Universities and Economic Development in Africa

CASE STUDY:
Kenya and University of Nairobi

Tracy Bailey, Nico Cloete and Pundy Pillay

HERANA   CHET

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Acknowledgements

This study would not have been possible without the support and participation of the following organisations and individuals:

University of Nairobi contacts

- Mr Samuel Kiiru for his assistance in providing background information on the university and scheduling interviews.
- Mr Bernard Waweru for providing the academic core data for the university.

Interview respondents at the University of Nairobi

Mr Ben Waweru (Academic Registrar), Prof. IM Mbeche (Principal: College of Humanities and Social Sciences), Prof. EHN Njeru (Dean: Faculty of Arts), Prof. Edward K Mburugu (Associate Dean: Faculty of Arts), Prof. Patts Odira (Dean: School of Engineering), Prof. Madara Ogot (Managing Director: University of Nairobi Enterprises and Services), Prof. Eric O Odada (Programme Director: Pan African START Secretariat), Prof. Dorothy McCormick (Institute for Development Studies), Mr John Njoka (Institute for Development Studies), Prof. Winnie Mitullah (Institute for Development Studies), Prof. NJ Muthama (Department of Meteorology), Prof. Francis Mutua (Hydrometrology and Surface Water Resources Unit), Prof. Njuguna Ng'ethe (Chronic Poverty Research Centre), Prof. John H. Ndiritu (Dean: Faculty of Agriculture), Dr Wanjiru Gichuhi (Population Studies and Research Institute), Mr Samuel W. Kiiru (Institute for Development Studies).

National stakeholder: Elizabeth Wafula (Senior Assistant Commission Secretary (Planning), Commission for Higher Education)

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Network	Higher Education Research and Advocacy Network in Africa (HERANA)

Acronyms and abbreviations

CHE	Commission on Higher Education
CHET	Centre for Higher Education Transformation
CPRC-K	Chronic Poverty Research Centre – Kenya
DFID	Department for International Development
FTE	Full-time equivalent
GCI	Global Competitiveness Index
GDP	Gross domestic product
GER	Gross enrolment ratio
GII	Global Innovation Index
HERANA	Higher Education Research and Advocacy Network in Africa
ICSU	International Council for Science
IDRC	International Development Research Centre
ILO	International Labour Organisation
KES	Kenya Shilling
KESSP	Kenya Education Sector Support Programme
MDG	Millennium Development Goal
MEST	Ministry of Education, Science and Technology
MHEST	Ministry of Higher Education, Science and Technology
NGO	Non-governmental organisation
PPP	Purchasing power parity
R	South African Rand
R&D	Research and development
SET	Science, engineering and technology
SME	Small and medium enterprise
STI	Science, technology and innovation
TIVET	Technical, industrial, vocational and entrepreneurship training
UKZN	University of KwaZulu-Natal
UNES	University of Nairobi Enterprises and Services
UoN	University of Nairobi
USD	United States Dollar
WEF	World Economic Forum

Glossary of terms

Academic core

The academic core refers to a university's academic degree programmes and research activities.

Gini co-efficient

The Gini co-efficient is a standard economic measure of income inequality, based on the Lorenz Curve. It ranges from zero (which indicates perfect equality, with every household earning exactly the same), to one (which implies absolute inequality, with a single household earning a country's entire income).

Global Competitiveness Index (GCI)

The World Economic Forum (WEF) defines competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. The GCI uses this definition to establish a quantitative tool to help policy-makers benchmark and measure the competitiveness of a given country. The GCI is based on 12 pillars of competitiveness further divided into three pillar groups, which are:

- Basic requirements (institutions, infrastructure, macro-economic stability, health and primary education);
- Efficiency enhancers (higher education and training, goods market efficiency, labour market efficiency, financial market sophistication, technological readiness, market size); and
- Innovation and sophistication factors (business sophistication, innovation).

Global Innovation Index (GII)

The GII assesses in detail the extent to which different economies benefit from the latest innovation advances, based on three main principles:

- There is a distinction between enablers (inputs) and outputs while measuring innovation in an economy. Enablers are aspects that help an economy to stimulate innovation and outputs are the results of innovative activities within the economy.
- There are five enabler pillars that are included in the GII: institutions, human capacity, general and information and communications technology infrastructure, market sophistication, and business sophistication. The enabler

pillars define aspects of the conducive environment required to stimulate innovation within an economy.

- The two output pillars which provide evidence of the results of innovation within the economy are scientific outputs and well-being.

Gross domestic product (GDP)

The GDP is the total market value of all final goods and services produced in a country in a given year, which equals total consumers, investment and government spending, plus the value of exports, minus the value of imports. Changes in the GDP on an annual basis provide a measure of economic growth.

Gross enrolment ratio (GER)

The GER indicates the total enrolment in a specific level of education, regardless of age, expressed as a percentage of the official school-age population, corresponding to the same level of education in a given school year. The GER is calculated by dividing the number of pupils (or students) enrolled in a given level of education, regardless of age, by the population of the age group which officially corresponds to the given level of education, and multiplying the result by 100. The GER is widely used to show the general level of participation in a given level of education. It indicates the capacity of the education system for enrolling students of a particular age group. It is used as a substitute indicator to Net Enrolment Ratio (NER, outlined below) when data on enrolment by single years of age are not available. The GER can also be a complementary indicator to the NER by indicating the extent of over-aged and under-aged enrolment.

Human Development Index (HDI)

The HDI is a summary composite index that measures a country's average achievements in three basic aspects of human development. These include the following:

- Health (measured by life expectancy at birth);
- Knowledge (measured by a combination of the adult literacy rate and the combined primary, secondary, and tertiary GER); and
- A decent standard of living (measured by GDP (income) per capita).

The HDI was created to emphasise that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth.

Pact

A 'pact' is defined by Gornitzka *et al.* (2007: 184) as "a fairly long-term cultural commitment to and from the University, as an institution with its own foundational rules of appropriate practices, causal and normative beliefs, and resources, yet validated by the political and social system in which the University is embedded. A pact, then, is different from a contract based on continuous strategic calculation of expected value by public authorities, organised external groups, university employees, and students – all regularly monitoring and assessing the University on the basis of its usefulness for their self-interest, and acting accordingly."

Purchasing power parity (PPP)

The PPP is a rate of exchange that accounts for price differences across countries, allowing international comparisons of real output and incomes. At the PPP\$ rate used in this report, PPP\$ has the same purchasing power in the domestic economy as USD 1 has in the US.

Higher Education and Economic Development Publications

The eight case study reports in this series contain the detailed data and analysis for each country and university in the sample. Together, they form the empirical basis for the analysis and discussion of findings contained in the CHET book, *Universities and Economic Development in Africa,* which was published in August 2011. While every effort has been made to check the data and edit the text in the time available, it should be noted that these case study reports have not been subjected to the publishing rigours of formally published publications. They are therefore made available 'as is'.

Higher education and economic development: A literature review
Pundy Pillay (2010)

> This report reviews the international literature on the relationship between higher education and economic development. The review focuses on previous research and theory on the link between higher education and economic growth, the knowledge economy, innovation, and local and regional development. The review would be of interest to academics and students who work in the field of higher education studies.

> Click here to download a copy of this report.

Linking higher education and economic development: Implications for Africa from three successful systems
Pundy Pillay (2010)

> This book synthesises the findings of case studies of three systems – Finland, South Korea and North Carolina in the US – that have successfully linked higher education to their economic development initiatives. This publication would be of particular interest to policy-makers and funders.

> Click here to download a copy of this report.

Universities and economic development in Africa
Nico Cloete, Tracy Bailey, Pundy Pillay, Ian Bunting and Peter Maassen (2011)

> This report presents the key findings from each of the eight African case study reports and synthesises these within the analytical framework of the larger study. This publication would be of interest to national policy-makers, international agencies, funders and university leadership.

> Click here to download a copy of this report.

Part 1

Introduction

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AT A GLANCE

- Overview of HERANA
- Project focus and process
- Analytical framework
- Data collection
- Focus and structure of the report

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1.1   Introduction to the Higher Education and Economic Development project

1.1.1   Overview of HERANA

The Higher Education and Economic Development project forms part of the work of the Higher Education Research and Advocacy Network in Africa (HERANA). HERANA was established in 2007 and is coordinated by the Centre for Higher Education Transformation (CHET) in Cape Town, South Africa. Key partners include the University of the Western Cape (South Africa), Makerere University (Uganda) and the University of Oslo (Norway).

The research component of HERANA investigates the complex relationship between higher education and development in Africa, with a specific focus on economic and democratic development. A second research area explores the use of research in policy-making. Alongside the research component is an advocacy strategy that aims to:

- Disseminate the findings of the research projects;
- Coordinate existing sources of information on higher education in Africa,
- Develop a media strategy; and
- Put in place a policy dialogue (through seminars and information technology) facilitating interactions between researchers, institutional leaders and decision-makers.

The capacity-building component of HERANA is the Higher Education Masters in Africa Programme, run jointly between the key partners. The main objective of the project is to contribute to the strengthening of higher education in Africa through building capacity and expertise in African higher education. The students contribute to higher education and development research through the research components of the programme.

The research and advocacy components of HERANA are funded by the Carnegie Corporation of New York, the Ford Foundation, the Rockefeller Foundation and the Kresge Foundation. The Higher Education Masters in Africa Programme is funded by NORAD.

1.1.2   Project focus and process

As a point of departure, the overall aim of the project was to investigate the complex relationships between higher education (specifically universities) and economic development in selected African countries with a focus on the context in which universities operate (political and socio-economic), the internal structure and dynamics of the universities themselves, and the interaction between the national and institutional contexts. In addition, the project aimed to identify those factors (practices, strategies) and conditions (context) – at both national and institutional levels – that facilitate or inhibit universities' ability to make a sustained contribution to economic development.

The project began with a review of the international literature on the relationship between higher education and economic development (Pillay 2010a). This was followed by case studies of three systems which have successfully linked their economic development and higher education policy and planning – Finland, South Korea and the North Carolina state in the US (Pillay 2010b).

The next phase of the project involved the collection of data at both the national and institutional levels in the eight African countries and universities included in the study:

- Botswana – University of Botswana
- Ghana – University of Ghana
- Kenya – University of Nairobi
- Mauritius – University of Mauritius
- Mozambique – Eduardo Mondlane University
- South Africa – Nelson Mandela Metropolitan University
- Tanzania – University of Dar es Salaam
- Uganda – Makerere University

The countries included in the study were selected for three main reasons: on the basis of previous collaboration; being located in sub-Saharan Africa; and, on the basis of World Economic Forum (WEF) ratings regarding participation in the knowledge economy in the African context. In each of the collaborating countries the national university was selected, except in South Africa where the Nelson Mandela Metropolitan University was regarded as a more 'comparable' institution.

Semi-structured interviews were conducted with a wide range of individuals in each country, including selected ministries, commissions/councils for higher education and other stakeholders at the national level; and, institutional leadership, heads of development-related projects and centres, and academic

and administrative staff. The analysis also draws on various policy and strategy documents (national and institutional levels), as well as quantitative data including national development indicators and statistics relating to the higher education systems and universities in the sample.

Throughout the project process, dissemination and advocacy activities have taken place. These have included seminars in many of the African countries in the sample and in Norway, as well as dissemination via the HERANA web site[1].

1.1.3   The analytical framework for the study

In the knowledge economy, universities are considered to be key institutions for the production of high-level skills and knowledge innovation, based on the traditional core business of universities – the production, application and dissemination of knowledge.

In many countries, higher education has become one of the central areas in the government's knowledge policies. This means that more policy/political actors than the Ministry of Education, as well as socio-economic stakeholders (employers' organisations, funders and research councils), have become interested in higher education and involved in higher education policy. This raises the issue of system- and institutional-level coordination of knowledge policies with adequate structures and processes within the political system, most notably the capacity to coordinate different political activities of the governing of knowledge production, reproduction and coordination.

As mentioned earlier, to get a better understanding of the relationship between higher education and development, the research group undertook three case studies (Finland, South Korea and North Carolina state) where there is a well-established integration of higher education in national development strategies. Of particular interest to our study was to answer the question: What is it about these three systems that enable them to successfully link higher education to economic development? Put another way: What are the core conditions that are present in each of the three systems that enable their higher education sectors to successfully and sustainably contribute to development?

Common to all three systems was a strong, agreed upon framework for economic development aimed at realising an advanced, competitive knowledge economy, and the important role for higher education in this regard. Despite major contextual differences, the three systems exhibited the following conditions for harnessing higher education for economic development:

- Their higher education systems had been built on a foundation of equitable and quality schooling. There was also an emphasis on achieving high quality higher education.
- They had achieved very high higher education participation rates.

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[1] HERANA web site: http://www.chet.org.za/programmes/herana/.

- Their higher education systems were differentiated (institutional and public/private) as part of achieving their human capital, research and innovation objectives for economic development.
- Their governments ensured a close link between economic and (higher) education planning.
- There were effective partnerships and networks between the state, higher education institutions and the private sector to ensure effective education and training, and to stimulate appropriate research and innovation.
- There was strong state involvement in a number of other respects including, for example, adequate state funding for higher education; using funding to steer the higher education sector to respond to labour market requirements; and, incentivising research and innovation in the higher education sector.

Drawing on the review of literature (Pillay 2010a), the implications from the case studies of three successful systems (Pillay 2010b), and preliminary observations from the eight African case studies, we formulated the following analytical propositions:

1. A condition for universities' contributions to development is the existence of a broad pact between government, universities and core socio-economic actors about the nature of the universities' role in development.
2. As a core knowledge institution, the university can only participate in the global knowledge economy and make a sustainable contribution to development if its academic core is quantitatively and qualitatively strong.
3. For linking universities effectively to development a country needs various forms and methods of knowledge policy coordination. In addition, the connections between the larger policy context, universities and development are crucial.

The analytical point of departure for our model is, therefore, that the conditions under which each university in Africa, as elsewhere, is contributing to economic development are influenced by the following three inter-related factors:

- The nature of the **pact** between the universities, political authorities and society at large;
- The nature, size and continuity of the university's **academic core**; and,
- The level of **coordination**, the effectiveness of implementation, and **connectedness** in the larger policy context of universities.

These, in turn, are influenced by local circumstances, for example, the nature of the economy of a country, and its political and governance traditions and culture; institutional characteristics, including the 'loosely-coupled' nature of higher education institutions; and, the external relations of universities, especially with national authorities, foreign agencies and industry.

These analytical propositions give rise to the following sets of research questions:

- To what extent is there agreement (a pact) between key stakeholders about the role of higher education, and to what extent does this include a specific role for higher education in economic development? Is there a role for knowledge production and for universities in the national development plan?
- What policies, funding, structures and incentives are in place at the national and institutional levels which give expression to the role of higher education in economic development? To what extent is there coordination of these activities between the different national authorities, and between the national authorities, institutional stakeholders and external agencies?
- What is the strength of the academic cores of the national ('flagship') universities?
- Are development activities in the universities connected to external groupings and do these activities strengthen or weaken the academic core?

This report presents the data that address these questions in the Kenyan context generally, and with specific reference to the University of Nairobi (UoN). The analytical framework of the study is elaborated further in Part 6 which discusses the key findings for this case study.

1.1.4   What the project is not doing

As can been seen from the analytical framework of the project, this study has a considerable scope. However, the project is not attempting to do the following:

- Measure or evaluate the extent to which universities are contributing to development, or the impact that their activities have on development in their respective countries.
- Include an assessment of the impact or effectiveness of specific institutional policies, units or development projects.
- Review the number or nature of donor projects, or an examination of the overall contribution of particular external donors to university development.
- Assume or assert that the primary role for higher education is development, but rather seeks to investigate the factors that either facilitate or inhibit the possible contributions that universities can make to development.

1.2   Data collection for the Kenyan case study

A wide range of data sources have been consulted for the purposes of developing this case study. In order to prepare for the research team's visit to Kenya, CHET obtained a letter of cooperation from the vice-chancellor of the University of Nairobi (UoN), who also approved the selection of Mr Samuel Kiiru (Institute of Development Studies) as our Institutional Contact and Facilitator. The next step was to request background information on the Kenyan higher education system and the university from Mr Kiiru. In addition to the background information, Mr Kiiru was asked to assist in the scheduling of interviews for the research team and, together with the relevant institutional leadership, to identify 5–10 projects that related to either economic development or poverty reduction.

The research team visited Kenya in June 2009 to conduct interviews with national and institutional stakeholders. The national stakeholder was from the Commission for Higher Education. The institutional stakeholders at the UoN included institutional leaders, senior academics and project leaders. The full list of interviewees is provided in Appendix 1.

In addition to the site visit and interviews, a range of national and institutional documents has been consulted. These are listed in the list of sources. In developing the case study report, additional information was gleaned from the internet as well as further correspondence with interviewees to verify information and fill in gaps.

Finally, during July and August of 2010, the first draft of this report was emailed to the vice-chancellor, the project leaders and other key institutional stakeholders at UoN with a request to provide written feedback on the accuracy of the information and interpretation of data contained in the report. In addition to the written feedback received from a number of individuals, formal feedback was obtained from two university representatives during a seminar in Franschhoek, Cape Town, in August 2010.

1.3   The focus and structure of this report

This report pulls together a wide range of data on the national development context and the higher education system in Kenya, as well as the UoN, in order to address the key research questions. The structure of the remainder of the report is as follows:

In Part 2, we provide background and contextual information about Kenya – its economic development and global competitiveness ratings, its approach to economic development policy and planning, as well as the size and shape, governance, policy and financing of the higher education system. A brief profile of the UoN is also provided including key moments in the development of the institution, its governance structure and strategic objectives, and the institutional finances.

In Part 3 of the report, we turn to the role(s) of higher education in Kenya – in general, and in relation to economic development – through an investigation of the ways in which both national and institutional stakeholders talk about and conceptualise the role of higher education, the policies which give expression to these notions, as well as the structures and mechanisms for coordination which relate to higher education.

In Part 4 we examine the nature of the academic core at the UoN.

In Part 5, we investigate the UoN's engagement with its key external stakeholders and the incentives for development-related activities. We also undertake an analysis of the selected development projects at the university, with a specific focus on the connectedness between these activities and the academic core. In particular, we explore the articulation of development activities with national priorities and institutional objectives, as well as with external stakeholders, and the extent to which these activities either strengthen or weaken the academic core of the institution.

In Part 6, we provide a summary of the key findings of the report and relate these to the analytical framework and key questions of the study presented in Part 1. This includes a discussion of the nature and extent of the pact around the role of higher education in Kenya; the nature and strength of the academic core of the UoN; the coordination and implementation of knowledge policies at the national level; and the connectedness of development-related activities in the university to external stakeholders and to the academic core.

Part 2

The Kenya case study:
Background and context

AT A GLANCE
- The Kenyan economy and approach to development
- Higher education in Kenya
- A profile of the University of Nairobi

2.1   The Kenyan economy and approach to economic development

2.1.1   Economic development, competitiveness and innovation

Kenya has a population of about 36 million. Its GDP per capita in 2005 was USD 760 (compared to Mauritius USD 5 059, South Africa USD 5 109, Uganda USD 303, Tanzania USD 316 and Mozambique USD 335) (UNDP 2007). In PPP terms (that is, adjusted to take account of what USD 1 will be able to buy in various countries), Kenya's GDP per capita was USD 2 083 (South Africa USD 11 110, Mauritius USD 12 715, Mozambique USD 1 242, Uganda USD 1 454 and Tanzania USD 744). In East Africa, Kenya is by far the richest country in terms of GDP per capita measures (ibid.).

Kenya's level of social development is also much higher than its neighbours. In terms of the Human Development Index (HDI – computed as an average of a country's adult literacy rate, life expectancy and GDP per capita; in other words, encapsulating both social and economic indicators), Kenya is ranked at 148 out of 177 countries in 2005 (compared to Uganda at 154 and Tanzania at 159). Specific country HDI components were as follows: life expectancy (2005): 52.1 years; adult literacy (1995-2005): 73.6%; and combined GER for primary, secondary and tertiary education (2005): 60.6% (ibid.).

Poverty levels for the period 1990-2005 were relatively high, as follows (ibid.): population living below USD 1 a day – 22.8%; population living below USD 2 a day – 58.3%; and, population below national poverty line – 52%.

Table 2.1 compares GDP (or income) per capita and the HDI for the HERANA sample of countries and the three international case studies. The difference between the GDP per capita ranking and its HDI ranking reflects divergence between economic and broader social development, and is often a consequence of inequality in access to income, education, health, etc. For example, South Africa's HDI ranking is 51 places lower than its GDP per capita

ranking, and Botswana's is 65 – these figures are amongst the highest for the countries ranked in this report.

Table 2.1: GDP per capita vs. Human Development Index in sub-Saharan Africa (2007)

Country	GDP per capita (PPP, USD)*	GDP ranking	HDI ranking**	GDP ranking minus HDI ranking
Botswana	13 604	60	125	-65
Ghana	1 334	153	152	1
Kenya	1 542	149	147	2
Mauritius	11 296	68	81	-13
Mozambique	802	169	172	-3
South Africa	9 757	78	129	-51
Uganda	1 059	163	157	6
Tanzania	1 208	157	151	6
Finland	34 526	23	12	11
South Korea	24 801	35	26	9
United States	45 592	9	13	-4

Source: UNDP (2009)

Notes:
*PPP shows a rate of exchange that accounts for price differences across countries, allowing international comparisons of output and incomes. At the PPP$ rate shown in Table 2.1 for the eight HERANA countries, PPP$ 1 has the same purchasing power in the domestic economy as USD 1 has in the US.
**177 countries were ranked. The HDI is a composite index measuring deprivations in the three basic dimensions – a long and healthy life (as measured by life expectancy), access to knowledge (adult literacy, and combined primary, secondary and tertiary education enrolment), and a decent standard of living (GDP or income per capita).

The Kenyan economy can be characterised as a dual economy, having a small, relatively sophisticated urban economy based largely in Nairobi and a large, under-developed rural economy. Economic growth has rarely risen above its potential, averaging 4.4% most recently between 2002 and 2007[2]. Growth of per capita income has also risen moderately at around 2% for most of this decade. The socio-economic challenges for Kenya are many and include raising the economic growth rate substantially to around 7-8% for a sustained period and reducing chronic unemployment and poverty.

According to the *Vision 2030* policy document, under the guidance of the Economic Recovery Strategy for Wealth and Employment Creation, the Kenyan economy has recovered and resumed the path to rapid growth. The economy

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[2] Economy Watch: Kenya: www.economywatch.com/world_economy/Kenya/.

grew by more than 6% in 2007 from 0.6% in 2002 (2.8% in 2003, 4.2% in 2004 and 5.8% in 2005) (GRK 2007: 1).The growth has been widely distributed, covering all economic and social sectors, and resulting in a reduction in poverty levels from 56% in 2002 to 46% in 2006. Also, this growth has not only impacted positively on the indicators of other Millennium Development Goals (MDGs) (e.g. education, health, gender and environment), but has also availed more resources to address the MDGs across the economy. Currently, more resources have been devolved to the local level through such schemes as the Constituency Development and Bursary Funds, the Local Authority Transfer Fund, and the Constituency Aids Fund, among others, to directly address the MDGs at this level (ibid.). Despite the development registered under the Economic Recovery Strategy, the country continues to face challenges in infrastructure and in institutional reforms needed for the highest levels of efficiency in production at firm and household levels.

The economy is also being transformed sectorally with the share of agriculture declining from 38% in the 1960s to 28% in 2004; with manufacturing increasing from 10% to 17%, and services from 52% to 55%, during the same period (ibid.).

In education, serious consideration needs to be given to improving access and equity at all levels. At the higher education level, quality, internal efficiency, gender equity and responsiveness to the labour market are key challenges.

In terms of the WEF's (2010) Global Competitiveness Index (GCI, 2010-11), Kenya is ranked at 106 out of 139 countries. According to the WEF, Kenya is a 'Stage 1 (factor-driven)' economy.

