhwana, E, Oure, S, Too, J and Some, DK (2016) State of Postgraduate Research Training in Kenya. Commission for University Education. Discussion Paper 02. Nairobi, Kenya.
- National Assembly of Kenya (2012) Universities Act No. 42 of 2012. Nairobi: National Assembly.
- National Assembly of Kenya (2013) *Science Technology and Innovation Act 2013*. Kenya National Assembly.
- NEPAD (2010) *Africa Innovation Outlook 2010*. Addis Ababa: New Partnership for Africa's Development (NEPAD).
- Ng'ethe, JM, Iravo, ME and Namusonge, GS (2012) Determinants of Staff retention in public universities in Kenya: Empirical review. *International Journal of Humanities and Social Sciences* 2/13: 105–212.
- Njuguna, WF and Itegi, FM (2013) Cross-Border Higher Education in Africa: The Kenyan Experience. Available online at: <http://jeteraps.scholarlinkresearch.com/articles/Cross%20Border.pdf>
- Ogada, TM (2000) Universities, research and development organizations and intellectual property: General overview of the links between education, research, public interest and intellectual property right. Paper presented at Regional Seminar on the benefits of the intellectual property system for universities, university researchers and research and development organization. Dar es Salaam, Tanzania, 20–22 June 2000.
- Otieno, JJ, Kiamba, C and Some, DK (2008) 'Kenya', in Knight, J and Teferra, D (eds) *Higher Education in Africa: The International Dimension*. Accra/Boston: AAU/CIHE.
- OSSREA (2001) *The role of social science research in social, political, and economic transformation in Kenya*. A Report of a Workshop organised by the Organisation of Social Science Research for Eastern and Southern Africa.
- Public Universities Inspection Board (2016) *Transformation of higher education and training in Kenya to secure Kenya's development in the knowledge economy: report of the Public Universities Inspection Board*. Nairobi: Republic of Kenya.
- Republic of Kenya, (1981) *Second University in Kenya: Report of the Presidential Working Party*. Nairobi: Government Printers.
- Tijssen, RJW (2007) African contribution to the worldwide research literature: New analytical perspectives, trends, and performance indicators. *Scientometrics* 17/2: 303–327.
- UNESCO Institute for Statistics (UIS) (2007) *Global expenditure on research and development*. UIS Factsheet. Paris: UNESCO Institute for Statistics.