Table 2.2 provides data on quality of the education system, gross tertiary education enrolment rates and global competitiveness, as well as the stage of development of each country's economy. It shows this data both for the HERANA countries as well as the three international case studies. The latter group has tertiary education participation rates and are all 'innovation-driven' economies. Amongst the HERANA countries, there is a strong correlation between tertiary education participation and global competitiveness, on the one hand, and the stage of economic development on the other. The countries fall into two groups. One group (Botswana, Mauritius and South Africa) has relatively high GDP per capita (Table 2.1) and tertiary education participation and is classified as 'efficiency-driven'. The other group, comprising the five other sample countries, has relatively low GDP per capita and tertiary education participation, and is classified as 'factor-driven'. The countries in this latter group are also ranked relatively low in terms of global competitiveness.

Table 2.2: Selected higher education and economic development indicators

Country	Stage of development (2009-2010)[1]	Quality of education system ranking (2009-2010)[2]	Gross tertiary education enrolment rate (2008)	Overall global competitiveness ranking (2010-2011)[2]
Ghana	Stage 1: Factor-driven	71	6.2[5]	114
Kenya		32	4.1[6]	106
Mozambique		81	1.5[3]	131
Tanzania		99	1.5[5]	113
Uganda		72	3.7	118
Botswana	Transition from 1 to 2	48	7.6[4]	76
Mauritius	Stage 2: Efficiency-driven	50	25.9	55
South Africa		130	15.4[4]	54
Finland	Stage 3: Innovation-driven	6	94.4	7
South Korea		57	98.1	22
United States		26	82.9	4

Sources: WEF (2010)

Notes:
[1] Income thresholds (GDP per capita in USD) for establishing stages of development (WEF 2010: 10): Stage 1 Factor-driven: <2 000; Transition from stage 1 to stage 2: 2 000-3 000; Stage 2 Efficiency-driven: 3 000-9 000; Transition from stage 2 to stage 3: 9 000-17 000; Stage 3 Innovation-driven: >17 000.
[2] Ranked out of 139 countries.
[3] 2005 figure.
[4] 2006 figure. The 2010 figure by the Botswana Tertiary Education Council is over 20% while in South Africa the figure remained around 16%.
[5] 2007 figure.
[6] 2009 figure.

Of the 12 pillars of competitiveness that the WEF uses in the derivation of the GCI, two are particularly relevant for the purposes of this study: the 'efficiency-enhancing' 5th pillar, higher education and training; and one of the 'innovation and sophistication' factors, namely innovation. With regard to higher education and training, Kenya fairs relatively well at 85 out of 133 countries compared to its overall ranking of 98. On innovation it ranks very high given its development status, at 48. On 'innovation and sophistication factors', comprising 'business sophistication' and 'innovation' Kenya is ranked at 50, the highest ranked African country after South Africa.

The *Global Competitiveness Report* for 2009-2010 reports on Kenya as follows (WEF 2009: 39):

> *Kenya, ranked 98th, has fallen five places this year, with a weakening especially in its institutional environment. Kenya's*

key strengths continue to be found in the more complex areas measured by the GCI. For example, Kenya's innovative capacity is ranked an impressive 48th, with high company spending on research and development and good scientific research institutions collaborating well with the business sector in research activities. Supporting this innovative potential is an educational system that - although reaching a relatively small proportion of the population compared with most other countries – gets good marks for quality (34th) as well as for on-the-job training (44th). The economy is also supported by financial markets that are sophisticated by international standards (37th), with relatively easy access to loans and share issues on the local stock market.

However, there are a number of basic weaknesses that are eroding Kenya's overall competitive potential. As mentioned above, the countries public institutions are assessed as increasingly inefficient (ranked 117th, down from 100th last year), plagued by undue influence (120th), government inefficiency (101st), and high and rising corruption (116th, down from 101st last year). The security situation in Kenya is also worrisome, particularly in regard to crime and violence (122nd), the potential of terrorism (127th), and the prevalence of organised crime (118th). Health is another area of serious concern (ranked 119th), with a high prevalence of communicable diseases contributing to the low life expectancy of 54 years.

Table 2.3 compares the GCI and Global Innovation Index (GII) for the eight HERANA countries.

Table 2.3: Global competitiveness and global innovation

Country	Global Competitiveness Index (GCI) Ranking*	Global Innovation Index (GII) Ranking**
Botswana	66 (4.08)	86 (2.80)
Ghana	114 (3.45)	105 (2.66)
Kenya	98 (3.67)	83 (2.84)
Mauritius	57 (4.22)	73 (2.93)
Mozambique	129 (3.22)	100 (2.69)
South Africa	45 (4.34)	51 (3.24)
Uganda	108 (3.53)	108 (2.65)
Tanzania	100 (3.59)	98 (2.69)

Sources: *WEF (2009); **INSEAD (2010)

Notes:
1. GCI
   a) The GCI ranks 132 countries, with the top three countries being Switzerland (with a GCI score of 5.60), US and Singapore.
   b) The GCI is derived from three sub-indices and 12 pillars of competitiveness. The three sub-indices are "basic requirements" (with four pillars – institutions, infrastructure, macro-economic stability, and health and primary education); "efficiency enhancers" (with six pillars – higher education and training, goods market efficiency, labour market efficiency, financial market sophistication, technological readiness, and market size); and "innovation and sophistication factors" (with two pillars – business sophistication and innovation). The basic requirements sub-index is considered key for factor-driven economies, the efficiency enhancers are key for efficiency-driven economies, and the innovation and sophistication factors are key for innovation-driven economies.
2. GII
   a) The GII combines innovation inputs (such as institutions, human capacity, information and communication technology and uptake of infrastructure, market and business sophistication) with innovation outputs (such as science and creative outputs).
   b) The top four countries in the GII are Iceland (with a score of 4.86), Sweden, Hong Kong and China.

The GII assesses in detail the extent to which different economies benefit from the latest innovation advances, based on three main principles (INSEAD 2010):

- There is a distinction between enablers (inputs) and outputs while measuring innovation in an economy. Enablers are aspects that help an economy to stimulate innovation and outputs are the results of innovative activities within the economy.
- There are five enabler pillars that are included in the GII, namely: institutions, human capacity, general and information and communication technology infrastructure, market sophistication and business sophistication. The enabler pillars define aspects of the "conducive environment required to stimulate innovation within an economy".
- There are two output pillars which provide evidence of the results of innovation within the economy: scientific outputs and well-being.

The scientific outputs include knowledge creation (e.g. patents, publications) and knowledge application (e.g. industry value-added; production process sophistication; employment in knowledge-intensive services). Amongst the innovation inputs or enablers, 'human capacity' is measured by investment in education and the quality of educational institutions.

In the 2009/10 GII, Kenya is ranked at 83 out of 132 countries (compared to 98 for Tanzania, and 108 for Uganda). In terms of innovation inputs, Kenya ranks at 65 (Tanzania 101 and Uganda 102). In terms of innovation outputs Kenya is ranked at 117 (Uganda 104 and Tanzania at 91). Kenya thus has the basic ingredients (innovation inputs) for innovation and participation in the knowledge economy but is incapable of translating this into appropriate innovation outputs.

Table 2.4 provides a comparison of some enabler and output pillars for Uganda, Tanzania, and Kenya. This table shows that Kenya outranks Tanzania and Uganda on every variable except 'growth rate of labour productivity'. Kenya is also a more unequal country than its neighbours as reflected in its higher Gini coefficient.

Table 2.4: Country comparison of innovation inputs (enablers) and outputs

Enabler or Output	Enabler or Output Pillar	Variable	Uganda	Tanzania	Kenya
Science Output	Knowledge creation	Local availability of specialised research and training services	3.67	3.48	4.40
		Capacity for innovation	2.56	2.53	3.35
	Knowledge application	Growth rate of labour productivity	6.00	4.90	-0.60
		Production process sophistication	2.27	2.78	3.22
Creative Output	Benefits to social welfare	GDP per capita (USD)	348	362	464
		Gini co-efficient	0.43	0.35	0.48
Human Capacity (enabler)	Investment in education	Education expenditure (% of GNI)	4.00	2.39	6.63
		Extent of staff training	3.46	3.64	4.22
	Quality of educational institutions	Quality of the educational system	3.17	3.17	4.43
		Quality of scientific research institutions	3.68	3.63	4.27
		Quality of management schools	3.54	2.83	4.44
	Innovation potential	Availability of scientists and engineers	3.71	3.48	4.31
		Enrolment in tertiary education	3.47	1.45	2.75

Source: INSEAD (2010)

2.1.2 Economic development policy and planning

Kenya Vision 2030 is the country's new development blueprint covering the period 2008-2030. It aims to transform Kenya into a newly industrialising, "middle-income country providing a high quality of life to all its citizens by the year 2030" (GRK 2007: 1).

The vision is based on three 'pillars': the economic, social and the political. The adoption of the vision comes after the successful implementation of the *Economic Strategy for Wealth and Employment Creation* which has seen the country's economy back on the path to rapid growth since 2002, when GDP grew from a low of 0.6%, rising to 6.1% in 2006 (ibid.). The aims of the three pillars are described in the document as follows (ibid.):

> *The economic pillar aims to improve the prosperity of all Kenyans through an economic development programme, covering all the regions of Kenya, aiming to achieve an average Gross Domestic Product (GDP) growth rate of 10% per annum beginning in 2012. The social pillar seeks to build a just and cohesive society with social equity in a clean and secure environment. The political pillar aims to realise a democratic political system founded on issue-based politics that respects the rule of law, and protects the rights and freedoms of every individual in Kenyan society.*

The *Kenya Vision 2030* is to be implemented in successive five-year medium-term plans, with the first plan covering the period 2008-2012.

As the country makes progress to middle-income status through these development plans, it is expected to have met its MDGs by the 2015 deadline. Some of the goals have already been met and *Vision 2030* spells out action that will be taken to achieve the rest.

The economic, social and political pillars of *Kenya Vision 2030* are anchored on macro-economic stability; continuity in governance reforms; enhanced equity and wealth creation opportunities for the poor; infrastructure; energy; science, technology and innovation (STI); land reform; human resources development; security; and public sector reforms (ibid.: 6). Key economic sectors identified include tourism, agriculture, wholesale and retail trade, manufacturing for the regional market, business process off-shoring, and financial services (ibid.: 10-15).

2.2 The Kenyan higher education system

2.2.1 Size and shape of the system

System differentiation

Kenya's higher education sector comprises seven public and 18 private universities, making it one of the largest higher education systems in Africa. There are also other higher education institutions such as polytechnics and colleges. Apart from these, the government is establishing a new public university at the coast in addition to the new constituent colleges that were allocated to the existing universities in 2007.

Private universities have, for a long time, coexisted with public universities and are continuing to flourish. The 18 private universities have different levels of status, according to their accreditation stages. These are in descending order: accredited universities (7); universities with letters of interim authority (6); and universities with certificates of registration (5) (Otieno 2010).

The rapid expansion of the higher education sector has been due to the rising demand for higher education. Private providers have taken advantage of the slow pace of expansion of the public higher education sector. Unlike the public institutions, the private universities are mainly theologically-based and offer comparatively fewer programmes. They tend to prefer business studies, information communication and technology, and the social sciences.

Table 2.5: Public and private universities in Kenya (2007)

Public universities	
Egerton University (1987)	
Jomo Kenyatta University of Agriculture and Technology (1994)	
Kenyatta University (1985)	
Maseno University (2000)	
Masinde Muliro University of Science and Technology (2007)	
Moi University (1984)	
University of Nairobi (1970)	
Private universities: Chartered (7)	
Africa Nazarene University (2002)	
Catholic University of Eastern Africa (1992)	
Daystar University (1994)	
Kenya Methodist University (2006)	
Scott Theological College (1997)	
United States International University (1999)	
University of Eastern Africa, Baraton (1991)	
Other Private Universities:	
Letters of Interim Authority (7)	Certificate of Registration (6) = All in 1999
Kabarak University (2000)	The East Africa School of Theology
Kiriri Women's University (2002)	Kenya Highlands Bible College
Aga Khan University (2002)	The Nairobi International School of Theology
Strathmore University (2002)	The Pan Africa Christian College
Great Lakes University of Kisumu (2006)	The Nairobi Evangelical Graduate School of Theology
Gretsa University (2006)	St. Paul's United Theological College
Kenya College of Accountancy (2007)	

Source: Otieno (2010)

Closely related but distinctly apart from the higher education process in Kenya are the tertiary and middle-level colleges offering various programmes. They include six diploma colleges for the training of non-graduate secondary school teachers, 20 teacher training colleges for primary school teachers, four national polytechnics, 17 institutes of technology and 20 technical training institutes (ibid.). There are also a number of private post-secondary education and training institutions whose precise numbers are not known. Non-graduate healthcare professionals (e.g. nurses and clinical officers) are trained in 11 medical training colleges in various parts of the country.

Participation in higher education

The government of Kenya has endeavoured to increase participation in higher education since independence. Even when there was only one federal university of East Africa, enrolment of Kenyan students in overseas universities was pursued to ensure widened access to higher education.

University enrolments

Students who qualify for post-secondary schooling either enrol in the regular programmes in the public universities, self-sponsored programmes in the public universities, private universities, middle-level colleges including the national polytechnics, teacher training colleges (both certificate and diploma), or proceed for university education overseas. The minimum qualification needed for university admission is a C+ pass. Despite more than 50 000 students qualifying for admission each year, not more than 10 000 get admission into the regular programme. As a result, a number of students qualify but are not admitted (Table 2.6).

Table 2.6: Admission trends to public universities (2002/03-2005/06)

Academic year	Total form 4 enrolment	No. qualified (c+ and above)	JAB admissions	% qualified admitted	% of form 4 admitted
2002/03	176 018	42 158	11 046	26.2	6.3%
2003/04	186 939	42 721	10 791	25.3	5.8%
2004/05	193 087	58 218	10 200	17.5	5.3%
2005/06	209 276	68 030	10 000	14.7	4.8%

Source: Otieno (2010)

Despite the limited direct intake, the population of university students has continued to grow. Public universities dominate in enrolments, even though there are more private institutions. By 2004/2005, the six public universities had 91 541 students, while all the private universities (18) had 10 050 students (Otieno 2010).

The total enrolment of self-sponsored students (Module II) at University of Nairobi in 2004/2005 was more than the regular full-time students and also higher than enrolment in all private universities. Enrolments in the self-sponsored programmes are actually higher since many students are integrated (attend the same classes as regular students, as opposed to mainly evening and school-based study) in full-time study. What this confirms is that public universities have been able to expand their internal capacity much faster than the private universities. The part-time, private programmes are responsible for this increase, since there has been stagnation in the number of regular students being enrolled in public universities.

Private university share of total enrolments is currently only 11%, down from a high of 20% before the onset of privatisation (i.e. self-sponsored students) in public universities. The rapid growth of the public sector universities, especially through these Module II programmes, largely explains the reduced private university share. Public sector enrolments in 2004/2005 reflect a growth of 80.5% (or 16.1% annual) over 2000/2001. In contrast, the private university growth was 18.4% (3.7% annual) over the same period (ibid.). This growth pattern reflects the changing fortunes of public and private institutions. The privatisation gains by the former create hurdles for the latter.

Two other aspects of public and private provision stand out. First, though public universities remain public, more than half of the enrolments are in private entry schemes in these universities. Second, there are more female students in the private than public universities. In the former, they constitute about 52% of enrolments whereas in the latter, they are only about 30% of the total student population (ibid.).

Technical education enrolments
Technical education, popularly known as TIVET (technical, industrial, vocational and entrepreneurship education and training), is offered in four national polytechnics (Kenya, Mombasa, Eldoret and Kisumu), 17 institutes of technology, 20 technical training institutes and the Kenya Technical Teacher Training College (ibid.). In addition to these, a number of government ministries also offer three-year professional training at diploma level for their middle-level human resource requirements. There are also several other private commercial technical institutions whose exact number is not known.

Enrolment in TIVET institutions fluctuated between 2002/03 and 2006/2007. It grew from 52 254 to 66 737 students between 2002/03 and 2003/04, only to decrease to 29 870 in 2005/06 (ibid.). The decrease may be attributed to: a) abolition of production courses in these institutions; b) unaffordability due the high cost of technical education (estimated at KES 110 000 per year) compared with the high poverty levels; c) lack of scholarships or any form of government support for those not able to pay; and d) diversification of courses offered in the institutions and relevance of the same to the labour market (ibid.).

The polytechnics account for a total of 37% of technical education enrolments.

Enrolments in teacher education
There are 28 primary teachers training colleges in the country, of which 20 are public. There are also three diploma teacher training colleges. Enrolment in these colleges was just under 18 000 in 2006, with females making 50.5% of enrolment (ibid.). Teacher training colleges form an important avenue for those who desire to continue with post-secondary education but fail to secure admission in the universities and other technical education institutions. Notably, however, enrolment in these institutions has not risen as steadily as in other higher education institutions.

2.2.2   Higher education expenditure and financing[3]

Since their inception, the funding of public universities in Kenya has been mainly in the purview of the government. However, due to the very rapid expansion of the sector, the government has encouraged the public universities to establish alternative strategies for generating additional funding. The privately-sponsored student programmes and the establishment of university

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[3] This section draws on Otieno (2010).

companies to commercialise some non-core aspects of the universities are some strongly emerging examples.

Funding is one of the major challenges facing Kenyan universities. In recent years, government funding for higher education has increased only marginally. Higher education, as a proportion of GDP, averaged 0.88% between 2002 and 2007 while, as a proportion of total education spending, it has averaged 13.7%. State funding for universities is based on an 'assumed unit cost' of KES 120 000 (about USD 1 500) per student. Of this amount, the state provides KES 70 000 (about USD 900), while the rest has to be provided by the student – either through the publicly-funded loan and bursary scheme or from other private sources.

State funding constitutes the bulk of university income, representing between 50 and 90% of total institutional revenue. Income from parallel, fee-paying programmes constitutes an average 15% of revenue. The UoN has the highest proportion of income derived from fees, some 40%.

There is a variety of student finance schemes, ranging from full government sponsorships, a government-funded loan and grant scheme administered by the Higher Education Loans Board, and private scholarships of various types.

Types of institutions by funding structures

The university sub-sector in Kenya can be categorised into three distinct finance structures: publicly-financed, privately-financed, and a mix of public-private finance. The financing structure is closely tied to institutional type and ownership. However, there is a systematic move by public institutions to tap private funds, while private institutions also endeavour to access public funds. In general, public institutions have more latitude in accessing private funds than do private institutions in appropriating public funds. Purely public funding for higher education is exemplified by the yearly government allocations to public universities. Traditionally, public universities have received generous funding from the government; these funds have constituted the major sources of income for these institutions.

Education takes the bulk of the resources provided for the social sector (education, health, home affairs), accounting for up to 73% of the total social sector budget. As a proportion of total government budget, it is still significant at about 27% and 6.4% of GDP.

The education budget has been steadily rising between 2002/03 and 2006/07. It rose by 14% from KES 63 billion in the 2002/03 financial year to KES 72 billion in 2003/04. Between 2003/04 and 2004/05, the recurrent expenditure allocations rose from KES 72 billion to KES 80 billion representing an 11% increase. Allocations have continued to rise to peak at KES 99.8 billion by 2006/07. In 2002/03, education took up 29.6% of the total budget but this had fallen to 23.7% by 2006/07.

Recurrent expenditure allocations have been rising steadily, increasing from KES 61 billion during 2002/03 KES 68 billion in 2003/04 and KES 86 billion in 2005/06. Recurrent expenditures are substantially high in all the five-year allocations comprising over 80% of the total Ministry of Education budget. On the other hand, development expenditure allocations have remained below the KES 10 billion mark.

Higher education spending

Funding for higher education increased marginally between 2002/03 and 2006/07. In 2002/03, higher education expenditure took up 11.5% of the total Ministry of Education expenditure, rising to 13.8% in 2003/04 and 16.4% in 2005/06. This significant rise in higher education expenditure is attributed to the increase in lecturer salaries and housing allowances. The 2006/07 financial year saw a substantial decline in higher education allocations in both volume and proportion. This was the result of a deliberate shift in policy to place greater focus on lower levels of education, and on new items such as quality assurance across the system.

Higher education spending as a proportion of GDP for the five years has averaged 0.9% while as a proportion of total education spending it has averaged 13.7%. The highest allocation occurred in 2004/05 when the respective proportions were 1.06% and 16.1%, while the lowest was 2002/03 (11.7%), increasing gradually to peak at 16.1% during 2005/06 before declining to 14.4% during 2006/07.

State funding constitutes the bulk of universities' income, representing anything between 50 to 90% of total institutional revenues. While the total revenues of smaller public universities are made up almost entirely of grant allocations from government, for bigger public universities (with higher student numbers) capitation grants constitute lower proportions of their total revenue. This observation, arises in part from the fact that while the bigger public universities (like UoN and Kenyatta University) have capacities to accommodate more self-sponsored students, the smaller institutions (e.g. Maseno and Masinde Muliro University of Science and Technology) have space, locational and structural constraints to attracting significant numbers of self-sponsored students to raise substantial private revenues. Other factors that diminish the grant capitation as a proportion of total revenue include donor funding to the institutions. Income from Module II (self-sponsored) programmes constitutes an average of 15%, although the actual proportions vary significantly between institutions. As stated earlier, the UoN has the highest proportion of its income being derived from the Module II programmes at an average of 40%, while Masinde Muliro University of Science and Technology has the lowest at 7.7%.

Financing private universities

There has been a phenomenal growth in the number of private universities, from just three in 1980 to 18 in 2007. This contrasts with only seven public

universities for over 40 years. While public universities get direct funding from the state, private universities depend on endowments, tuition fees and direct funding from founders and sponsors. While public universities are highly subsidised by the state, private universities have to recover most of their costs from instruction and other services such as hostel accommodation. As expected, this has made these universities notably expensive compared to the public institutions. The only form of public funding for these universities comes in the form of student loans. However, this is notably small compared to the amounts received by public universities. Lack of public funding for private universities partly stems from the legal definition of public and private universities. According to the law, a 'private university' means a university established with funds other than public funds, while a 'public university' means a university maintained or assisted out of public funds.

Private university students pay tuition that is on average 11 times higher than that of students in governmentally-supported programmes in public universities. The high fee levels are not due to any special courses offered, but due to the profit motive of these institutions, including the religious institutions, and also the fact that the public university education is heavily subsidised by the state.

An important question is whether the high fees in private universities are inhibiting access and equity. Moreover, access to higher education is already inequitable because the rich have a higher representation in secondary level education. In Kenya, the introduction of the Module II programmes in public universities has effectively introduced an element of cross-subsidisation with the income from these programmes being used to improve facilities that are shared by both the regular and Module II programmes. The private institutions therefore charge fees that not only reflect the actual cost of offering university education but they are also meant to generate surplus funds.

While the public university sector seems unable to enrol more students because of limited capacity (an argument which, however, does not hold considering that the institutions limit admission in the regular programme but 'open' the self-sponsored programmes, raising the question of where the 'extra' capacity comes from), private universities are closed to many who aspire to higher education because of the inability to pay. This means that the capacity in private universities is underutilised, much as maintaining low enrolment is in line with increasing teacher-student interaction, one of the methods presumed to 'assure' quality. It is also true that a majority of private universities are driven by a profit motive, meaning that they have to strike a balance between maintaining a realistic number of students while attracting more funds through increasing enrolment. The extent to which the universities have succeeded in doing this has not been investigated so far and remains largely unknown.

2.2.3 Higher education governance and policy

The Ministry of Education is the main agent in policy formulation, implementation, evaluation and regulation of the system. The Commission on

Higher Education (CHE) was established in 1985, under an Act of Parliament, to be responsible for the planning, budgeting and financing of universities; accreditation and supervision; the coordination of post-secondary education and training; the recognition of qualifications from other countries; and the documentation of information on higher education.

CHE regulates the establishment of universities based on benchmarks on admission requirements, programme length, qualification levels, qualifications of staff, enrolments, infrastructural facilities, and ethical standards governing university members. CHE is also the state body that presides over matters of quality assurance in private universities, awards letters of interim authority to new private universities and their eventual confirmation as chartered institutions. Although CHE's administrative mandate is functionally restricted to the regulation of private universities, statutorily the commission should regulate the entire higher education system including public universities.

The key policy documents relating to education, science and technology during the past decade have been the following:

- The Kenya Education Sector Support Programme (KESSP) 2005-2010 (MEST 2005),
- The Ministry of Higher Education, Science and Technology Strategic Plan 2008-2012 (MHEST 2008), and
- The Science, Technology and Innovation Bill (MHEST 2009).

The Kenya Education Sector Support Programme (KESSP) (2005-2010)

The Ministry of Education, Science and Technology (MEST) adopted a Sector-Wide Approach (SWAp) to ensure the delivery of educational services to the learner in the most effective and efficient manner. Since June 2004, the MEST has been working with a wide range of stakeholders in the education sector to develop a SWAp for the development of the education sector in Kenya for the 2005-2010 period (MEST 2005: i).

The overall aim of the education sector SWAp was to develop and secure funding for the KESSP, which would be the basis upon which the government, MEST, individuals, communities, the private sector, non-governmental organisations (NGOs) and development partners would jointly support the education sector for the period. Through SWAp, duplication and inefficient use of resources, which often occurs when many projects and programmes are implemented without a clear long-term sector-wide development strategy, would be significantly reduced. This was expected to ensure that the resources would be invested in programmes that would deliver an equitable quality education and training to all Kenyans (ibid.).

KESSP was developed to help the government to achieve the following targets as outlined in the Sessional Paper of 2005 (ibid.: iii-iv):

- Attain universal primary education by 2005 and education for all by 2015;

- Achieve a transition rate of 70% from primary to secondary school level from the current rate of 47%, paying special attention to girls' education by 2008;
- Enhance access, equity and quality in primary and secondary education through capacity building for 45 000 education managers by 2005;
- Construct/renovate physical facilities/equipment in public learning institutions in disadvantaged areas, particularly in arid and semi-arid lands and urban slums by 2008;
- Develop a national training strategy for TIVET in 2005, and ensure that these institutions are appropriately funded and equipped by 2008;
- Achieve 50% improvement in levels of adult literacy by 2010; and
- Expand public universities to have a capacity of at least 5 000 students each by 2015 and increase the proportion of all students studying science-related courses to 50%, with at least one third of these being women by the year 2010.

The MHEST Strategic Plan (2008-2012)

According to the strategic plan, with regard to the development of a national innovation system, the Ministry's efforts will be directed at the following (MHEST 2008: 3):

- Ensuring that Kenya has a set of institutions, organisations and policies which give effect to the various functions of a national system of innovation;
- Building capacities and capabilities of the institutions, organisations and performance systems for an efficient system of innovation;
- Ensuring that there are interactions among and within all sectors and actors in the economy; and
- Harmonising the national system of innovation with the goals and objectives of *Vision 2030*.

Key elements of the proposed innovation system include the following (ibid.: 4-7):

- The correlation of demand for STI to the structure of the economy. As the Kenyan economy moves into an era of high growth, it is recognised that there will be need for new and better human resource skills and technologies focused on making business and production process more efficient and effective.
- Education and research are recognised as important determinants of the ability to create a knowledge-based economy.
- The business system (private sector, key economic sectors) is critical to the process of acquiring and utilising STI for national development.
- Intermediate organisations (e.g. universities, research institutions) are developers and transmitters of knowledge between business systems, on the one hand, and the education, training and research system, on the other.
- Infrastructure is a key foundation upon which STI activities are operationalised.
- Framework conditions relating to regulatory and facilitative policies followed in shaping the performance of the national innovation system are critical.

MHEST would therefore adopt a new innovation system to ensure that the education and research system, the business system, the intermediate organisations, as well as the STI infrastructure and framework conditions in which they operate interact dynamically and respond to the national needs.

The MHEST strategic plan outlines the following strategic objectives (ibid.: 25-26):

- To strengthen technical capabilities and capabilities
- To develop high skilled human resources
- To intensify innovation in priority sectors
- To improve STI awareness
- To increase access and equity in higher education and in TIVET
- To improve the quality of higher education and TIVET
- To strengthen the corporate governance management framework

The Science, Technology and Innovation Bill (2009)

The Science, Technology and Innovation Bill establishes institutions and policy guidelines that provide for the following (MHEST 2009: ii):

- The promotion of research, science, technology and innovation for national socio-economic development;
- Generation of advice, harmonisation, coordination and dissemination of policies for research, science, technology and innovation;
- The promotion and coordination of technology acquisition, adaptation and diffusion into national development processes; and the development of mechanisms for the promotion and utilisation of innovations in the country; and
- Mobilisation, management and disbursement of funds for science, technology and innovation.

The institutions that are to be created through the Bill include the following (ibid.: iii):

- The Kenya National Acquisition Office for the promotion and coordination of technology acquisition, adaptation and diffusion;
- The National Innovation Agency for stimulating and intensifying technological innovation and invention in order to improve economic growth and the quality of life for all Kenyans;
- The National Commission for Science, Technology and Innovation whose mandate is to provide for the generation of advice, harmonisation, coordination and dissemination of policies for research, science, and technology; the promotion of research, science, technology and innovation for national socio-economic development.
- The Kenya National Research Foundation whose key functions are the mobilisation, management and disbursement of funds for science, technology and innovation activities including funds for human resource development and

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the provision of the necessary research facilities in order to facilitate the creation of knowledge, innovation and development in all fields of science and technology, including indigenous knowledge and thereby to contribute to the improvement of the quality of life of all Kenyans.

2.3   The University of Nairobi

2.3.1   Key moments in the development of the institution[4]

The origins of the University of Nairobi trace back to 1947, when the colonial government of the time drew up a plan seeking to establish a technical and commercial institute in Nairobi. In 1949, the plan grew to include an East African concept aimed at providing higher technical education for the three territories (Kenya, Uganda and Tanzania) of East Africa. It was in 1951 that this concept received a Royal Charter, under the name of the Royal Technical College of East Africa.

The Royal Technical College of East Africa finally opened its doors to the first intake of students (A-level graduates for technical courses) in April 1956. A working party established in July 1958 recommended, among other things, that through a process of reconstruction and addition of appropriate facilities, the College be transformed into the second Inter-Territorial University College in East Africa. The East African governments accepted the recommendation and on 25 June 1961, the Royal Technical College was transformed into the second university college of East Africa, under the name Royal College Nairobi.

During this time, the University College prepared students in the faculties of Arts, Science and Engineering for the BA and BSc general degrees of the University of London. Students in the Faculty of Arts and Architecture and the Faculty of Special Professional Studies (later renamed the Faculty of Commerce) continued to work either for a college diploma or for the qualifications of professional bodies such as the Royal Institute of Chartered Institute of Secretaries. At the same time, the Department of Domestic Science had entered into a Special Relation Scheme with the University of Manchester in 1959. In 1962, the Faculty of Veterinary Science was transferred from Makerere University College to the Royal College Nairobi. In 1963, the Extra-Mural Studies, which had hitherto been organised in Kenya by Makerere, was also transferred to the Royal College Nairobi. At the same time, the College of Social Studies (Kikuyu), which had been an independent centre for residential adult education since 1961, was absorbed into the college. This made it possible for the creation of the Institute of Adult Studies in 1963, comprising the two departments.

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[4] The information in this section was provided by Mr Samuel Kiiru as part of the background information of the institution (Kiiru 2009).

With such positive developments, the Royal College Nairobi was renamed University College of Nairobi on 20 May 1964. In 1966, the Institute of Adult Studies was renamed Adult Studies Centre and in 1967 it got a third department in the form of a Radio/Correspondence Course Unit. In 1965, the Institute for Development Studies was established with two divisions: social science and cultural studies. While the social science division undertook research for various government ministries and pursued fundamental research in East African, particularly Kenyan, economic problems, the cultural studies division carried out research into the Kenyan cultural heritage. The cultural division was separated from the institute and set up as a distinct unit during the 1970/71 academic year. It later became the Institute for African Studies and started offering a degree course in Anthropology in 1989.

In 1967, the Faculty of Medicine was established and admitted its first batch of students. Based at Chiromo, for its pre-clinical teaching, the faculty's clinical work is carried out in Kenyatta National Hospital, at the College of Health Sciences, itself created in 1985. Following the Faculty of Medicine in 1967, the Faculties of Agriculture in upper Kabete and Law in the main campus were established in July 1970. In the same year, a Faculty of Education was created out of the previous Department of Education. The faculty was later transferred to Kenyatta University College (a constituent college by then) in September 1972.

In April 1970, the School of Journalism was inaugurated. The school started off offering a two-year programme in journalism. The work on the school had started in 1963 and was created with assistance from the International Press Institute, the Ministry of Education and UNESCO. In the same year, the Department of Philosophy and Religious Studies was established in the Faculty of Arts, and other departments were established from larger departments, including Fine Art and Design, Medical Physiology and Medical Biochemistry, and Veterinary Physiology and Veterinary Biochemistry.

All this time, except for students in the Department of Domestic Science and Land Development, whose qualifications were obtained from the University of Manchester or professional bodies, students continued to work for the degrees of the University of London. The University of East Africa was dissolved on 1 July 1970 and the three countries set up their own national universities out of the three technical colleges of the University of East Africa. Consequently, the UoN was officially inaugurated on 10 December 1970. This was followed by the establishment of additional departments such as biochemistry in the Faculty of Science; and pharmacology and toxicology in the Faculty of Veterinary Medicine. Working closely with the East African Community, the university established a meteorological research institute. The institute comprised two departments: one at the UoN and the other at the East African Meteorological Department in Dagoreti, Nairobi.

The departments of Pharmacy and Dentistry were established in 1974 and elevated to faculty status in 1996 within the College of Health Sciences. In 1974, the Department of Biochemistry was set up as a service department for all

science-oriented faculties. For administrative purposes, the department was housed at the Faculty of Medicine.

The university has since then witnessed further growth and, in 1983, underwent a major restructuring resulting in decentralisation of the administration. Today, the UoN has the following six campus colleges, each of which is headed by a principal:

- College of Agriculture and Veterinary Sciences situated at Upper Kabete Campus
- College of Architecture and Engineering situated at the Main Campus
- College of Biological and Physical Sciences situated at Chiromo Campus
- College of Education and External Studies situated at Kikuyu Campus
- College of Health Sciences situated at the Kenyatta National Hospital
- College of Humanities and Social Sciences situated at the Main Campus

It also has twenty faculties including agriculture, arts, veterinary medicine, law, medicine, biological sciences, business, computing and informatics, continuing and distance education, dental sciences, economics, education, engineering, journalism, mathematics, nursing sciences, pharmacy, arts and design, and built environment. In addition to the Kenya Science Campus and the Board of Postgraduate Studies, there are a number of centres and institutes: Centre for Biotechnology and Bioinformatics; Centre for Open and Distance Learning; Centre for HIV Prevention and Research; Centre for International Programmes and Links; Institute for Development Studies; Institute of Anthropology, Gender and African Studies; Institute of Nuclear Science and Technology; Institute of Diplomacy and International Studies; Institute of Tropical and Infectious Diseases (Kenya Science Campus); and the Population Studies and Research Institute.

In summary, since 1970, the UoN has seen many innovations which have contributed to its development and that of the nation. It has grown from a faculty-based university serving a student population of 2 768 (2 584 undergraduate and 184 graduate students), to a college-focused university serving around 39 000 students in the 2008/09 academic year, and with over 75 departments and over 4 200 courses, offered to both undergraduate and graduate students. To attain this level of educational progress has been no small feat. Some of the major milestones covered in the expansion of the university include:

- Mushrooming of academic programmes in the 1970s;
- Establishment of campus-based colleges in 1985;
- First double intake in 1986;
- Property acquisition resulting in Lower Kabete and Parklands Campuses in 1988;
- The intake of the first students undertaking the university component of the 8-4-4 educational system in 1990; and
- Introduction of the Module II and part-time programmes in 1998.

The university's development has been as broad as its current scope is wide. From a humble beginning as a technical college to the status of a major international teaching and research institution, the UoN has trained and produced more human resources than any other institution of higher learning in Kenya, with alumni of over 40 000 graduates to its credit. As an institution of higher learning, the UoN has contributed greatly to the development of Kenya. Apart from teaching, the university contributes to research and consultancy services in various fields in the country and the region. In addition, the university takes part in community programmes and activities as part of its core functions.

2.3.2   Governance and strategic objectives

The university is led by a vice-chancellor, three deputy vice-chancellors (for Administration and Finance, for Academic Affairs, and for Student Affairs) and an Academic Registrar, as well as the principals of constituent colleges, deans of faculties and directors of centres. Key governance bodies include the University Council, the University Senate and the University Management Board. The latter is responsible for:

- The coordination of university and college development plans;
- The efficient management of university resources, both human and material; and
- Making proposals to the Council and the Senate on policies that have a university-wide application.

The university's vision is to be "A world-class university committed to scholarly excellence". Its mission is "To provide quality university education and training and to embody the aspirations of the Kenyan people and the global community through creation, preservation, integration, transmission and utilisation of knowledge".

The current strategic plan (UoN 2008a), which covers the period 2008-2013, includes the following strategic issues and objectives:

Teaching and learning:

- Objective 1: To offer innovative academic programmes with in-built quality assurance.
- Objective 2: To nurture academic programmes to world class status.
- Objective 3: To actively promote diversified modes of delivery.

Innovation, research and development, and consultancy:

- Objective 4: To create an enabling environment and policy framework that promotes research, development and other value adding services.

Governance, leadership and management:

- Objective 5: To develop a governance system that effectively serves the university.
- Objective 6: To realise a visionary, innovative leadership and management that is visible, open and transparent.

Human resources:

- Objective 7: To attract, develop and maintain high calibre, qualified staff.
- Objective 8: To strengthen and sustain implementation of gender, marginalisation, HIV/Aids and disability policies.

Infrastructure, information and communication technology, and library services:

- Objective 9: To provide and maintain adequate state of the art infrastructure that supports the core functions of the university.
- Objective 10: To maximise student and staff productivity and service delivery, enhance teaching and learning and improve quality of research through information and communication technology.

Partnerships and linkages:

- Objective 11: To strengthen the existing partnerships and linkages and develop new ones.

Finance:

- Objective 12: To realise increased revenue and fiscal health.

Student affairs:

- Objective 13: To produce holistic graduates.

Image:

- Objective 14: To promote a university brand which embodies the concerns and aspirations of the stakeholders and universal values.

2.3.3 Institutional finances

Table 2.7 shows that the government allocation to the UoN almost doubled from USD 25 206 715 in 1999/2000 to USD 48 363 393 in 2006/2007.

Table 2.7: University of Nairobi government allocation (1999/00-2006/07)

Year	Government allocations (KES)	Government income in USD	Conversion rate
1999/00	1 480 440 764	25 206 715	58.7 KES = 1 USD
2000/01	2 047 503 589	33 917 597	60.4 KES = 1 USD
2001/02	1 634 322 024	23 239 229	70.3 KES = 1 USD
2002/03	1 899 017 714	24 929 344	76.2 KES = 1 USD
2003/04	1 970 459 432	25 081 265	78.6 KES = 1 USD
2004/05	2 675 862 503	34 045 352	78.6 KES = 1 USD
2005/06	2 675 862 492	36 406 292	73.5 KES = 1 USD
2006/07	3 303 655 000	48 363 393	68.3 KES = 1 USD

As can be seen from Figure 2.1 below, the proportion of income from state allocations has declined from 76% in 1999/2000 to 55% in 2005/2006. At the same time, there has been a considerable increase in the proportion of income from income-generating units to almost a third (29%) in 2005/2006. It is quite likely that this is funding generated through the module 2 (private, fee-paying) academic programmes as well as other income generation such as consultancy work. A few institutional leaders made reference to the development of an internal fund, based on the income derived from module 2 courses, which is used to fund research and priority skills courses, amongst other things. Another key source of additional income for the university is the University of Nairobi Enterprises and Services (UNES) Ltd. Established in 1996, UNES is mandated with promoting and coordinating income-generating activities for the university. Currently, it generates income through consultancy work, and the management of bookshops and restaurants and has plans to extend its operations to the management of conference facilities.

Figure 2.1: Income by source as a percentage of total income, University of Nairobi (2000 - 2006)
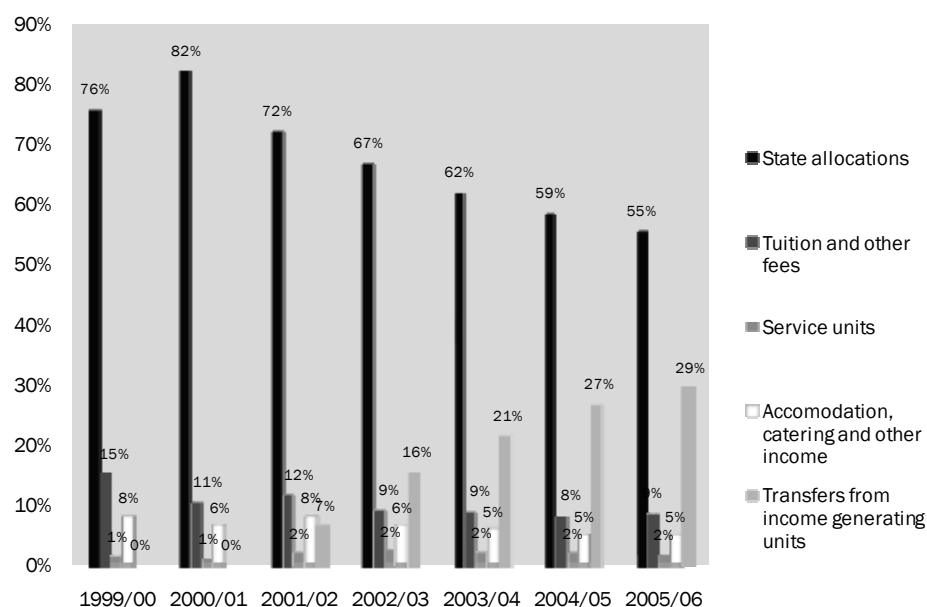
Part 3

The role of higher education in Kenya

AT A GLANCE

- Key national higher education stakeholders
- Role of higher education in national policies
- Policy coordination in the higher education sector
- Institutional narratives on the role of the university
- Policies, structures and appointments
- Research funding
- Research agenda
- Linkages with the labour market

3.1 Introduction

As was highlighted in section 1.1.3, the existence of a 'pact' between national and institutional stakeholders, as well as external stakeholders such as industry and foreign donors, on the role of higher education is a key factor in the extent to which universities are able to make a sustained contribution to development. A pact was defined as a fairly long-term cultural, socio-economic and political understanding and commitment between universities, political authorities and society at large of the identity or vision of universities, what is expected of universities, and what the rules and values of the universities are. For the purposes of this study, our interest is in exploring the general nature of the pact, and then the extent to which there is a role for higher education in economic development in the pact.

We begin our analysis of the nature and extent of a pact in Kenya by considering the notions(s) of the role of higher education from the perspective of the national authorities and the institutional stakeholders at the UoN. This includes an investigation of the ways in which both national and institutional stakeholders talk about development and the role of higher education, whether and how these notions are articulated in relevant policy documents, and the extent to which specific structures have been established to give expression to the intent of the policies. It also includes a look at the extent to which matters pertaining to higher education are coordinated across national authorities, and between national authorities, higher education institutions (with a specific focus on UoN) and key external stakeholders.

3.2 The national perspective

3.2.1 Key national stakeholders in relation to the pact

The key stakeholders in relation to the pact for higher education and development are the following:

- Office of the President, responsible for 'cross-cutting' policy development;
- Ministry of Education – responsible, amongst other things, for improving schooling in both its quantitative and qualitative dimensions;
- Ministry of Higher Education, Science and Technology responsible for policy development in both higher education and science and technology, and the key driver of innovation and participation in the knowledge economy; and
- The Commission on Higher Education, responsible for quality assurance across the higher education system, amongst other things, but clearly operating well below its potential at the current time.

3.2.2 The role of higher education in national policies

Kenya Vision 2030 is the key policy document outlining the role of higher education in development. Some key features of *Vision 2030,* with particular relevance to higher education and economic development, are described below.

Firstly, *Vision 2030* proposes intensified application of STI to raise productivity and efficiency levels across the three pillars (economic, social and political) (GRK 2007: 8-9). It recognises the critical role played by research and development (R&D) in accelerating economic development in all the newly-industrialising countries of the world. According to the vision, the government will create and implement an STI policy framework to support *Vision 2030*. In addition, more resources will be devoted to scientific research, technical capabilities of the workforce and in raising the quality of teaching mathematics, science and technology in schools, polytechnics and universities.

Secondly, in terms of human resources development, the *Vision 2030* document states that Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrialising economy (ibid.: 9). This will be done through lifelong training and education. As a priority, a human resource database will be established to facilitate better planning of human resources requirements in the country. Furthermore, steps will be taken to raise labour productivity to international levels. Other steps will include the establishment of new technical training institutions, as well as the enhancement of closer collaboration between industry and training institutions.

Finally, in relation to education and training, *Vision 2030* states that Kenya will provide globally competitive quality education, training and research to her citizens for development and enhanced well-being (ibid.: 16). The overall goal

for 2012 is to reduce illiteracy by increasing access to education, improving the transition rate from primary to secondary schools, and raising the quality and relevance of education. The goals in this regard include the integration of all special needs education into learning and training institutions, achieving an 80% adult literacy rate, increasing the school enrolment rate to 95%; and increasing the transition rates to technical institutions and universities from 3% to 8% by 2012. Public and private universities will be encouraged to expand enrolment, with an emphasis on science and technology courses. Kenya also intends to have international ranking for its children's achievement in maths, science and technology.

The specific strategies will involve integrating early childhood education into primary education; reforming secondary curricula; modernising teacher training; and, strengthening partnerships with the private sector (ibid.).

Kenya will also develop key programmes for learners with special needs, rejuvenate ongoing adult training programmes, and revise the curricula of university and technical institutes by including more science and technology subjects. In partnership with the private sector, the government will increase funding to enable all these institutions to support activities envisaged under the economic pillars. Kenya aims to be a regional centre of research and development in new technologies.

The 'flagship' education and training projects for 2012 include the following (ibid.):

- To build and fully equip 560 new secondary schools to accommodate the increasing number of students graduating from primary schools;
- To establish a teachers' recruitment programme to employ 28 000 more teachers to improve the quality of education and to ensure that all schools have adequate teachers;
- To establish a computer supply programme that will equip students with modern information technology skills;
- To build at least one boarding primary school in each constituency in the pastoral districts to ensure that learning is not disrupted as people move from one place to another;
- To roll out the voucher system programme in five poor districts; and
- To create 'Centres of Specialisation' for each of *Vision 2030's* economic growth sectors.

In summary, the policy framework for ensuring that higher education can play an important role in development is in place. In addition, there is a clear recognition of the importance of science and technology for stimulating innovation and participation in the knowledge economy. However, key indicators relating to such measures as competitiveness and innovation suggest that the country has a long way to go to ensuring that the noble policy intentions of government are translated into effective implementation and outcomes.

3.2.3   Governance and policy coordination

In the higher education sector, it is evident that the creation of a Ministry of Higher Education, Science and Technology represents a positive development for both governance and policy coordination across the two critical elements vital for the development of a knowledge economy, namely higher education and science and technology. However, the policy coordination links across development (economic development policy-making specifically) and higher education are, at best, weak and, at this stage, only exemplified in policy documents such as *Kenya Vision 2030*.

3.3   The University of Nairobi perspective

3.3.1   Institutional narrative(s) on the role of the university

The previous university strategic plan (2005-2010), which refers to teaching and learning as the core business of the university, makes reference to the important role for the university in producing human resources for national development (UoN 2005: 40):

> *A University plays a pivotal role in national development by equipping human resource with relevant knowledge, skills and value systems. The University of Nairobi is endowed in terms of human capital and diversified academic programmes and must therefore play a leading role in generation and dissemination of relevant knowledge in order to meet developmental challenges of the 21st Century and beyond.*

An institutional leader pointed to the historical role of the university in producing human capital for development, and how the university has subsequently responded to new development challenges through the review and updating of curricula. He said that today it is possible to see UoN alumni making direct contributions to development in various sectors:

> *I think really right from the beginning, this being the first national university, the focus had been to play a leading role in providing the necessary human capital for driving this nation. And you will see then from the '60s the government gave such a mandate to this university to train the critical manpower; not only to take over the positions that the foreigners were leaving, going back, but also to drive development. So from economists to medics, that was the main mandate for this university. [...] I will say of course times have changed and the challenges of development have become even more critical, and that's where now you start seeing really our review of curriculums and the*

various areas of training to accommodate these new changes, to accommodate new thinking. In terms of contribution you will realise that at current rate we have graduated over 100 000, it will be 110 000 alumni of the University of Nairobi in all key sectors; they're actually occupying virtually all key sectors of the economy. [...] If you look at the critical role of government in terms of planning, we've got University of Nairobi alumni contributing in these key sectors – health, economy and so on. (Institutional leader)

This emphasis on the role of the university in producing important skills for the economy was echoed by another institutional leader. He also hinted at how the World Bank policy of focusing on primary rather than tertiary education in Africa led to a decline in support by the government for higher education in Kenya:

I really want to emphasise that I do believe that higher education is very important for development, whether you are talking about economic development or social development or political development, I believe higher education has a big role to play. One thing is that if you look at what has been happening in this country there is a time when there was a shift in emphasis, especially when I think with the advice of the World Bank and [International Monetary Fund], when they tried to say it's better to put more resources in basic education and followed by secondary education. And in fact they almost de-emphasised putting resources in higher education. [...] I have always been saying very openly that there is no way really you can say that development can be supported by people who have basic education, say, primary and secondary education. Because if you look at the kind of manpower that we need in both the public and private sector, a university education, particularly undergraduate education, is almost compulsory. I don't think you can really argue otherwise. I have seen some ministers now saying that even if you don't have a degree you can still do very well. But that is at the higher level. But the technical jobs, really, you know, people like accountants, lawyers, doctors – we need university education. (Institutional leader)

The current strategic plan (UoN 2008a: 2) also refers to teaching and learning as the "core business" of the university. Innovation, research and development are described as "key strategic issues that the University must address in order to remain relevant in its pursuit to extend the frontiers of knowledge" (ibid.: 3). Interestingly, consultancy is seen as the area of the university's activities that has "great potential ... to contribute towards national development" (ibid.).

There is no mention of the knowledge economy in the current strategic plan. It is, however, mentioned in various contexts in the previous strategic plan (2005-2010). For instance, in the discussion of the opportunities available to the university, the plan makes reference to "a strong worldwide move towards knowledge based economies [and] demand for knowledge driven consultancies" (UoN 2005: 7). Reference is made again later in relation to changes in the economy where the emphasis is on the demands the knowledge economy creates in terms of teaching and learning (ibid.: 18-19):

> *The increasing sophistication of the economy itself is demanding more skilled personnel to meet the needs of a more enlightened market. The global trend is that knowledge-based and value adding economic activities are increasingly becoming the stimuli of economic growth. Consequently, national economies are relying on higher knowledge in order to retain and expand their economic niches and competitiveness at the national and global arenas. These technological advances now require an ever adaptive, more strategically agile and sophisticated work force. Employers are demanding that workers should possess increased technical expertise and enhanced abilities to learn new skills as new technologies emerge.*

There is also reference to the role of postgraduate training and institutional research activities in relation to the development of a knowledge economy (ibid.: 42):

> *Research is the principal activity, which distinguishes a University from other tertiary institutions. It is an integral part of teaching at undergraduate and postgraduate levels. Through research, new knowledge is generated, refined and utilised for socio-economic betterment of the society. It plays a vital role in rural and industrial transformation, economic growth and creation of employment opportunities.*
>
> *University of Nairobi has diverse capacities and graduate training programmes which should be refocused to address national developmental challenges and the Millennium Development Goals for improved livelihoods. To achieve this, the University will embark on a dedicated effort to build capacity with a strong orientation towards problem solving research. This approach will strengthen the capacity of the University for building endogenous innovation systems to generate and sustain scientific and technological development in all sectors in the knowledge-based global economy. Thus the*

University's capacity in the discovery and development of knowledge will be raised.

One institutional stakeholder argued that what exactly the role of the university is or should be is currently not clear:

All African universities went through phase one, a separation from the metropolitan institution, the University of Nairobi from the University of London, and Makerere from the University of London – that international phase; and that was consolidated by the late 1960s. At the same time there was a simultaneous phase of universities for manpower development; they were part of the Africanisation programme. Then the alienation phase when dictatorship set in. Then a renewal that we're now seeing. But under the new renewal it's not clear whether the universities are renewing themselves as inward-looking, efficiency-guided institutions for internal efficiency, or its renewal in order to go to a new phase of linkages of relationship with the state, either for democratisation purposes or for development purposes, that is the developmental institutions, hopefully without separating development from democracy. This has not taken place, and so it is a renewal for what? The state looks at the renewal in terms of the institutions becoming self-sufficient. But that does not address the question of: after that, for what? We can churn out degrees, they can be fast, they can be very good degrees or they can be very bad degrees – but for what? So what needs to be debated is what now universities should do in the new dispensation of democratic entrenchment, and whether we can be the new stimulus for rehabilitating growth and development. Some of the work we are doing is related to that because we are not really interested in the internal aspects of the institutions, but we want eventually to ask the bigger questions: once we have become internally efficient, then what? (Senior academic)

Finally, some institutional stakeholders reported that many academics, from a range of disciplines, had been involved in the development of the national *Kenya Vision 2030* document. One respondent held a contrary view, however:

We were not involved [in the development of Vision 2030] as we should have been. The ideas sketched by some fellows in government but at no point did I hear the community of higher education called to debate openly 2030, because 2030 was conceived within the bureaucracy within a political atmosphere. Therefore, in my view, it's still in a sketchy form and we've not

had our input as far as I can tell, and we should have a constant input in 2030. (Senior academic)

Interestingly, there is no specific role for universities identified in the document, as this respondent highlighted:

Of course the 2030 Vision has been there, but [...] there wasn't a very clear involvement of universities to just see how they should really contribute towards the realisation of the Vision. So it has been left to the universities to interpret what is it that they should do. And I believe very strongly that at some point in time the people who are implementing the 2030 Vision must really have some sessions with the universities, so that there is a very clear understanding of the role of the universities in terms of realising the 2030 Vision. Right now if I tell it will be my personal interpretation. (Institutional leader)

3.3.2   Initiatives around research and innovation

Institutional policies, structures and appointments

The university's research policy (UoN 2008b) places considerable emphasis on the role of research for development. For instance, the preamble to the policy makes reference to the Kenya Education Sector Support Programme (KESSP) and, in particular, the National Strategy for University Education reform process which emphasises "the creation of a culture of innovation through acquisition, creation and application of knowledge" (ibid.: iv). Here, the strategic goal for universities relates directly to development: "To improve quality and relevance of learning through research for socio-economic transformation of society" (ibid.). Then, in the background section, the policy refers to the Ministry of Education's reform strategy for universities (ibid.: v):

The Kenya Ministry of Education, in its reform strategy has emphasised the crucial role that Universities can play in promoting Science, Technology and Innovation and Information and Communication Technologies (ICT) all of which are essential in providing Kenya with the essential competitive edge in the knowledge economy. The University's responsibility is to also advise and inform, through research, the Ministry and other government Institutions, on various pressing current issues and concerns connected to sustainable development, such as the environment, including dwindling natural resources.

The research policy also talks about the role of research in improving national productivity (ibid.: 2):

For example, the existing policy and practical gaps that underlie the Millennium Development Goals (MDGs) cannot be adequately addressed without recourse to authenticated data and research findings. Furthermore the improvement of national productivity cannot afford to ignore environmental, global concerns, such as climate change and their impact on food security.

The strategic objectives of the research policy mostly focus on strengthening the academic core of the university in terms of research outputs (postgraduates and research publications) but also make reference to the need to strengthen collaboration with industry in terms of contributing towards economic development goals. The strategic objectives of the research policy include the following (ibid.: 4):

- Transform the university into the leading centre for research;
- Initiate and strengthen collaborative research with national, regional and international institutions;
- Enhance the profile of the university through numerous, top quality journal publications, research citations and research awards;
- Implement thriving postgraduate programmes and maintain a ratio of postgraduate to undergraduate students of one to three; and
- Collaborate with industry in knowledge management, innovation and wealth creation.

The university research policy also makes reference to the fact that in the past, research units have produced "marketable products" but that the commercialisation of these products has "remained elusive" (ibid.: 10). The policy calls for the development of a "clear strategy to link research activity to commercialisation of products" via, for example, the establishment of Science and Technology Parks (ibid.).

The university has also established an Intellectual Property Management Office. According to the web site,[5] the office "is responsible for evaluating, protecting and commercialising University of Nairobi research through licensing to appropriate firms". It also provides advice to staff and students about opportunities for research funding and collaboration, and collaborates with other intellectual property organisations to identify other technologies for possible exploitation.

Research funding

According to respondents, the government's contribution to research funds in the university is negligible. As mentioned in section 2.3.3, the university is able to fund some research activities from the funds that are generated through its Module II (private, fee-paying) academic programmes. According to one

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[5] Intellectual Property Management Office web site: http://www5.uonbi.ac.ke/ip/?q=node/2.

institutional leader, the university is currently investing between KES 500 and 700 million every year in research activities. However, another respondent explained that the research funds available through the university are also negligible, especially for senior researchers:

> *The Deans' Committee is the one that traditionally channels money to researchers. However, the amount of money coming through the Deans' Committee is usually quite small, it would not interest a person like myself because we are talking of several thousand dollars for students to finish their theses or for young academics, fresh PhDs who don't have a name. So it's for junior people and typically the amount is very little; if you get USD 5 000 you've done well.* (Senior academic)

According to one respondent, the private sector and industry provide very little in the way of financial support for research at the university:

> *[...] sometimes from the private sector, but it is very, very little. It's not the kind of money that can mount a three-year programme; it's for small patch-up exercises, one-off kind of thing, but not to support a programme. If you want a big programme then you have to generate that funding yourself. That is the situation. Industry has yet to appreciate the role of research in this country.* (Senior academic)

The university's research policy makes reference to establishing a university research fund "to financially support research on a competitive basis by the provision of short and long term fellowships and competitive grants for research" (UoN 2008b: 7). A senior academic pointed to both the National Council for Science and Technology and the National Commission for Higher Education as having a role to play in raising funds for university research, but that this role has not yet been realised owing to various problems.

By far the largest proportion of research funding to the university is from external donors.

Research themes / focus areas

The university's research policy makes reference to conducting "research in areas where new developments promise to offer and address the salient problems constraining development initiatives in Kenya and Africa" and to "major priority areas within the university research framework [and] global agenda" (UoN 2008b: 5). This implies an institutional research agenda, or research priority areas, but nowhere else is this referred to more explicitly.

3.3.3 Initiatives around teaching and learning

Institutional policies, structures and appointments

There are no policies, structures or appointments that link teaching and learning activities to economic development specifically.

Linkages with the labour market

According to an institutional leader, some of the additional funds generated by the Module II academic programmes are earmarked to fund programmes in priority skills identified by the university council (e.g. engineering).

Departments and faculties are required to engage external stakeholders in their curriculum review and development. An institutional leader mentioned including stakeholders from industry, the private sector, professional bodies and the public sector. This orientation was echoed by other respondents. One institutional leader, for instance, said "there's no point in training people without really checking what the industry wants" and another said "programmes are market-tailored; we don't just shoot out there without interaction with the relevant stakeholders".

An institutional leader made reference to a university policy that all faculties need to develop student attachment / internship programmes in their courses. At the time of the interviews, only some of the academic programmes had instituted attachment or internship programmes and, in many cases, these were experiencing some problems. For example, one respondent reported that feedback from an evaluation that was done suggested that the student attachment programmes of the university were not working optimally – in particular, that there was not "adequate supervision by the faculty" (Institutional leader). Another said that the problem is that there is no curriculum attached, there is no mentoring, nor is there a proper evaluation mechanism.

Part 4

The University of Nairobi academic core

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AT A GLANCE

A profile of the UoN academic core:
- Enrolments in science, engineering and technology
- Postgraduate enrolments and graduation rates
- Academic staff-to-student ratio
- Academic staff qualifications
- Research funding
- Research output

</div>

4.1   Introduction

As outlined in the analytical framework (Section 1.1.3), the nature, size and continuity of the academic core is a key factor in the extent to which universities can make a significant and sustained contribution to development. The academic core of universities refers to teaching via academic degree programmes and to research activities (often, but not exclusively of the basic type). In societies where there is a strong pact between higher education and society, the universities have been able (and allowed) to develop a strong core of academic activities that forms the basis for all their activities. The stronger its academic core the easier it will be for a university to defend its institutional identity and integrity against external or internal threats. In addition, a strong, institutionalised academic core will allow the university to invest a large part of its resources in the maintenance and further strengthening of the core, which can be regarded as the main foundation under its specific institutional identity.

According to Burton Clark (1998), when an enterprising university evolves a stronger steering core, and develops an outreach structure, its heartland is still in the traditional academic departments, formed around disciplines, and some interdisciplinary fields. The heartland is where traditional academic values and activities such as teaching, research and training of the next generation of academics occur.

For the purposes of this project, we have used the following to operationalise the concept of the academic core and to identify important preconditions for the development of a strong academic core in African universities:

- **Increased enrolments in science, engineering and technology (SET):** In African governments and foreign development agencies alike, there is a strong emphasis on SET as important drivers of development (Juma 2005). Included in SET are the agricultural sciences, architecture and urban and regional planning,

computer and information science, health sciences and veterinary sciences, life sciences and physical sciences.

- **Increased postgraduate enrolments:** The knowledge economy and universities are demanding increased numbers of people with postgraduate qualifications.
- **A favourable academic staff to student ratio:** The academic workload should allow for the possibility of research and PhD supervision.
- **A high proportion of academic staff with doctoral degrees:** Research (CHET 2010) shows that there is high correlation between staff with doctorates, on the one hand, and research output and the training of PhD students, on the other.
- **Adequate research funding per academic:** Research requires government and institutional funding and 'third-stream' funding from external sources such as industry and foreign donors.
- **High graduation rates in SET fields:** Not only is it important to increase SET enrolments, it is crucial that universities achieve high success rates in order to respond to the skills shortages in the African labour market in these fields.
- **Increased knowledge production in the form of doctoral graduates:** There is a need for an increase in doctoral graduates for two reasons. Firstly, doctoral graduates form the backbone of academia and are therefore critical for the future reproduction of the academic core. Secondly, there is an increasing demand for people with doctoral degrees outside of academia (e.g. in research organisations and other organisations such as financial institutions).
- **Knowledge production in the form of research publications recognised in ISI journals:** Academics need to be producing peer-reviewed research publications in order for the university to participate in the global knowledge community and to contribute to new knowledge and innovation.

The preconditions outlined above are translated into the following academic core indicators:

Indicator 1:   Programmes – Strong SET enrolments and graduations
Indicator 2:   Postgraduates – Increased enrolments and graduations
Indicator 3:   Teaching loads – Improving academic staff/student ratios
Indicator 4:   Qualified staff – High percentage academic staff with PhDs
Indicator 5:   Funding – Availability of research funds
Indicator 6:   Research output – High or improving output

In order to develop a benchmark against which the UoN academic core could be assessed, an analysis was undertaken of South Africa's 22 contact universities and the seven African universities included in the current study, based on seven input indicators and two output indicators. (See Appendix 2 for a description of the cluster analysis methodology, the detailed data for the institutions included in the analysis, and a graph showing the results of the analysis.) A cluster analysis of the results produced the following four clusters of institutions:

- **Cluster 1** consists of the five South African universities which have a strong focus on both undergraduate and postgraduate studies, which are well-resourced in teaching and in research, and which have strong research outputs.

- **Cluster 2** consists of two South African and five African universities which have a primary focus on undergraduate studies, which have adequate undergraduate teaching resources, and which have good undergraduate but moderate research output rates.

- **Cluster 3** consists of eight South African and two African universities which have high proportions of SET students, which have a main focus on undergraduate studies, but which do not have available the same levels of undergraduate teaching resources as Cluster 2. Their undergraduate output rates are satisfactory, but their research output rates fall below the targets set for South African universities.

- **Cluster 4** consists of eight South African universities which have low proportions of postgraduate students. Their resource levels are low compared to the other three clusters, their output rates at undergraduate level are unsatisfactory, and their research performance is poor.

UoN appears in Cluster 3 together with Ghana, North West, KwaZulu-Natal, Free State, Nelson Mandela, UWC, Venda, Zululand and Fort Hare. In the analyses which follow, UoN (which had an enrolment of 39 000 in 2007) is linked to (a) the other African university in Cluster 2 (Ghana which had an enrolment of 21 000 in 2007) and (b) KwaZulu-Natal (UKZN) (which had an enrolment of 38 000 in 2007).

UoN is also compared to the Cluster 1 university which is closest to it in terms of enrolment size. This is the University of Pretoria which had an enrolment of 49 000 in 2007.

4.2 SET enrolments and graduations

Figure 4.1 shows that UoN's enrolments increased by 16 700 (or 74%) in 2007 compared to 2001. Enrolments in SET increased by 4700 (or 62%) in 2007 compared to 2001, business/management enrolments by 2900 (or 59%), and humanities plus education by 9100 (or 89%). Graph 1 shows that proportion of SET majors fell slightly from 33% in 2001 to 31% in 2007. UoN's overall shape by field of studies remained constant over this period.

Figure 4.1: Nairobi: Enrolments by field of study

■ Science & technology   ■ Business & management   ■ Humanities
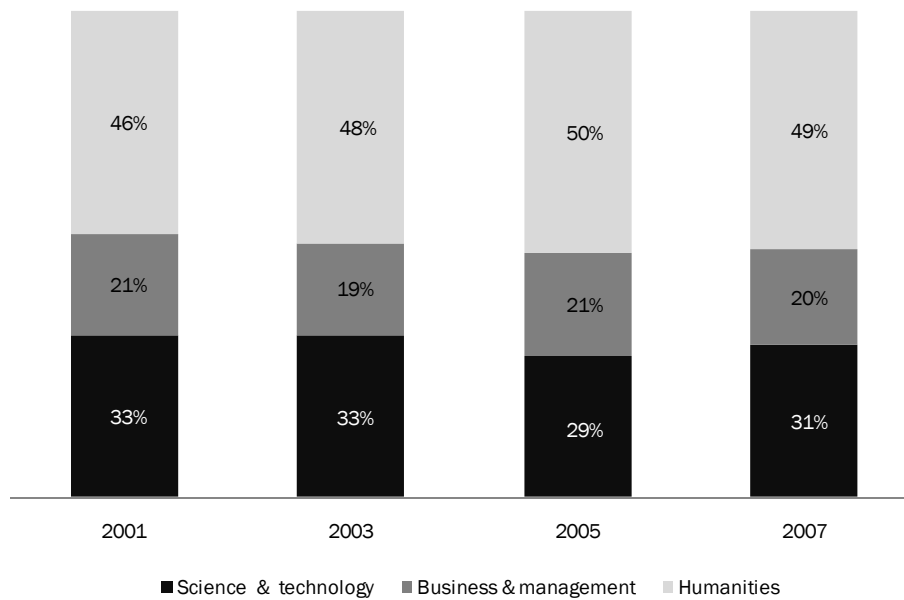
Table 4.1: Nairobi: Total enrolments by field of study (thousands)

Field of study	2001	2003	2005	2007	Average annual growth rate: 2000-2007
Science and technology	7.6	7.9	9.4	12.3	8.4%
Business and management	4.9	4.7	6.9	7.8	8.1%
Social sciences, humanities and education	10.3	11.5	16.1	19.3	11.2%
Totals	22.8	24.1	32.4	39.4	9.6%

UoN had, in 2001, a SET proportion which was comparable to those of UKZN and Pretoria (Figure 4.2). Compared to the other two, its share did, however, slip after 2005.

Figure 4.2: Comparison of science and technology majors as % of total enrolment
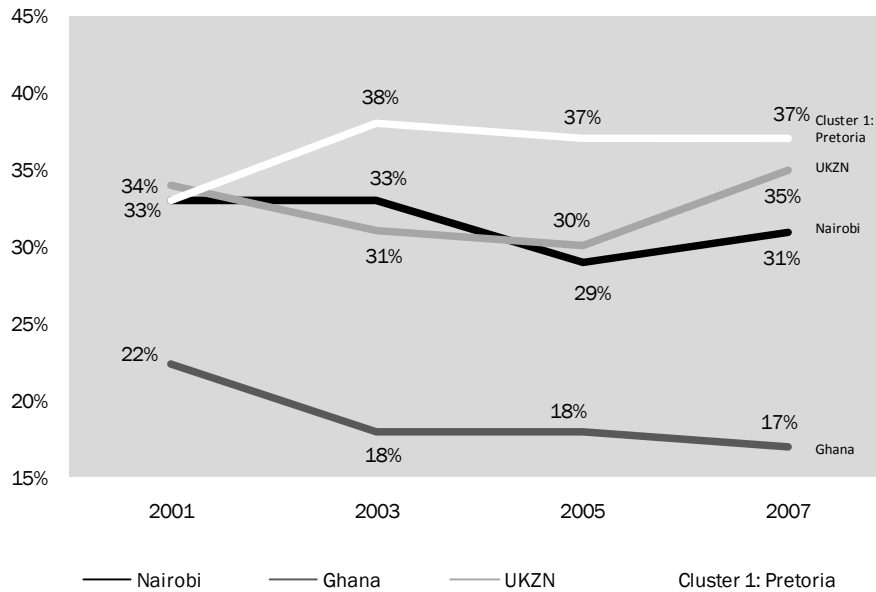
Table 4.2: Comparison of total science and technology enrolments (thousands)

	2001	2003	2005	2007
Nairobi	7.6	7.9	9.4	12.3
Ghana	3.2	3.6	4.7	4.5
UKZN	11.5	13.6	12.3	13.1
Cluster 1: Pretoria	13.8	15.8	17.4	18.1

The data in Figures 4.3 and 4.4 measure output performance in terms of a university's ratio between graduates in any given year and student enrolments in that same year. These ratios serve as proxies for cohort output rates, which indicate what proportion of any cohort entering a university can be expected to eventually complete their degrees or diplomas. The benchmark of 25% is a proxy for a cohort success rate of 75% of entering students obtaining their degrees or diplomas.

Figure 4.3 shows that UoN's average graduate rate for SET declined over this period 2001 to 2005, but then moved up sharply in 2007. The increase in 2007 was the result of an additional 2 000 students graduating in SET in 2007 compared to 2005. UoN's average graduation rate for all programmes was 17% which is equivalent to a cohort success rate of 50%, which indicates that its historical SET graduate output rate has been inefficient.

Figure 4.3: Nairobi: Graduation rates by field of study
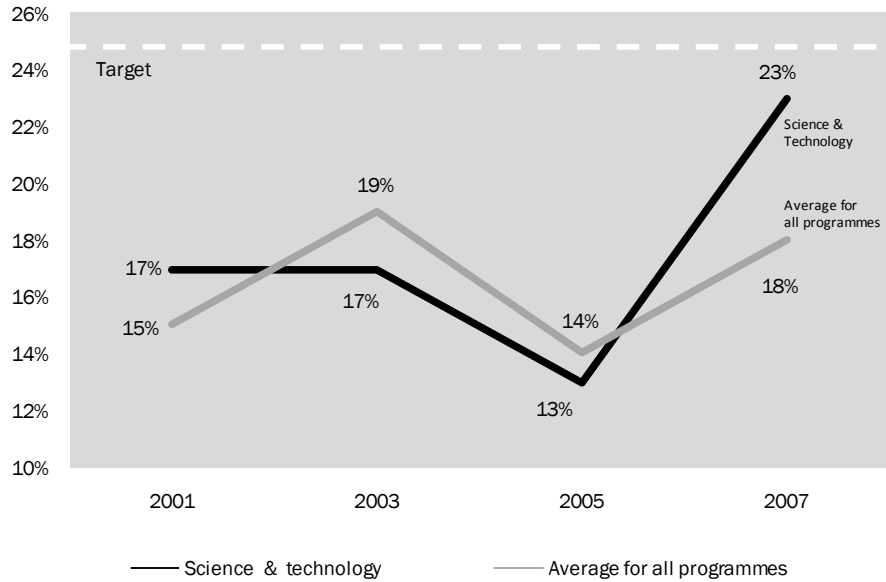
Table 4.3: Total SET graduates

	2001	2003	2005	2007
Nairobi	1 314	1 383	1 239	2 804

Figure 4.4 shows that UoN's performance in producing SET graduates was close to that of the other two Cluster 2 universities. UoN's average graduation rate 17% for SET for the period 2001-2007 is equivalent to a cohort success rate of 53%, which is clearly not satisfactory. The average cohort success rates for 2001-2007 for SET for the other universities were: Ghana and UKZN 50%, and Pretoria 60%.

Figure 4.4: Comparison of science and technology graduation rates
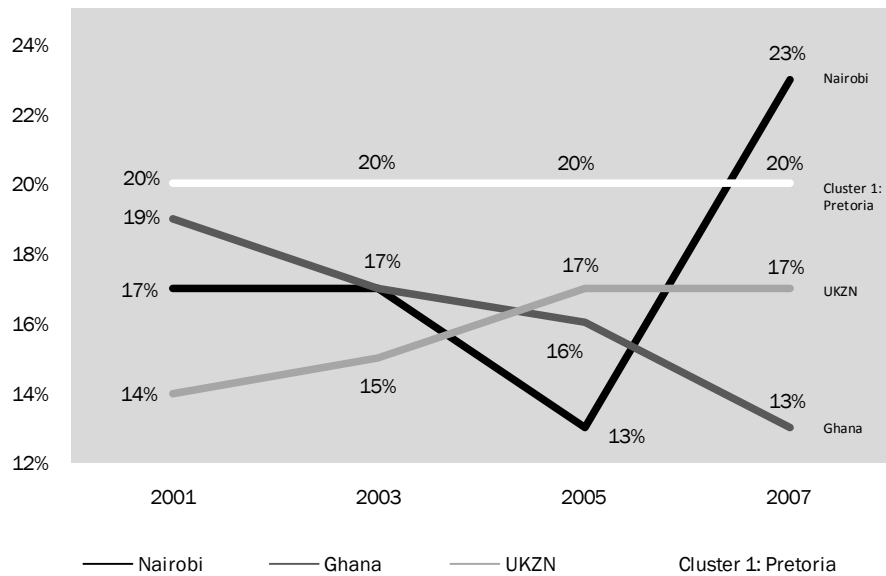
Table 4.4: Comparison of total science and technology graduates

	2001	2003	2005	2007
Nairobi	1 314	1 383	1 239	2 804
Ghana	611	608	740	579
UKZN	1 657	2 011	2 078	2 184
Cluster 1: Pretoria	2 820	3 232	3 536	3 619

4.3 Postgraduate enrolments and graduations

Figure 4.5 shows that the proportion of postgraduate students in UoN's total enrolment fell from 20% in 2001 to 16% in 2007. The reason was that UoN's postgraduate enrolments grew, between 2001 and 2007, at a lower average annual rate than undergraduates. These average annual increases were 6.1% for postgraduates and 10.3% for undergraduates. The graph also shows that UoN's 2007 proportion of postgraduates was about half of that of the Cluster 1 university, Pretoria.

Figure 4.5: Comparison of % postgraduates in enrolment total
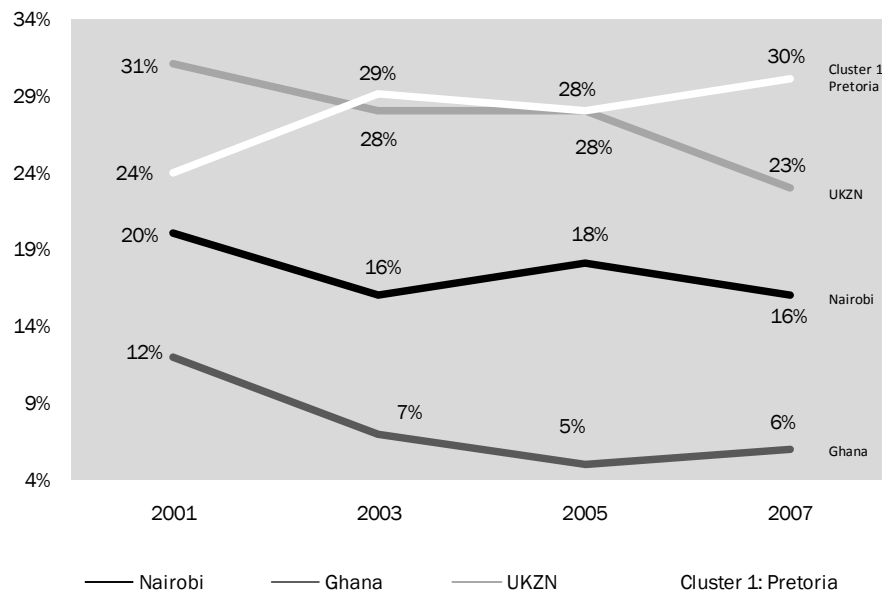
Table 4.5: Comparison of total postgraduate enrolments in all fields of study

	2001	2003	2005	2007
Nairobi	4 455	3 783	5 845	6 367
Ghana	1 641	1 395	1 433	1 682
UKZN	10 478	12 205	11 397	8 874
Cluster 1: Pretoria	9 993	12 306	12 753	14 566

Table 4.6 gives for UoN only, details of masters and doctoral enrolments and graduates over the period 2001 to 2007. The table shows that masters enrolments increased by 2 208 (or 64%) and masters graduates by 618 (or 167%) in 2007 compared to 2001. UoN's graduation rate for masters graduates was, however, below the targets set for South African universities. The average ratio of masters graduates to masters enrolments for the period was 15%, which implies that masters students could be taking six years to complete their degrees.

Doctoral enrolments dropped from 190 in 2001 to only 62 in 2007.

Table 4.6: Nairobi: Master and doctoral enrolments and graduates

	2001	2003	2005	2007	Average annual growth: 2000-2007
Masters					
Enrolments	3 937	3 376	5 332	6 145	7.7%
Graduates	370	694	576	988	17.8%
Doctoral					
Doctoral enrolments	190	81	170	62	-17.0%
Doctoral graduates	26	32	7	32	3.5%
Total masters + doctoral					
Enrolments	4 127	3 457	5 502	6 207	7.0%
Graduates	396	726	583	1 020	17.1%

Since doctoral students, especially in SET, are essential parts of research programmes, Figure 4.6 can be used as a first measure of a university's involvement in research. A university which has strong research programmes should have reasonably high proportions of doctoral students in its grouping of masters plus doctoral students.

The graph shows that, for the period 2001-2007, UoN enrolled on average 32 masters students for each doctoral student enrolled, which is a high ratio, indicating that the flow of masters through to doctorates was low. The

comparable ratios for the other universities in the selected group are: Ghana 16 masters enrolments per doctoral enrolment, and UKZN and Pretoria both 4. These last two universities have well balanced masters to doctorate student ratios.

Figure 4.6: Comparison of doctoral enrolments as % of masters and doctoral enrolments
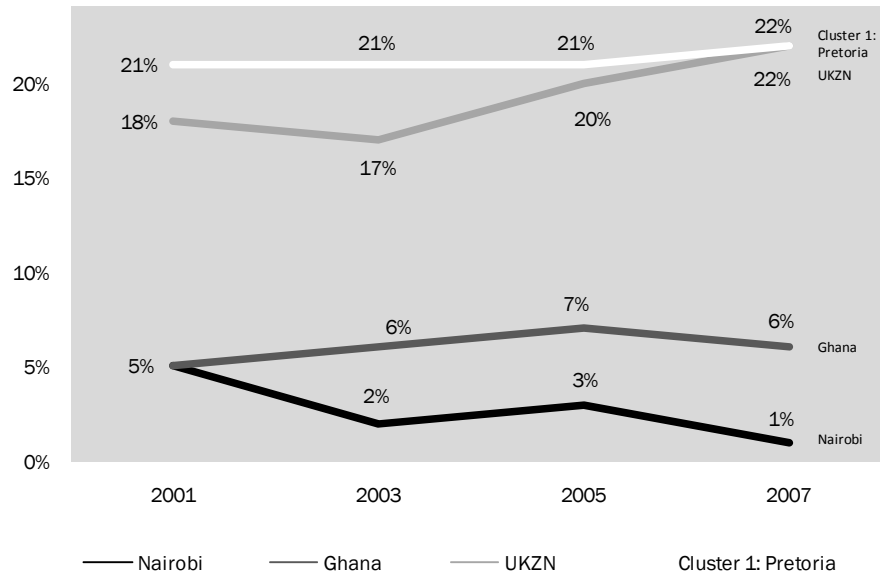
Table 4.7: Comparison of masters and doctoral enrolments

	2001		2003		2005		2007	
	Masters	Doctoral	Masters	Doctoral	Masters	Doctoral	Masters	Doctoral
Nairobi	3 937	190	3 376	81	5 332	170	6 145	62
Ghana	1 344	69	1 272	79	1 337	94	1 580	102
UKZN	3 457	773	4 535	960	4 343	1 081	3 884	1 117
Cluster 1: Pretoria	4 858	1 284	5 907	1 529	5 714	1 546	5 399	1 495

Figure 4.7 compares the total numbers of doctoral graduates produced by each of the four universities between 2001 and 2007. UKZN produced 33%, and Pretoria 53%, of the total doctoral graduate output of these four universities in 2007.

Figure 4.7: Comparison of total doctoral graduates
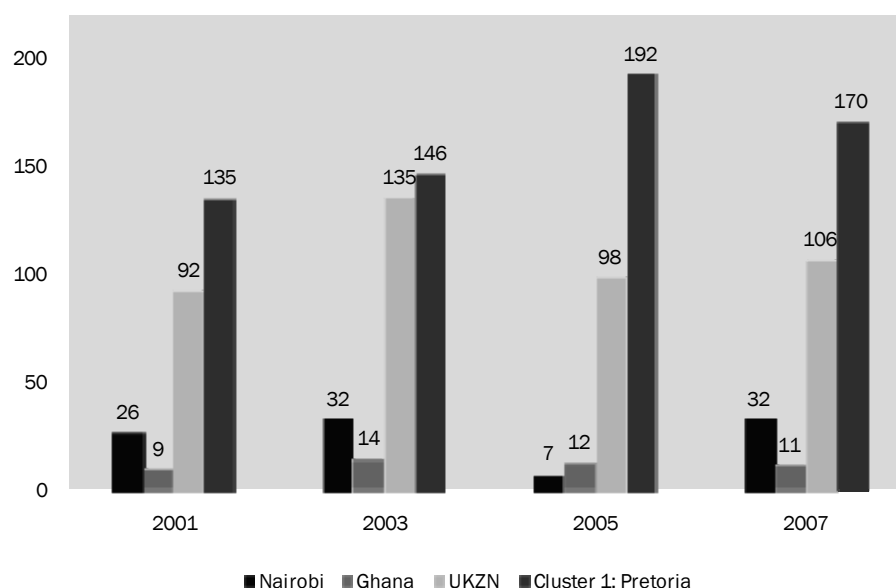
Table 4.8: Comparison of doctoral graduates

	2001	**2003**	**2005**	**2007**
Nairobi	26	32	7	32
Ghana	9	14	12	11
UKZN	92	135	98	106
Cluster 1: Pretoria	135	146	192	170

4.4   Student-staff ratios

Data on the formal teaching hours carried by academic staff at the four universities are not available. Use has therefore been made of proxies, which compare student to academic staff growth rates and ratios of full-time equivalent (FTE) students to FTE academic staff.

Table 4.9 shows how UoN's totals of FTE students and FTE academic staff changed over the period 2001 to 2007. UoN was not able to match growth in FTE students and FTE academic staff in any of the broad fields of study. FTE student to FTE academic staff nevertheless remained favourable in all these fields, except business and management. The ratio for SET remained below 10:1, even though the average annual growth in FTE academic staff was less than 1% compared to the nearly 8% growth rate in FTE students in SET.

Table 4.9: Nairobi: FTE students and academic staff

	2001	2003	2005	2007	Average annual growth: 2000-2007
Science and technology					
FTE students	5 259	5 496	6 172	8 165	7.6%
FTE academic staff	843	843	881	888	0.9%
FTE student to FTE academic ratio	6.2	6.5	7.0	9.2	
Business & management					
FTE students	2 903	2 355	3 549	4 192	6.3%
FTE academic staff	103	97	99	99	-0.7%
FTE student to FTE academic ratio	28.2	24.3	35.8	42.3	
Humanities plus education					
FTE students	7 248	7 422	9 897	11 758	8.4%
FTE academic staff	358	328	359	376	0.8%
FTE student to FTE academic ratio	20.2	22.6	27.6	31.3	
TOTALS					
FTE students	15 410	15 273	19 618	24 115	7.7%
FTE academic staff	1 304	1 268	1 339	1 363	0.7%
FTE student to FTE academic ratio	11.8	12.0	14.7	17.7	

Figure 4.8 compares FTE student to FTE academic staff ratios for 2007. The average ratio for all four universities was 21 or less, which is regarded as satisfactory in terms of South African norms. It is worth noting that while the SET ratios of all four are satisfactory, the Cluster 1 university had the highest ratio of SET FTE students to FTE academic staff. In all four the ratio for business/management was high, and in UoN and Pretoria the humanities plus education ratio was over 30:1.

Figure 4.8: Comparisons of 2007 FTE student-staff ratios
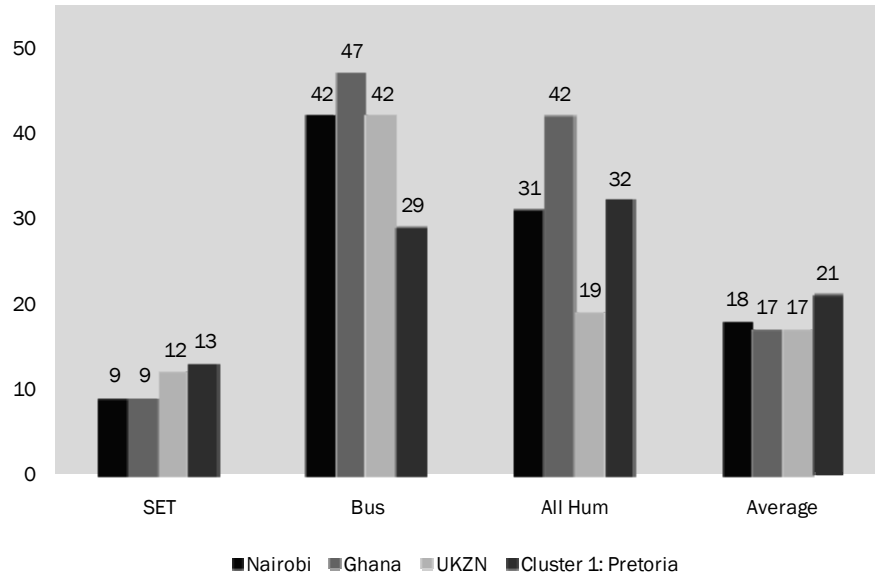
Figure 4.9 compares the four universities' 2007 totals of permanent academic staff and FTE academic staff. Figure 4.10 can function as a proxy of the load carried by permanent academic staff members, who are expected to be the main supervisors of research students and producers of research publications. Figures 4.9 and 4.10 show that the permanent academic staff at Pretoria have the highest level of support from temporary and part-time academic staff. Pretoria had, in 2007, 1 619 permanent academics and the equivalent of a further 199 part-time and temporary academic staff. UoN had 1 292 permanent academics and the equivalent of a further 71 temporary and part-time academic staff members.

Figure 4.9: Comparison of totals of permanent and FTE academic staff (2007)
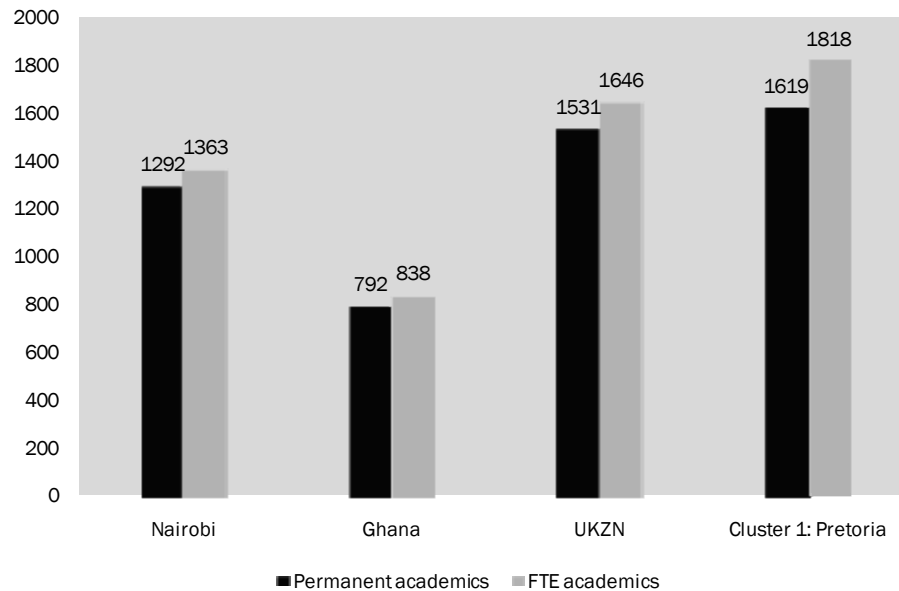
Figure 4.10: Comparison of ratios of FTE to permanent academic staff (2007)
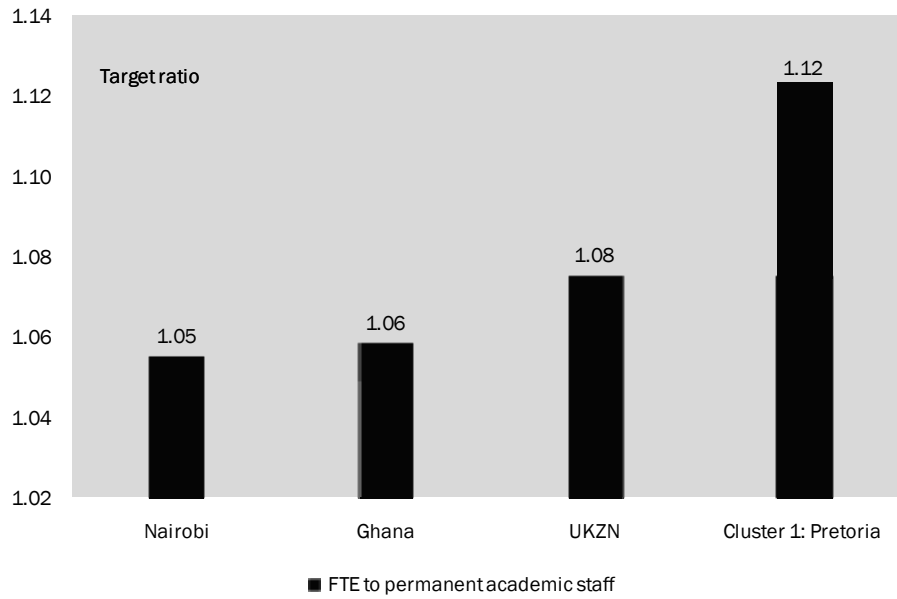
4.5   Academic staff qualifications

Figure 4.11 compares the 2007 proportions for the cluster of the permanent academic staff who have either a masters or a doctorate as their highest formal qualification. UoN's ratio of 71% of permanent academics with doctorates would be regarded as exceptionally high in the South African university system.

Figure 4.11: Comparison of highest formal qualifications of permanent academics (2007)
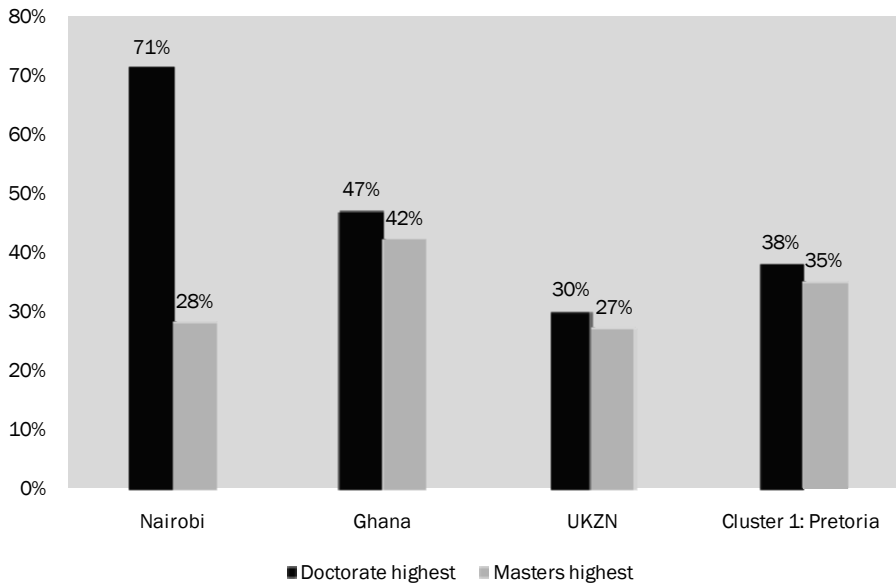
Table 4.10: Comparison of permanent academics with masters and doctoral degrees (2007)

	Nairobi	Ghana	UKZN	Cluster 1: Pretoria
Doctorate highest	915	405	466	621
Masters highest	363	364	407	565
Lower than masters	14	96	658	433

4.6 Research funding[6]

The information in Figures 4.12 and 4.13 attempts to set out the totals which each university had available for research in 2007. It should therefore reflect research income rather than expenditure on research.

In their annual income statements, South African universities report on their research funding in terms of recurrent research income and research contracts for designated purposes. Pretoria's 2007 income statements gave its recurrent research income as R 0 and its designated research contract income as R 116 million.

UoN, Ghana and UKZN did not provide specific information on research funding. In the analyses which follow, assumptions are made that their research income = 3% of their total income.

The calculations of market rate dollars are based on average exchange rates quoted by the central banking authorities of each country.

The calculation of Purchasing Power Parity dollars (PPP$) is based on estimates contained in the 2008 publication on *World Development Indicators* (World Bank 2008). Because these estimates are based on 2005 exchange rates, the following method was used for the 2007 calculations:

- The indicator set gives for each country a ratio between the PPP conversion factor and the market exchange rate. For example, the South African ratio is given as 0.61, based on a market exchange rate of R 6.4 per USD in 2005.
- The 2007 calculations assume that the 2005 ratio will apply again. So the 2007 PPP conversion factor is taken to be 2005 ratio times 2007 market exchange rate. For example, the conversion factor for South Africa is calculated as 2005 ratio times 2007 exchange rate = 0.61 X 7.0 = 4.27.

These calculations are based the research income totals referred to above. The amounts in local currency were converted to market rate USD and PPP$ dollars using the methodology referred to at the beginning of this section.

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[6] It must be noted that all universities in the sample appear to use different means to estimate their research income. For the purposes of comparison where no figures have been supplied a percentage of university income has been used. These figures however are not reliable and more work needs to be done in further studies to accurately track university research income.

Figure 4.12: Comparison of research income in market rate USD and PPP$ (millions)
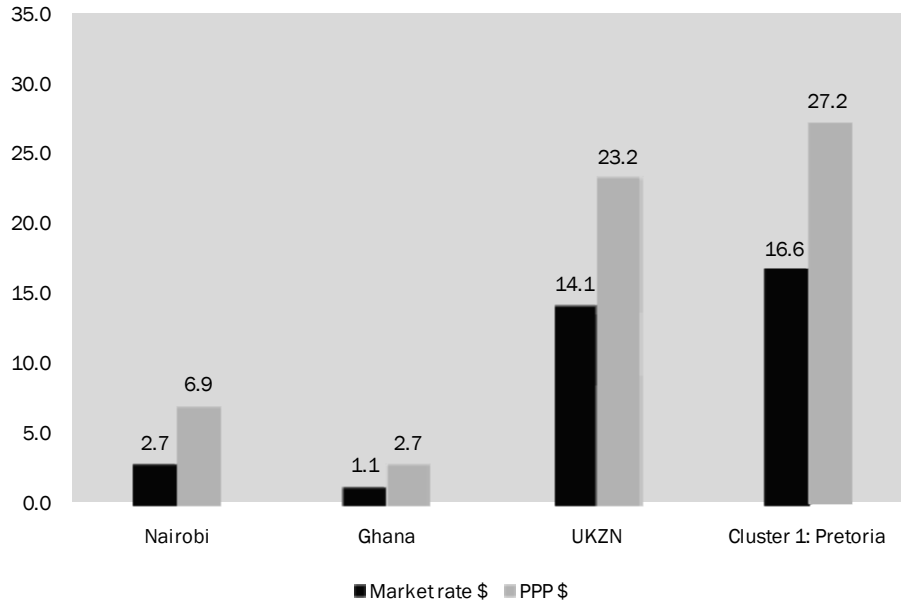
Figure 4.13 is based on the actual and assumed research income totals in Figure 4.12 and the permanent academic staff totals in Figure 4.9.

Figure 4.13: Comparison of total research income per permanent academic in market rate USD and PPP$ (thousands)
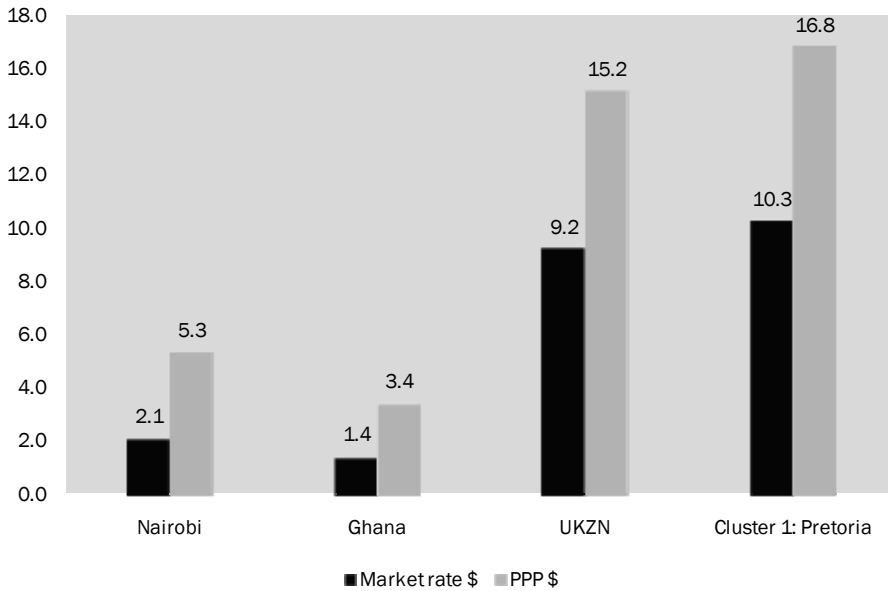
4.7   Research outputs

For the purposes of this study, research outputs are measured in terms of research publications[7], and doctoral graduates. Table 4.11 lists UoN's totals of research publications and doctoral graduates for the period 2001–2007.

Table 4.11: Nairobi: Research outputs

	Research publications	Doctoral graduates
2001	115	26
2003	100	32
2005	93	7
2007	136	32

Figure 4.14 deals only with research publication units. The target is based on the assumption that a permanent academic should publish at least one research article every two years. The data in the graph show that UKZN and Pretoria met this target. The ratios of UoN and Ghana suggest that each permanent academic will publish one research article every 8 to 10 years.

Figure 4.14: Comparison of research publication units per permanent academic

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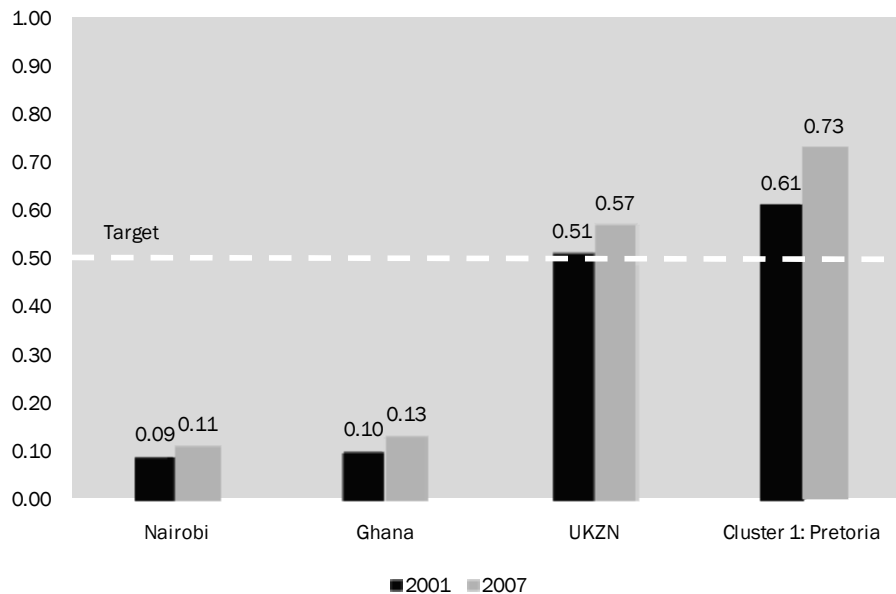
[7] The research publication data presented here are based on the peer reviewed research publications data in the Web of Science citation database within the ISI Web of Knowledge, produced by Thomson Reuters. The database captures papers from all countries that are published in journals that meet certain criteria of quality as determined by Thomson Reuters.

Figure 4.15 sets out ratios between doctoral graduates and permanent academic staff, with the target again being derived from the research output targets used in the South African higher education system. In this case, the target takes account of the productivity of academic staff in terms of the total of doctoral graduates produced in a given year divided by the total of permanent academic staff employed in that year. The target ratio of 10% is based on these calculations:

At least 50% of the permanent staff of a university should be supervising at least one doctoral student, and these students should take on average five years to complete their degrees. So a university with (say) 100 permanent academics should enrol at least 50 doctoral students, and 20% of these should graduate each year. The ratio between permanent staff and doctoral graduates should therefore be at least 10/100 = 10%.

The data in the graph show that Pretoria exceeded this target in 2007 and came close to it 2001. KwaZulu-Natal's ratio was below the ratio in both years. The other two universities in the group fell well short of the target of 10%.

Figure 4.15: Comparison of doctoral graduates in given year as % of permanent academics employed
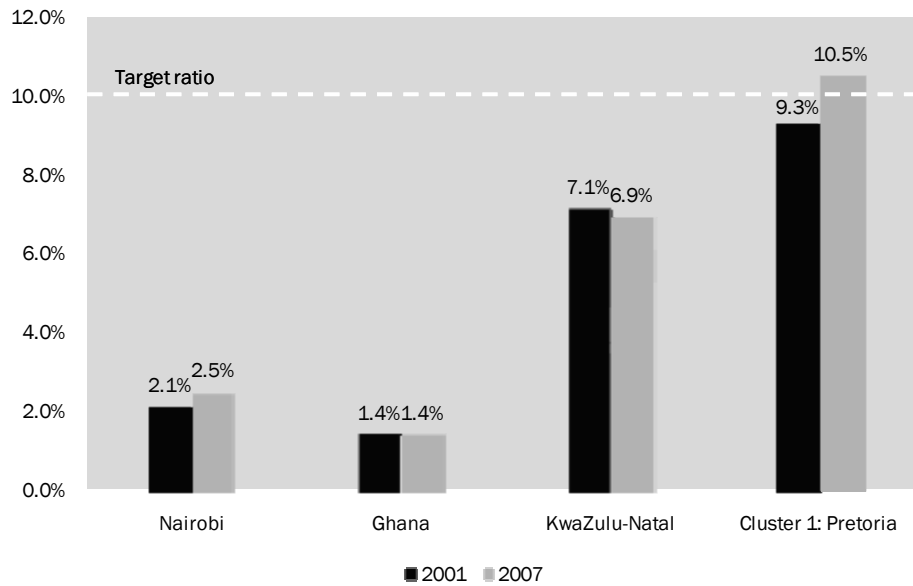
Part 5

The engagement and development-related activities of the University of Nairobi

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AT A GLANCE

- University engagement and linkages with government and industry
- Incentives for academics to engage in development-related activities
- Coordination of development activities
- Connectedness of economic development-related projects and centres to the academic core

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5.1 Introduction

In order to ensure that the core activities of teaching and research are to some extent aligned with national development priorities and can thereby contribute to development in society, universities increasingly emphasise the need to engage with relevant external stakeholders. Furthermore, much of what might be termed the development-related activities of the university usually fall within the so-called 'third mission', which is variously referred to as 'engagement', 'service' or 'community outreach'. This could include academics serving on committees in the public or private sector, providing support to small businesses, responding to requests for short courses, or undertaking contract research for outside clients. More often than not, the economic development-related projects and activities of the institution fall under its engagement function.

In the first part of this section, we explore the UoN's engagement with its key external stakeholders, namely government, industry and foreign donors. In the second part of the section, we turn our attention to an analysis of the extent of the connectedness of the economic development-related centres and projects included in this study.

5.2 Engagement and linkages with external stakeholders

In the previous university strategic plan (2005-2010), one of the strategic objectives was "To mainstream consultancy as a core function of the University" (UoN 2005: 10). The rationale for this move is explained as follows (ibid.: 33):

The university in any society exhibits the greatest concentration of people with expertise and knowledge that can be gainfully utilised in solving societal problems through consultancies and innovations. Given the interdisciplinary nature of our academic and research activities, the University of Nairobi should mainstream consultancies and community service as part and parcel of its core business. The desired position is to have the University as a major provider of consultancy services in the region. In this regard, the University intends to foster strategic alliances and partnerships with other local and international institutions.

As was mentioned in section 3.3.1, consultancy is seen as the primary set of activities through which to address national development needs.

5.2.1 University-government-industry linkages

Historically speaking, a couple of respondents pointed to the different relationship that the university had with different government regimes. They both noted that at a certain point, there was a bad relationship between the university and the government which resulted in a lack of funding from the government:

I think for the immediate post-independence the universities were completely funded by government. Then two things happened – one, it was more general, and that is that there were things like structural adjustment programmes and that governments were discouraged from providing full support for anything. Also in the 1980s the relationship between universities and the Moi government here was not good; there was a lot of anti-intellectualism, a lot of fear that everybody, every university lecturer was a potential communist spy, etcetera, etcetera. So I think that was another – and a lot of qualified people left the university at that time. (Senior academic)

When the university started drifting from its developmental mandate [post-independence] and started assuming a different kind of a role as conscience of society, if you want to call it that, and became more and more alienated from the state – that hurt because there was very little funding coming from the government. In fact, during the Moi regime it's true to say that research was regarded as a subversive activity as with all dictatorial regimes, so it was to their interest not to fund the university. (Senior academic)

Regarding the university's relationship with government today, there were some mixed views. On the one hand, according to one institutional leader, the university is usually the first choice for government when assistance is needed with policy development: "The University of Nairobi tends to be the university of choice in terms of linking up with most of the government policy work and research and things like that." Other respondents reported that many UoN academics had been involved in the development of *Kenya Vision 2030* – from economics, sociology, political science and administration, amongst others.

On the other hand, however, some respondents were quite sceptical about how the university is perceived by the government:

> *In fact, we think that the university has a lot to offer in terms of things that we can do that will inform policies, but many times you'll find the Chief of Engineers in the civil service saying: oh, you at the university, you are too theoretical, too scientific – we want practical things.* (Institutional leader)

> *Although Kenya has opened dramatically in terms of political space in the last seven, eight years, I still sense that there is still what I'll call residue mistrust between the state and the higher education institutions. It's not discussed openly but I get the impression that we are still not fully trusted. A few of us get co-opted from time to time, a professor appointed here and there. But that residue of mistrust is still there; in other words, the knowledge industry is not going to be allowed to drive the development process in this country.* (Senior academic)

Interestingly, the previous strategic plan (2005-2010) makes reference to the institution's desire to seek greater autonomy from the state. For instance, it says the following (UoN 2005: 35):

> *University of Nairobi operates under an Act of Parliament, the University of Nairobi Act (1985). Being a public institution, the University is also subject to the State Corporations Act, which tends to be more restrictive than facilitative. The contemporary environment requires a prudent and more businesslike approach in the management of the University in order to seize the emerging opportunities. It is expected, therefore, that the University will negotiate for greater autonomy and freedom of operation in order to achieve the desired goals.*

This is later articulated as a strategy ("Seek greater autonomy and strengthen the University's ability to determine its own direction and operations") under the objective of achieving a more enabling legislative and regulatory framework (ibid.: 44).

Despite these kinds of concerns, numerous examples were highlighted during the interviews of linkages with government agencies at the level of individual units and projects. The following is just one such example of the ways in which the academics in one department link with government:

> *We have been using several methods. One of them is through the papers – the government advertises they want consultants or they want researchers or experts in a certain area and we make a deliberate effort to form a team and then apply accordingly; if it's an expression of interest or a request for proposal, fill in the required forms. So that has been one of the methods, because the government is encouraging the competitive aspect, especially in our area, of sourcing experts. We have had cases whereby the government has gotten in touch with us directly, written a letter asking for a nomination by the department of an expert in a certain area. [...] In some other cases the government has appointed some of us directly to perform certain functions. For example, I am sitting in an inter-ministerial committee that is transforming the functions of the National Meteorological Service to become a semi-autonomous government agency. So the committee asks various ministries, Ministry of Finance, Ministry of Environment, Transport, the State Law Office and others, and we are basically discussing policy issues related to how this should happen. That was a direct appointment in the sense that I was requested if I can take it up. We have colleagues who have been appointed to lead regional institutions, like we have one of the institutions in our area, it's called IGAD Climate Prediction and Applications Centre where the head of the institution is from the Department. They are involved in policy development, policy analysis, and in that sense is making a contribution in that sense.* (Senior academic)

There were hardly any examples of linkages with the private sector or industry. The previous strategic plan (UoN 2005: 32) makes reference to a study undertaken for the Commission for Higher Education which "confirmed that relatively low collaboration exists between universities and industries" in Kenya in relation to teaching and learning, as well as R&D initiatives.

One of the strategic areas in the current institutional strategic plan is that of strengthening and extending partnerships and linkages with external stakeholders (UoN 2008a: 5). One of the strategies in this regard is to "Establish viable University industry linkages in areas of research, development and academic chairs" (ibid.). This is further emphasised in the university's research policy which encourages partnerships between research units and the private sector / industry through joint research ventures and contract research (UoN 2008b:8).

5.2.2 Foreign donors

According to one senior academic, in general they do not experience conflicts of interest with external donors, and that these are managed from the outset:

> *We would see it as natural and understandable in the sense that a donor would, they have their expectations and their expectations must be met. What we normally do, we start by having a memorandum of agreement. If it's a long-term project, like this one now we are going to finish with the University of Wales in Cardiff – so that we agree at the very beginning, they say: these are our expectations, we also say: this is what we expect and this in line with our vision, mission, and so on. So we strike a balance at the beginning. This is what we have found as probably for now the suitable method to move forward. In the past we would start a process and then in the middle the interests, as you put it, brings that tension. I want to move in this direction but the donor is saying: no, no, no, you cannot move in that direction – so we try to do this at the very beginning through the memorandum of understanding. [...] Sometimes we are forced to just go by the donor, especially for the consultancies for obvious reasons, because somebody will want some work done in a certain specific way. If it doesn't interfere with our vision and mission then we just go ahead. So I wouldn't say there's a conflict.* (Senior academic)

Another respondent pointed to some recent changes – especially amongst the American donor agencies like USAID and Rockefeller, which are no longer funding research in the universities directly, but rather through civil society organisations. According to this respondent, this is leading to fragmentation and projectisation:

> *The problem with funding through civil society is that funding gets fragmented. You fund a million-and-one little activities and somebody like me, who has gone through that phase, and now we want a programme of five, six years because we are tired of running to the field every three weeks with minor little projects, which is a natural outcome of maturing and aging, so you don't want to be running – you want to sink your teeth into a five-year programme. It's very difficult to get that kind of a thing from a US foundation.* (Senior academic)

5.2.3 Incentives, rewards and coordination

According to an institutional leader, until recently, research activities in the university have gone largely uncoordinated. In particular, there was no

institution-level unit responsible for coordinating research and that much of the research that was done for outside organisations (e.g. government or donors) was negotiated by individuals within academic units. More recently, the Deans' Committee – essentially the university's research committee –established two research units (for the sciences and social sciences) which are now responsible for coordinating research activities in their respective disciplinary areas. There are now also plans to establish an office for a deputy vice-chancellor for research and development.

The University of Nairobi Enterprises and Services (UNES) Ltd was established in 1996 with the aim of promoting and coordinating the various income-generating activities of the university, including teaching, research and consultancy activities. UNES is registered as a private company, limited by shares, and operates as a separate legal entity, independent of the university. According to the web site[8], UNES was established to undertake the following activities:

- Harness the resources of the university with a view to enhancing the university's teaching and research capabilities;
- Promote, coordinate and provide managerial services for income-generating activities within the university;
- Undertake consultancy, research, production and other income-generating activities and promote and facilitate such activities undertaken by departments and other units of the university;
- Provide managerial services for consultancy, research, production and other income-generating activities to the departments, faculties and other units of the university; and
- Register patents of any inventions and innovations in which the company will have made a contribution.

UNES tends to focus on working with those consultancies that require a group or consortium, as opposed to individual consultancies. In terms of facilitation, it keeps an eye out for calls for proposals and then approaches individuals or groups whom it thinks might be interested (from a list of academics who have registered themselves with UNES). UNES then works on the 'business' side of the proposal (including the budget) while the academic team works on the technical aspects.

There was no evidence that there are specific incentives or rewards to encourage development-related activities in particular. However, the previous strategic plan (2005-2010) makes reference to the intention to establish rewards (criteria for promotion) for consultancy activities, although it is not clear whether these have been realised (UoN 2005: 42-43):

> *The consultancy that normally comes to the University is privately sourced by individual staff members or small teams, with minimal reference to the University. Consultancy has not*

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[8] UNES web site: http://www.uneskenya.com.

been fully integrated into the reward system of the University. To this end the University shall put in place attractive policies and regulations, which elevate consultancy to the level of integral and mainstream activity of members of staff at all levels.

5.2.4   Summary

While there appear to be some significant linkages with government agencies at the level of individual units and projects, the relationship between the university and government at the broader level seems to have gone through some difficult times. There is considerably less interaction between the university and industry.

UNES is the main institutional level unit which plays a role in coordinating internal and external interests, although this is also done at the lower levels. And, while consultancy has been mainstreamed, there do not appear to be any concrete mechanisms in place for incentivising or rewarding development-related activities.

5.3   The connectedness of development activities to the academic core

A key issue for the relationship between higher education and economic development is to establish a *productive* relationship between knowledge and connectedness. On the one hand, if there is an overemphasis on the basic knowledge activities of teaching and research – in other words, an excessive inward orientation towards strengthening the academic core – this results in the university becoming an 'ivory tower'. Or, if the academic core is weak, an overemphasis on knowledge results in the 'ancillary' role of the university (i.e. no direct role in development). On the other hand, if there is an overemphasis in the university on connecting to development activities, then it weakens the academic core and the university has little new or relevant knowledge to offer in the exchange relationship.

The challenge for universities, then, is to deal with this inherent tension between 'buffering' (protecting) the core technologies of the institution, and 'bridging' (linking) those with external actors (Scott 2001: 199-211). In reality, the boundaries between internal and external are not that clear cut. A number of theorists, such as Gibbons *et al.* (1994) and Scott (2001), have argued that during globalisation and its associated 'new' forms of knowledge production, the boundaries are becoming increasingly blurred and permeable.

The higher education studies literature describes this problem in terms of the conceptual notion of 'coupling' (Scott 2001; Weick 1976); that is, the extent to which the core and the external (or 'periphery') are linked with, or connected to, one another. In 'tight coupling', the boundary is weak and the university is in a direct, 'instrumental' relationship with external actors such as government or

industry. In 'loose-coupling', the boundary is stronger, such as in the traditional notion of the university as a self-governing institution, which assumes an indirect contribution to development. The more complex relationship is with the 'engine of development' notion where there are multiple, simultaneous forms of knowledge production and exchange.

For the purposes of this study, we are using the term 'connectedness' to refer to the relationship (and tension) between the inward focus on strengthening and maintaining the academic core, and the outward focus on linking with external stakeholders and development. We operationalised 'connectedness' along two dimensions. The first dimension is 'articulation' which has a number of aspects. Firstly, it refers to the extent to which the aims and activities of development-related activities articulate with national development priorities and the university's strategic objectives. Secondly, it refers to the linkages the project has with two of the groups of stakeholders in the triangle – the government (usually through specific government departments / agencies) and external stakeholders (e.g. industry, small businesses, NGOs or community groups such as fishers or small-scale farmers). In particular, our focus is on the extent to which there are linkages with an 'implementation agency', (i.e. an external body which takes up the knowledge and/or its products generated or applied through research or training). Thirdly, articulation takes into account linkages generated through sources of funding in two respects: whether the project/centre obtains funding from one or more of the three stakeholder groups (government, an external funder or the university itself); and, the extent to which the project/centre develops a relationship with its funders over time. This latter aspect is determined through the nature of the financial sustainability of the project.

The second dimension focuses on the extent to which development activities serve to strengthen the academic core of the university. This was operationalised in terms of the extent to which the work undertaken in projects/centres feeds into teaching or curriculum development; is linked to the formal training of students; enables academics to publish in academic publications (journals, books etc); is linked to international academic networks; and, generates new knowledge (versus applying existing knowledge).

These various aspects relating to articulation and strengthening the academic core were converted into indicators which could then be applied to an analysis of the development-related projects and centres included in the study. On the basis of the indicator ratings, the projects/centres were plotted on a graph depicting the intersection between articulation and strengthening the academic core.

In this section, we present the analysis of the connectedness of selected development-related activities at UoN. These projects, which have an economic development or poverty reduction focus, were identified by the institutional leadership for inclusion in the study.

It should be noted that this method of analysis is a work-in-progress and in the context of this study has two possible limitations. The first is that the method of

analysis has been developed since completion of the data collection which means that there are some areas of the project data which were not explored in great detail during the interviews. We have, as far as possible, attempted to obtain this additional data from project leaders in the drafting of this report. A second limitation is that the analysis which follows is based on a small number of projects rather than a large representative sample. In addition, the projects selected have an in-built bias since they were selected by institutional leadership on the basis of their economic development or poverty reduction focus. Despite these limitations, however, we believe that the analysis that follows is an illuminating first step towards the development of a tool which can enable institutions and donors to think critically and strategically about the implications of different models of funding and engagement or development-related activities.

5.3.1   A brief overview of the projects

African Collaborative Centre for Earth System Science (ACCESS)	
Location	Department of Geology, College of Biological and Physical Sciences, Chiromo Campus
Project leader	Prof. Eric Odada (Regional Director)
Timeframe	1989; ongoing
Type	Long-term research and capacity building programme
Web site	http://access.uonbi.ac.ke

This programme started about 30 years ago following an international meeting of the World Meteorological Organisation during which issues relating to the eroding of the ozone layer were discussed. As a geologist, Prof. Odada was already working in a field related to changes to the earth system over time. A group of scientists under the International Council for Science (ICSU) got together to plan an International Geosphere-Biosphere Programme which would study the changes taking place on the planet and the likely effects on the biological community. At that time, Prof. Odada was the only scientist from Africa in the organisation. He drew attention to the link between issues around climate change and other issues in the developing world such as land transformation (deforestation, erosion etc), the water cycle, biodiversity, health, food security and poverty, and highlighted the need to look at these issues in an integrated manner. This broad scientific agenda was accepted by the international community and then further expanded to include issues relating to atmospheric science and hydrological aspects, all of which became the agenda of the World Climate Research Programme. Prof. Odada contributed further to this agenda by arguing that Africa should be a central component of scientific investigation into the global issue of climate change given the pivotal role of the heating of the tropics in driving climate changes in other parts of the world. As a result, Africa became a central part of the development of the Global and Environmental Change Science Agenda. The final aspect of this global programme to be motivated by Prof. Odada was the introduction of a capacity-building component for African scientists.

The broad aim of the programme is to foster global change research on climate change to impact on water resources, food security, health and ecosystems. This research programme is intimately linked into global and African networks of organisations and programmes relating to the multidisciplinary area of global environmental change research and capacity-building. Over the years, Prof. Odada and colleagues have undertaken a number of research projects under the broad umbrella of global environmental change. Two recent research topics include: the contribution of biomass burning and atmospheric fallout on the waters in equatorial Africa; and adapting capacity to support climate change adaptation in Africa. Although based in the Department of Geology in the university, Prof. Odada frequently works in multidisciplinary teams including natural scientists, social scientists and economists.

The programme emphasises the importance of linking with target communities (intended beneficiaries) when undertaking research or technology development that is intended for these communities. They also pilot new technologies or techniques on a small-scale in the communities.

With regard to the capacity building focus of the programme, the focus is on addressing issues such as: How do educational institutions work to address issues of development and science in their own environments? How do we utilise available capacity? With regard to the latter, Prof. Odada noted that there are many unemployed PhDs or PhDs who are not working in their specific areas of training. In addition, there is a need to define the capacity needs of institutions like universities and governments. There is also the need to look at the science-policy interface: on the one hand, the capacity of scientists to talk in a language that is understandable to policy-makers and rural communities; on the other hand, the capacity of policy-makers to assimilate research findings into decision-making.

Regional cooperation in Africa around global environmental change research was taken to a new level at a workshop held in Nairobi in September 2005 which focused on moving towards the establishment of an African Global Environmental Change Research Network. Participants included global change scientists, the ICSU family, international organisations, development aid agencies, research councils and foundations, regional networking organisations, science academies and governmental and non-governmental agencies. The workshop identified scientific priorities for a new structure taking into account the need to improve and expand scientific understanding of earth system processes of special importance in and to the region, especially those related directly to: the needs of the countries of the region, the various sub-regions, the scientific priorities of existing regional bodies and to the global priorities of the relevant international global change research programmes. The key research themes suggested by the workshop, which are driven by multidisciplinary research questions, included water and climate modelling, desertification, land degradation, biodiversity and food security, health and pollution, and aquatic ecosystems.

Funding for the programme from government comes via research grants from the National Council on Science and Technology and via small grants from the

Deans' Committee in the university (which is government-funded). Other funders include the African Development Bank, World Bank, DFID, IDRC, and the Arab Fund (through the United Nations Department of Economic and Social Affairs).

Chronic Poverty Research Centre in Kenya (CPRC-K)	
Location	Institute for Development Studies
Unit head	Prof. Njuguna Ng'ethe
Timeframe	2003; ongoing
Type	Long-term research programme
Web site	--

The Chronic Poverty Research Centre in Kenya (CPRC-K) is a research network of academic and policy analysis institutions and NGOs led by the Institute for Development Studies at UoN. CPRC-K is a sub-centre of the Chronic Poverty Research Centre based at the Institute for Development Policy and Management at the University of Manchester. The UK centre is a partnership of 'northern' and 'southern' research institutes and advocacy organisations that seek to provide analysis and policy guidance that will stimulate national and international debate and action about achieving greater inclusion of the chronic poor in the formulation of, and benefits deriving from, development policy.

The CPRC-K was established at the Institute for Development Studies out of the quest to understand the relationship between government policy and levels of poverty, on the one hand, and the dynamics of poverty in general, and of chronic poverty in particular, on the other hand. The activities of the centre are determined first and foremost by academic discourse and institutional research interests (e.g. the debates about poverty); then by national development concerns, especially with regard to research priorities; and, lastly, by donor interests.

The objectives of the centre include the following:

- To carry out research on chronic poverty in Kenya using both qualitative and quantitative methods;
- To strengthen the capacity of government and research organisations to undertake further research on chronic poverty;
- To develop and propose workable strategies to support the reduction of chronic poverty in Kenya;
- To disseminate research findings and other information related to chronic poverty to policy-makers, civil society, development practitioners, the private sector, donors, and the general public; and
- To foster policy dialogue around the problems associated with chronic poverty and the ways in which these might be reduced.

CPRC-K is a five-year programme with three distinct but complementary activities: research, capacity building, and dissemination and communication. The goal is to provide information that can clearly aid in the development of interventions that benefit the chronically poor by seeking answers to the

following questions: what pushes individuals and households into chronic poverty (drivers), what traps them there (maintainers) and what may enable them to leave (interrupters)? A number of research projects have been undertaken under this programme including, for example, an overview of the poverty situation in Kenya, and specific poverty-related issues in Kenya.

Another element of the programme is fellowships and scholarships. Three to four fellowships are awarded each year, which enable those who want to do their research in the area of chronic poverty to undertake their fieldwork. Two scholarships are granted each year via the Board of Postgraduate Studies. These students are registered in the Institute for Development Studies.

The Centre is funded by DFID and Trócaire (Ireland).

African Clothing and Footwear Research Network (ACFRN)	
Location	Institute for Development Studies, College of Humanities and Social Sciences
Project leader	Prof. Dorothy McCormick (International Coordinator)
Timeframe	2001; ongoing
Type	Long-term research programme
Web site	http://acfrn.org/home.php

The idea for the Network was the outcome of a workshop in 1999 in the United Kingdom. The UoN Institute for Development Studies invited academics from Tanzania, Ethiopia and South Africa to form a network. The network was launched in Nairobi in September 2001 with initial support from the government of the Netherlands. Madagascar and Mauritius were included at a later date. The Network is governed by a secretariat based at the Institute for Development Studies, by country coordinators, a steering committee and resource persons.

The overall purpose of the Network is to generate and disseminate information about the clothing and footwear industries in Africa that will be useful for industry, policy and academic purposes.

The activities of the network unfolded in two phases (linked to funding). The first phase involved undertaking a review of what research had already been done on the clothing and footwear industry in the initial four countries and beyond, which would form the basis of future research. In addition, team members made contact with the relevant ministries in each country (such as a ministry of industry) to find out what policies were already in place and which were still needed, and to set up a network of linkages with governments. The network also approached some industry players (manufacturers and associations). The idea is for both policy-makers and industry players to shape the network's activities. The Kenya Steering Committee, for example, comprises two firms, the Kenya Association of Manufacturers, a small-scale textile entrepreneur, and two officials from the Ministry of Industrialisation.

The second round of funding enabled the network to begin to undertake studies of its own into both small- and larger-scale enterprises. At the time of

the interview, the network was in the process of applying to the IDRC for a third round of funding. The application was approved in principle and put into the 'pipeline' for funding, but because of IDRC budget cutbacks, a final decision had not yet been made.[9]

In addition to the research, the Kenya team ran a couple of strategic planning workshops for about 40 small-scale clothing and footwear manufacturers at the start of the project on how to develop business plans and run their businesses.

There is also a capacity-building component to the network's activities, including hands-on training for country coordinators; the inclusion of novice researchers in the research teams (including one PhD student whose research is in the clothing industry field); and, scholarship support to six masters students in the network member countries.

The network is almost entirely funded by external agencies. Initial funding was from the government of the Netherlands. Additional funding was secured from the IDRC and the British Council's DelPHE (Development Partnerships in Higher Education) programme. The DelPHE funding is specifically for developing linkages between higher education institutions in the United Kingdom and beyond, with a focus on the fight against global poverty. The DelPHE funding enabled Network members to undertake collaborative research and to visit each other's institutions.

Child Labour Project	
Location	Institute for Development Studies, College of Humanities and Social Sciences
Project coordinator	Mr John Njoka
Timeframe	September 2006 – December 2008
Type	Consultancy research project
Web site	--

Mr. Njoka had undertaken a consultancy for the International Labour Organisation (ILO) during which he had observed that there was a serious need for knowledge to support the action programmes in the ILO because they were supporting the Ministry of Labour and civil society organisations to take action leading to the elimination of child labour. The ILO invited Mr. Njoka to submit a proposal for research into the issue of child labour, the results of which would feed into their activities and planning. The proposal was submitted in 2005.

The aims of the Child Labour Project were threefold:

- To improve the capacity at the Institute for Development Studies for understanding/learning, appreciating and researching child labour issues by both students and staff;

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[9] Since the interview, the IDRC has awarded the network a research grant to undertake a two-year study which would have started in April 2010.

- To enhance policy dialogue and debate among staff, students and stakeholders for assessing and analysing efforts and practices for withdrawing children from child labour and its worst forms; and
- To strengthen the knowledge base and intellectual linkages between efforts aimed at prevention and withdrawal, on the one hand, and critically related issues (such as gender, children participation, vocational training, HIV/Aids and wealth creation), on the other hand, with a view to mainstreaming child labour in those policy areas.

The project involved research on different aspects of child labour including education, micro- and small-scale enterprises, poverty education, commercial sex exploitation of children, vocational training and policy responses to these issues as they affect child labour elimination.

The project was funded by the ILO's International Programme on the Elimination of Child Labour.

Applied Training Project (ATP) of the Nile Basin Initiative	
Location	Hydrometrology and Surface Water Resources Unit, Department of Meteorology
Project leader	Prof. Francis Mutua (National Coordinator)
Timeframe	2004-2010
Type	Capacity building project
Web site	http://www5.uonbi.ac.ke/projects/nile/

According to the web site, the Nile Basin Initiative is a partnership initiated and led by the riparian states of the Nile River through the Council of Ministers of Water Affairs of the Nile Basin states. The countries in the initiative include Burundi, the Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Launched in February 1999, the Initiative provides an institutional mechanism, a shared vision, and a set of agreed policy guidelines to provide a basin-wide framework for cooperative action.

The initiative has two main components of capacity development in integrated water resources management, namely, the Nile Basin Research Programme and the Applied Training Project.

According to the web site, the Applied Training Project supports the Shared Vision Program's vision to improve water planning and management cooperatively in the basin by assisting in the development of human resources and institutional capacity building through:

- Strengthening capacity in selected subject areas of integrated water resources planning and management within the region in the medium term;
- Strengthening centres with the capacity to develop and deliver training programs in Integrated Water Resources Management; and
- Expanding the frequency and scope of basin interchange among water professionals involved in capacity building activities.

A key aspect of the project is to develop capacity through masters and PhD training, as well as amongst government officials involved in activities which affect the river (e.g. water resources). A related aspect of the project is to create awareness amongst water users (e.g. farmers). With regard to postgraduate training, curricula were developed in each country according to their strengths (e.g. irrigation in Egypt, power generation in Tanzania, climate and water in Kenya). Masters and PhD students are sent for training to the country which holds the relevant expertise.

For the government, the project runs one-week appreciation courses for government chief executive officers. The focus of these courses is to shift attitudes about water management through information sharing. The need for a shift in attitudes was identified in an earlier research project. At the time of the interview, about 20 of these courses for the ministries had been completed.

The project team has also worked with poor communities, providing training in things such as flood management. The team has also shared knowledge and information about generating income through agricultural activities since most of the people in the area are fisher people and were suffering because of the dwindling fish resources in the river.

The Applied Training Project is funded by the Netherlands. Other donors fund aspects of interest to them. The United Nations Office for Project Services established a project management unit in Cairo to centralise/unify all the country operations.

Street Vendors and Traders Project	
Location	Institute for Development Studies, College of Humanities and Social Sciences
Project leader	Prof. Winnie Mitullah
Timeframe	2000; ongoing
Type	Participatory action research project
Web site	--

Prof. Mitullah's academic background is in political science and public administration and her early research interests focused on urban development and, in particular, low-income housing. Prof. Mitullah then began to ask questions about how people actually survive in the 'slums' and this led to an interest and research in informal trade and street vending, during the 1980s. In 2000, she decided to conduct a participatory research project on street traders. In the process of conceptualising the project, she linked up with a range of organisations and activists including the IDRC (Ottawa and Nairobi), DFID, WIEGO (Women in Informal Employment, Globalising and Organising) based at Harvard University, and StreetNet International. At the time, StreetNet International was proposing a similar study and so Prof. Mitullah "piggybacked onto the proposal" and the search for funding.

The initial aim of the project at the Institute for Development Studies level was to avail information relevant for planning and understanding the activities of street vendors and informal traders in Kenya. The Institute project had a bias

towards female street vendors but, during a participatory dissemination process, the vendors argued that vending had many men and a project could not be dedicated to women only. This resulted in a second proposal that was aimed at facilitating street vendors and informal traders across both sexes.

The first phase of the project (2000-2003) comprised a programme of research and dialogue amongst female street traders in Kenya. The key research questions related to the socio-economic status of these women, and their ability to organise and effectively lobby municipal authorities. The research team conducted a survey of female street vendors, exploring their level of organisation; documented and analysed policies and regulations affecting them; worked with NGOs and the female vendors themselves to identify their information needs; and facilitated information exchange on the status of female street vendors between NGOs, policy-makers and the vendors themselves.

During the finalisation of the study, the research team disseminated the preliminary findings to the street traders. They highlighted a key finding that the biggest challenge facing the street traders was not lack of credit, but rather their lack of organisation as a group or sector. This led to requests for help on how to go about getting organised. Prof. Mitullah decided to help facilitate the organisation of the street traders and so wrote a funding proposal, entitled *Facilitation of Street and Informal Traders in Kenya*, again in collaboration with organisations such as StreetNet, WIEGO and DFID. A small grant from StreetNet International made it possible to get the facilitation process going. In the beginning, the facilitation was done by Prof. Mitullah on her own as part of her 'community service' work at the university. Over time, with additional funds, it was possible to employ some additional help. Finally, linking up with the Unitarian Universalist Service Committee enabled Prof. Mitullah to hand over the reins and play a more supporting role. The street vendors are now organised into urban alliances in seven towns in Kenya under the umbrella of KENASVIT. The organisation has an office in Nakuru manned by a full-time coordinator and an office assistant.

The project is funded by the IDRC, DFID, StreetNet International, and the Unitarian Universalist Service Committee.

Disaster and Risk Management Project	
Location	Department of Meteorology, School of Physical Sciences
Project leader	Prof. John Muthama (Project Coordinator)
Timeframe	January – June 2006
Type	Short-term consultancy project
Web site	--

Prof. Muthama responded to a call for proposals advertised in the newspaper by the Ministry of State and Special Programmes for a consultancy team to undertake a research project to assist in the development of a Disaster Risk Reduction Strategy for Kenya. Prof. Muthama and colleagues were selected from about 40 applicants to undertake the work.

The aim of the project was to develop a Disaster Risk Reduction Strategy for Kenya with a specific focus on preventative measures and resilient behaviour in disaster management. Prof. Muthama led a multidisciplinary team from the UoN, including staff from the Departments of Meteorology, Sociology, Civil Engineering and Geology. Part of the project included conducting a baseline survey with target communities to find out what challenges they faced in times of natural disasters.

The strategy developed by the project team, which has been implemented by government, focuses on two key elements of disaster management, namely, preventative measures and early warning systems. This strategy is seen to have important implications for poverty alleviation since it helps poor communities to become more resilient to disasters which can often have devastating effects on their livelihoods.

The project was funded by the Ministry of State and Special Programmes.

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The key features of these development-related projects/groups are summarised in Table 5.1 over page.

The projects/centres have been categorised according to type and include longer-term research-based programmes, capacity building initiatives and consultancy projects. The economic development focus of five of the seven projects/centres is on the generation of research information to provide a foundation of understanding for further action in relation to poverty reduction or economic development initiatives. Two involve capacity building of key stakeholders and one was the development of a strategy for policy-makers that would have implications for people living in poverty.

As might be expected, the consultancy projects were initiated and the agenda set by the external agencies that funded the projects, whereas the longer-term research programmes were, for the most part, initiated by the academics themselves. It also appears that the long-term research programmes had the widest range of external linkages while the short-term consultancy project reported none.

Table 5.1: Overview of the development-related projects

Project/centre	Classification	Funder(s)	Beneficiaries	External linkages	Initiation/ agenda-setting	Economic development focus
African Collaborative Centre for Earth System Science	Long-term research and capacity building programme	Government agency, the university, foreign donors	African science and policy communities, NGOs and local communities	International research organisations, networks and NGOs	University academic, international academic network	Research and capacity building around environmental issues that are linked to poverty
Chronic Poverty Research Centre	Long-term research programme	Foreign donors	Policy-makers, civil society, development practitioners, the private sector, donors, the general public	Local and international research centres, government agencies	University academics, national development needs, donors	Research information on the causes and strategies for reduction of poverty to key stakeholders
African Clothing and Footwear Research Network	Long-term research programme and business support	Foreign donors	Policy-makers, civil society, development partners, donor community, local community	Small and large producers, government, business and NGOs in participating countries, academics in other universities	University academics, country steering committees, foreign donors	Research information on the needs of small- and large-scale producers to key stakeholders, and some business support
Child Labour Project	Consultancy research project	Foreign donor	Organisations working towards the elimination of child labour, university students and faculty, government agencies, donor	Other university and NGOs in Kenya	Foreign donor	Research information to inform the planning and activities of an international organisation involved in eliminating child labour

Table 5.1: Overview of the development-related projects (continued)

Project/centre	Classification	Funder(s)	Beneficiaries	External linkages	Initiation/ agenda-setting	Economic development focus
Applied Training Project	Capacity building project	Foreign donor	People dependent on and responsible for water resources from the Nile Basin in Kenya	Poor communities	The Nile Basin Initiative participants	Building the capacity of people responsible for the Nile water resources in Kenya
Street Vendors and Traders Project	Participatory action research project	Foreign donors, international NGO	Street vendors and informal traders in Kenya	International NGOs	University academic, international NGOs, street vendors	Research information on the needs of female street vendors as well as support in organising themselves as a sector
Disaster and Risk Management Project	Short-term consultancy	Government agency	Ministry of State and Special Programmes	None reported	Government agency	Development of a Disaster Risk Reduction Strategy for Kenya which has important implications for people living in poverty

5.3.2   Articulation

Table 5.2 below summarises interviewee's responses to the question about the extent to which the project or centre aims and objectives were in response to / articulated with the university's strategic objectives (as contained in the institution's strategic plan), as well as the country's national development priorities. Methodologically, we do recognise that project leaders might have drawn these links more strongly in retrospect than originally was the case in order to give the impression of greater articulation. A deeper exploration of the circumstances of the initiation and agenda-setting of the project would have enabled us to see these linkages more clearly ourselves. Nevertheless, the reported linkages are sufficient for a first-level analysis.

As can be seen from Table 5.2, only two of the projects reported articulation of project aims to institutional strategic objectives, and only in broad terms. Counter-intuitively, these two projects were initiated by external stakeholders. Most of the projects were able to identify national priorities to which their objectives were linked and, in some cases, in very specific terms.

Table 5.3 indicates the extent to which each project or centre had linkages with an external agency that has or will directly or indirectly 'implement' (or utilise) the outputs. Table 5.4 summarises the comments made by project leaders about the financial sustainability of the projects. Finally, Table 5.5 summarises the total articulation ratings for the six projects/centres.

Table 5.2: Articulation with institutional objectives and national priorities

Project/centre	Funder(s)	Initiation/ agenda-setting	Institutional strategic objectives	National priorities
African Collaborative Centre for Earth System Science	Government agency, the university, foreign donors	University academic, international academic network	None reported	The projects articulate national, regional and pan-African plans and agendas (e.g. MDGs, NEPAD) on issues such as food security, water and climate change.
Chronic Poverty Research Centre	Foreign donors	University academics, national development needs, donors	None reported	Reducing poverty is one of the key focus areas of the social pillar of *Kenya Vision 2030.*
African Clothing and Footwear Research Network	Foreign donors	University academics, country steering committees, foreign donors	Promoting excellence through export diversification and linkages between industrial growth and realisation of *Vision 2030*.	Promoting industrial growth, creating employment, and poverty reduction.
Child Labour Project	Foreign donor	Foreign donor	Very broadly, in terms of addressing development concerns, of which child labour is one.	Child labour as a key human resource issue is well articulated as a barrier to national growth and development in the *Vision 2030* and the medium-term development plan.
Applied Training Project	Foreign donor	The Nile Basin Initiative participants	None reported	The aim to contribute to alleviating poverty articulates one of the priorities of the national development plan.
Street Vendors and Traders Project	Foreign donors, international NGO	University academic, international NGOs, street vendors	None reported	Project articulates emphasis in national development plan on supporting the informal economy, as well as Kenya's Private Sector Development Strategy (goal 5: support entrepreneurship and indigenous enterprise development).
Disaster and Risk Management Project	Government agency	Government agency	The strategic plan targets involvement of staff in national development priorities through consultancies and community service.	The project was a response to the need for the development of a Disaster Risk Reduction Strategy for Kenya for the period (2006-2016).

Table 5.3: Initiation/agenda-setting, funding sources and implementation agencies

Project/centre	Initiation/agenda-setting	Funder(s)	Implementation agencies
African Collaborative Centre for Earth System Science	University academic, international academic network	Government agency, the university, foreign donors	The programme maintains linkages with various relevant government ministries with a view to future implementation but there is no direct link to a specific implementation agency.
Chronic Poverty Research Centre	University academics, national development needs, donors	Foreign donors	The centre works closely with the Ministry of Planning which uses the centre's data and survey methods, and their personnel are trained in issues relating to poverty.
African Clothing and Footwear Research Network	University academics, country steering committees, foreign donors	Foreign donors	Although the network does maintain close linkages with small- and large-scale producers and relevant government agencies through the course of its projects, no direct link to a specific implementation agency was reported.
Child Labour Project	Foreign donor	Foreign donor	Research findings fed directly to the ILO which can be seen as an implementation agency. In addition, the Ministry of Labour revised its National Plan of Action on Child Labour in line with the research findings.
Applied Training Project	The Nile Basin Initiative participants	Foreign donor	In addition to masters and PhD training, the project builds capacity of water users and government officials responsible for water management and, in this sense, have a direct link to implementation agencies.
Street Vendors and Traders Project	University academic, international NGOs, street vendors	Foreign donors, international NGO	The project works directly, in a participatory way, with the female street vendors, and in collaboration with organisations that deal directly with street vendors.
Disaster and Risk Management Project	Government agency	Government Agency	The Ministry of State and Special Programmes

Table 5.4: Financial sustainability of the projects/centres

Project/centre	Classification	Timeframe	Funder(s)	Financial sustainability
African Collaborative Centre for Earth System Science	Long-term research and capacity building programme	1989; ongoing	Government agency, the university, foreign donors	The programme has a wide variety of funding sources and has exhibited a great capacity for attracting funds for over thirty years. In terms of sustainability, Prof. Odada anticipates that some of his first-class PhD graduates will continue his work once he retires. Over 50 PhD and 150 MSc graduates have been trained and are now part of the network in their respective countries and institutions.
Chronic Poverty Research Centre	Long-term research programme	2003; ongoing	Foreign donors	Although the Centre depends entirely on external sources for its funding, the unit head expressed confidence in the Centre being able to attract continued funding over the long-term.
African Clothing and Footwear Research Network	Long-term research programme and business support	2001; ongoing	Foreign donors	Future financial sustainability of the Network is an issue. At the time of the interview, there was still no confirmation of whether they would get a third round of funding from the IDRC since their budget had been slashed by 50% because of the global economic crisis. The project leader foresees the need to search for multiple sources of funding in order to keep the Network going.
Child Labour Project	Consultancy research project	September 2006 – December 2008	Foreign donor	This was a once-off consultancy project. However, the project leader noted that the project has generated interest in child labour issues at the university and that postgraduate courses on child labour issues have been introduced.
Applied Training Project	Capacity building project	2004-2010	Foreign donor	Through the project, the Nile Basin Universities Forum was established. This forum, when fully operational, is expected to sustain most of the activities of the project. However, no specific plans for financial sustainability were reported.
Street Vendors and Traders Project	Participatory action research project	2000; ongoing	Foreign donors, international NGO	The street vendors are now organised into urban alliances. Part of the financial sustainability comes from the payment of annual subscriptions to the alliances and through a revolving loan fund which was kick-started with funds leveraged by the project. The funds generated in this way will be used to support the urban alliances and the secretariat.
Disaster and Risk Management Project	Short-term consultancy	January-June 2006	Government agency	Once-off consultancy project

Table 5.5: Articulation rating (maximum score = 13)

Project/centre	African Collaborative Centre for Earth System Science	Chronic Poverty Research Centre	African Clothing and Footwear Research Network	Child Labour Project	Applied Training Project	Street Vendors and Traders Project	Disaster and Risk Management Project
Institutional objectives	0	0	1	1	0	0	1
National priorities	1	2	1	1	2	2	1
No. of funding sources	3	1	1	1	1	2	1
Funding sustainability	3	2	2	1	2	3	1
Implementation agency	1	2	1	2	2	2	2
Total articulation rating	8	7	6	6	7	9	6

Key:

Institutional objectives / National priorities:
2 = Direct (link to specific strategic objective or national priority)
1 = Indirect (broad/general reference)
0 = None (no reported link)

No. of funding sources:
1 for each of the following: University; Government; Foreign donor; Income generation

Funding sustainability:
1 = Once-off, short-term (a project that is one year or less in duration and which receives only one round of funding)
2 = Long-term but capped (a project that is more than one year in duration and which receives one or more rounds of funding, but the funding is capped)
3 = Ongoing (a project which receives ongoing funding, e.g. from the university or from income generation)

Link to implementation agency:
2 = Direct
1 = Indirect
0 = None

5.3.3 Contribution to strengthening the academic core

Table 5.6 below summarises the information pertaining to each of the projects with regard to their connection to the academic core activities of the university. 'Core strengthening' activities include the generation of new knowledge; the involvement of students in the project as part of their formal training; project knowledge and experience feeds into teaching and curriculum development; project knowledge and experience is published in academic publications; and the project is linked to international academic networks. In order to rate the extent to which the projects contribute to strengthening the academic core, each of the five factors highlighted above were assigned a value of 1 when present. The results are captured in Table 5.7.

Interestingly, both the long-term research programmes and the consultancy projects generate new knowledge. In fact, compared to the consultancy projects encountered in other universities in the HERANA sample, the consultancy projects reviewed here make a fairly significant contribution to strengthening, and not weakening, the academic core.

Table 5.6: Contribution to strengthening the academic core

Project/centre	Classification	New/existing knowledge	Link to academic core			Link to international academic networks
			Student involvement	Teaching/curriculum	Publishing	
African Collaborative Centre for Earth System Science	Long-term research and capacity building programme	Generate new and apply existing knowledge	A number of masters and PhD students have focused on research topics linked to the programme over the years.	The project has resulted into two new programmes: on Integrated Water Resource Management, and on Climate Change Adaptation.	Numerous books and journal articles over the years	Yes
Chronic Poverty Research Centre	Long-term research programme	Generate new knowledge	One student has completed her masters project paper based on chronic poverty.	The Institute relies heavily on its research findings for teaching/curriculum development.	No peer-reviewed articles or books	Yes
African Clothing and Footwear Research Network	Long-term research programme and business support	Generate new and apply existing knowledge	Yes, masters and (one) PhD students have focused their research on topics relating to the Network's research.	Yes, the project leader teaches on the Masters in Development Studies programme and project knowledge also feeds into other courses.	Two books and one journal article	Yes
Child Labour Project	Consultancy research project	Generate new knowledge	Five masters students participated in the project but not as part of their formal training.	Course on child labour has been introduced for graduate students.	A book	No

Project/centre	Classification	New/existing knowledge	Link to academic core			Link to international academic networks
			Student involvement	Teaching/curriculum	Publishing	
Applied Training Project	Capacity building project	Apply existing knowledge	Thus far, nine masters and one PhD student have focused their research on topics linked to the Nile Basin Initiative.	The project itself involved the development of a postgraduate curriculum. Also undergraduate course on Hazard and Disaster Management developed.	Not yet	Yes
Street Vendors and Traders Project	Participatory action research project	Generate new and apply existing knowledge	One masters students did their thesis on a topic linked to the project. Other students assisted with data collection but not as part of their formal training.	Yes, although in a somewhat ad hoc fashion.	Two books	No
Disaster and Risk Management Project	Short-term consultancy	Generate new knowledge	Students were involved in collecting data, as well as data analysis and report-writing. For most, this was part of their formal training.	Yes	No	No

Table 5.7: Strengthening academic core rating

Project/centre	Teaching / curriculum development	Formal training of students	Generate new knowledge	Academic publications	Link to international academic networks	Total rating
African Collaborative Centre for Earth System Science	1	1	1	1	1	5
Chronic Poverty Research Centre	1	1	1	0	1	4
African Clothing and Footwear Research Network	1	1	1	1	1	5
Child Labour Project	1	1	1	1	0	4
Applied Training Project	1	1	0	0	1	3
Street Vendors and Traders Project	1	1	1	1	0	4
Disaster and Risk Management Project	1	1	1	0	0	3

Key:

1 = Yes
0 = No

5.3.4   Analysis of the connectedness of development projects/centres

In order to analyse the development projects identified for the study, we operationalised the notion of 'connectedness' along two axes – the first, articulation, refers to the extent to which there is some coherence between the development projects/centres and the objectives and priorities of government and the institution, as well as linkages between the project and key external stakeholders, and especially implementation agencies. The second axis considers the extent to which the development projects/centres serve to strengthen or weaken the academic core of the institution.

The total ratings for each project in terms of its articulation and contribution to strengthening the academic core of the university are summarised in Table 5.8 below. Using these ratings, each of the projects is then plotted on the articulation and academic core axes in Figure 5.1.

Table 5.8: Summary of ratings

Project/centre	Articulation	Academic core
African Collaborative Centre for Earth System Science	8	5
Chronic Poverty Research Centre	7	4
African Clothing and Footwear Research Network	6	5
Child Labour Project	6	4
Applied Training Project	7	3
Street Vendors and Traders Project	9	4
Disaster and Risk Management Project	6	3

Figure 5.1: Plotting the development-related projects

Key:

ACCESS	African Collaborative Centre for Earth System Science
CPRC	Chronic Poverty Research Centre
ACFRN	African Clothing and Footwear Research Network
CLP	Child Labour Project
ATP	Applied Training Project
SVTP	Street Vendors and Traders Project
DRMP	Disaster and Risk Management Project

Following the analytical proposition, our assumption would be that for development-related projects to make the most sustained contribution to development they would best fall within the top right-hand quadrant in the graph; in other words, their activities articulate with national priorities and institutional strategic objectives; they have close linkages with key external stakeholders, especially any implementation agencies; and they contribute towards strengthening the academic core of the institution, rather than weakening it.

As can be seen from Figure 5.1, three of the projects fall squarely in the top right quadrant which implies that they are able to make a sustainable contribution to development. All three are long-term research programmes, two of which reported numerous external linkages, and two of which had more than one funding source and long-term or ongoing funding sources. All three also scored well in terms of strengthening the academic core.

On the whole, however, the projects did not score very well on the articulation rating. Five of the seven reported no articulation of project aims to institutional strategic objectives and only three had direct articulation with specific national policies or strategies. Five of the seven projects only had one source of funding (usually foreign donors).

Part 6

Key findings

AT A GLANCE

- Macro-observations about higher education and economic development in Kenya
- The nature of the pact around the role of higher education in Kenya
- The strength of the UoN's academic core
- The connectedness of the university's development-related activities to the academic core

6.1 Introduction

A vast amount of data has been gathered and presented in the preceding sections of this report. But what does this tell us about the possible contribution that higher education in Kenya can make to the country's economic development? In order to answer this broader question, we return to the key concepts and questions which were summarised in section 1.1.3. Here, our point of departure was that higher education's role in and contribution to economic development can best be understood by investigating the following three interrelated factors:

- The nature of the pact between the universities, political authorities and society at large;
- The nature, size and continuity of the university's academic core; and
- The level of coordination, the effectiveness of implementation, and connectedness in the larger policy context of universities.

Furthermore, these factors need to be considered in relation to various contextual features including local circumstances, institutional characteristics and external relations.

By way of concluding this report, we review and analyse the data presented in order to answer the following questions:

1. How does Kenya fare on the preconditions for an effective and productive relationship between higher education and economic development identified in the international case studies (see Pillay 2010b)?

2. To what extent is there a pact between key stakeholders (national and institutional) in Kenya about the role of higher education in general, and in relation to economic development in particular?

3. Does the UoN, as a specific case, have capacity to make a contribution to economic development in terms of:
   a. The nature and strength of the academic core, and
   b. The connectedness of its development-related activities to the academic core?

6.2 Some macro-observations about higher education and economic development in Kenya

Pundy Pillay's investigation of three systems (Finland, South Korea, North Carolina) suggested a number of 'preconditions' for an effective and productive relationship between higher education and economic development (Pillay 2010). These were summarised in section 1.1.2.

How does Kenya fare in meeting these preconditions?

- **High quality schooling**. Participation rates are relatively low at both the primary and secondary levels. The net enrolment ratio in primary education increased significantly from 63% in 1999 to 75% in 2006, but still leaves the country far short of achieving universal primary education. The secondary schooling participation rates compare favourably with most African countries. In 2006, the GER in secondary schooling was 50% and the net enrolment ratio was 42% (UNESCO 2009). The corresponding averages for sub-Saharan Africa were 32% and 25%, and for developing countries 60% and 53%, respectively. Both the GCI and GII reports comment favourably on the quality of Kenyan schooling. The survival rate to the last grade of primary schooling was 84% in 2006 (the average for sub-Saharan Africa was 67%, and that for developing countries 81%). Moreover, the average rate of repetition in primary schooling was a low 6% (ibid.).

- **Effective economic and education planning**. There is acknowledgment of the link between education and economic development but little effort has been made to put in place the appropriate policies and necessary institutional mechanisms in government to effect a closer coordination of education and economic policies.

- **The role of the state**. The state plays an important role with respect to funding, as well as encouraging private sector provision of higher education. The state's policy documents give prominence to the role of tertiary education in development and to the role of science and technology as well.

- **Partnerships**. In general, no evidence could be gleaned of partnerships between the state, the universities and the private sector.

- **Institutional differentiation**. Substantial differentiation occurs in the higher education system with the presence of universities, university colleges,

polytechnics, teacher training colleges and other colleges. Within the university sector, less differentiation occurs with all institutions aspiring to becoming teaching and research institutions, with significant duplication of high-cost faculties such as medicine.

- **Quality**. Pockets of good to high quality exist in the higher education sector, especially with respect to the UoN. However, quality needs to become a much more widespread feature of the higher education system.

- **Funding**. State funding of tertiary education is low in absolute terms given the extent of need and the imperative to increase access and enhance equity.

- **Innovation.** Kenya is ranked relatively high in the GII, especially in terms of its 'innovation inputs'. It therefore has the basic ingredients for innovation and participation in the knowledge economy but appears to be incapable thus far of translating this into appropriate inputs. However, there are two encouraging features with respect to innovation and prospects for the knowledge economy. The first is the merging of higher education and science and technology into one ministry. The second is the policy proposals that have been developed to define the role of science and technology in economic development.

6.3   Evidence of a pact around the role of higher education in Kenya?

For the purposes of this study, we use the definition of a pact provided by Gornitzka *et al.* (2007: 184):

> *A 'pact' is a fairly long-term cultural commitment to and from the University, as an institution with its own foundational rules of appropriate practices, causal and normative beliefs, and resources, yet validated by the political and social system in which the University is embedded. A pact, then, is different from a contract based on continuous strategic calculation of expected value by public authorities, organised external groups, university employees, and students – all regularly monitoring and assessing the University on the basis of its usefulness for their self-interest, and acting accordingly.*

The key actors of the pact are national, institutional and external stakeholders. It is assumed that the stronger the pact between universities, university leadership, national authorities and society at large, the better the universities will be able to make a significant, sustained contribution to development.

Our interest is in exploring the extent to which there is a pact around the role for higher education in economic development in Kenya. Key to the development of such a pact is agreement or consensus that there should be a

role and then about what that role should entail. In order to investigate this aspect, we have sought to address the following questions:

- Is there a role for knowledge production and for universities in the national development plan?
- How do the relevant national authorities and institutional stakeholders talk about and conceptualise the role of universities?

The role of knowledge and universities in national and institutional policies and plans were operationalised into a series of indicators. These indicators were then rated on a 3-2-1 scale by three of the researchers. The indicators and the ratings (indicated by shading) are presented in Table 6.1 below.

Table 6.1: Role for knowledge and universities in development in Kenya

National Rating = 6/6			
The concept of a knowledge economy features in the national development plan	3 Strong Appears in a number of policies	2 Weak Only mentioned in one policy	1 Absent Not mentioned at all
A role for higher education in development in national policies and plans	3 Prevalent Clearly mentioned in development policies	2 Weak	1 Absent
Institutional (UoN) Rating = 4/6			
Concept of a knowledge economy features in institutional policies and plans	3 Features strongly in strategic plan and/or research policy/strategy	2 Vague reference in strategic plan or research policy	1 Not mentioned at all
Institutional policies with regard to the university's role in economic development	3 Institutional policy	2 Embedded in strategic plan, research policy etc	1 No formal policies

At the national level, Kenya is certainly moving in the direction of a knowledge-driven economy through important initiatives such as *Kenya Vision 2030,* as well as the establishment of a Ministry of Higher Education, Science and Technology – a move which recognises the critical role played by R&D in accelerating economic development in newly-industrialising countries. *Vision 2030* also argues for creating globally competitive and adaptive human resources based on quality education, training and research. However, there is limited evidence that this vision is broadly accepted and, as was pointed out by a respondent, there is no specific role outlined for universities. Also, the ministry responsible for higher education has only spots of capacity to steer the system, funding allocation is only somewhat predictable, and there are no particular incentives to steer the system in the direction of the new vision. One strength is a differentiated system with multiple sources of funding. Despite the fact that policy coordination is in the President's Office – an approach tried and failed in

South Africa – coordination of policy across departments, and between government and universities, is at most intermittent.

At the university level, reference is made in the current strategic plan to the knowledge economy and to the university's role in economic development, but these references are weaker than in the previous strategic plan. The current strategic plan refers to teaching and learning as the core business of the university, while innovation and R&D are described as issues the university must address. Despite a number of senior institutional leaders saying in different ways that research is the principal activity that distinguishes the university from tertiary institutions, both government and institutional support for research is, in the words of a number of respondents, negligible. Furthermore, neither the National Council for Science and Technology nor the Commission for Higher Education have, as yet, played much of a role in raising significant research funding. Rather surprising is that despite the policy commitment to high-level skills training and labour market relevance, programmes linking academics and students to the labour market are mostly ad hoc and not institutionalised.

➡ **FINDINGS:**

- In certain government departments there is a strong emphasis on the knowledge economy. However, despite *Vision 2030*, there is a lack of clarity and agreement (pact) about a development model and the role of higher education in development.
- There is no broad agreement that knowledge, and by implication higher education, is key to development.
- The reorganisation of the ministry shows an emerging awareness about the importance of the knowledge economy approach, perhaps more so at government than at university level.

6.3.1 Notions of the role of knowledge and universities in development

How do national and institutional stakeholders conceptualise the role of higher education and the university in development? And, to what extent is there consensus or disjuncture between the national and institutional levels? Our conceptual framework for addressing these questions comprises four notions of the relationship between higher education (especially universities) and national development. These four notions[10], which are elaborated upon below, emerge in the interaction between the following two sets of scenarios:

- Whether or not a role is foreseen for new knowledge in the national development strategy, and

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[10] These four notions are based on ideas developed by Maassen and Cloete (2006) and Maassen and Olsen (2007).

- Whether or not universities, as knowledge institutions, have a role in the national development strategy.

These two sets of scenarios, and the concomitant four notions of the role of universities, are depicted in Figure 6.1 below:

Figure 6.1: The four notions of the role of knowledge and universities in development
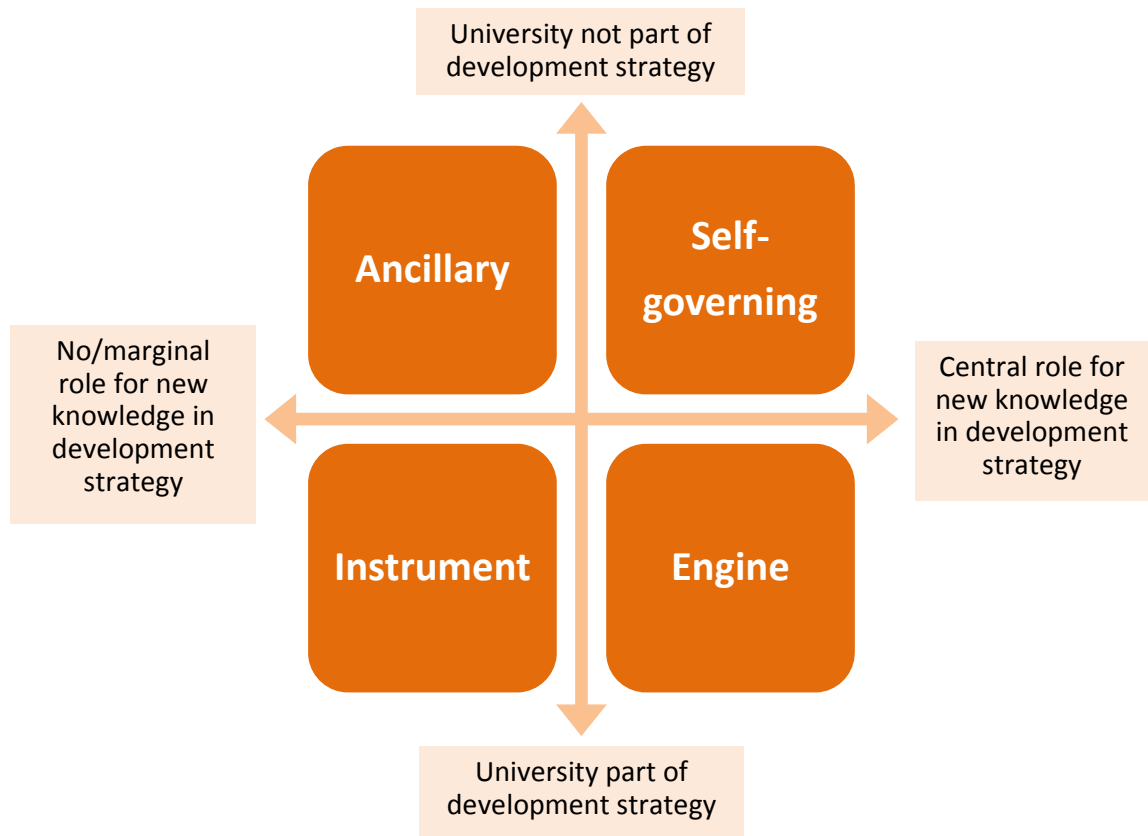
The four notions are elaborated as follows:

- **The university as ancillary:** In this notion, there is a strong focus on political/ideological starting-points for development. Consequently, it is assumed that there is no need for a strong (scientific) knowledge basis for development strategies and policies. Neither is it necessary for the university to play a direct role in development since the emphasis is on investments in basic healthcare, agricultural production and primary education. The role of universities is to produce educated civil servants and professionals (with teaching based on transmitting established knowledge rather than on research), as well as different forms of community service.

- **The university as self-governing institution:** Knowledge produced at the university is considered important for national development – especially for the

improvement of healthcare and the strengthening of agricultural production. However, this notion assumes that the most relevant knowledge is produced when academics from the 'north' and the 'south' cooperate in externally-funded projects, rather than being steered by the state. This notion portrays the university as playing an important role in developing the national identity, and in producing high-level bureaucrats and scientific knowledge – but not directly related to national development; the university is committed to serving society as a whole rather than specific stakeholders. This notion assumes that the university is most effective when it is left to itself, and can determine its own priorities according to universal criteria, independent of the particularities of a specific geographical, national, cultural or religious context. It also assumes there is no need to invest additional public funds to increase the relevance of the university.

- **The university as instrument for development agendas:** In this notion, the university has an important role to play in national development – not through the production of new scientific knowledge, but through expertise exchange and capacity building. The focus of the university's development efforts should be on contributing to reducing poverty and disease, to improving agricultural production, and to support small business development – primarily through consultancy activities (especially for government agencies and development aid) and through direct involvement in local communities.

- **The university as engine of development:** This notion assumes that knowledge plays a central role in national development – in relation to improving healthcare and agricultural production, but also in relation to innovations in the private sector, especially in areas such as information and communication technology, biotechnology and engineering. Within this notion the university is seen as (one of) the core institutions in the national development model. The underlying assumption is that the university is the only institution in society that can provide an adequate foundation for the complexities of the emerging knowledge economy when it comes to producing the relevant skills and competencies of the employees in all major sectors, as well as to the production of use-oriented knowledge.

Table 6.2 below summarises the notions of the role of higher education held by national and institutional stakeholders, and indicates whether the notion is strong, prevalent, present or absent altogether. While there is widespread support for the notion of higher education contributing to development, there is neither in the national *Vision 2030* nor in the university's strategic plan, a clear vision or notion as to how this is to happen. Interestingly, it seems that while the government has moved towards more policy emphasis on research and innovation, the university has somewhat moved away from it. The dominant positions seem to be between making a more direct **instrumentalist** contribution to community and industry development, and the more traditional **self-governance** approach, but with the emphasis on teaching and learning, not

on R&D. For both government and university, the engine of development model is still largely symbolic policy.

Table 6.2: Comparing national and institutional notions of the role of higher education in Kenya

Notions	National stakeholders		Institutional stakeholders	
Ancillary	•	Strong feeling that university must be involved	•	Broadly supportive for contributing to *Vision 2030*
Self-governing	☐	University important for development, but not clear on the role	◼	Oscillate between teaching-learning and consultancy and research
Instrument for development agendas	☐	Expectation that university should make a more direct contribution to social and health problems	◼	Still a strong belief amongst academics
Engine for development	◼	Strongly reflected in future vision, but not in reallocation of resources	☐	Strong on rhetoric, but seem to be vacillating

Key:

◼ Strong   ☐ Prevalent   • Present

➡ **FINDINGS:**

- In terms of notions of the role of the university in development, at the national level there is quite a strong leaning towards the engine of development approach, combined with a more direct instrumental approach, while at the university there is a more traditional divide between instrumental and self-governance.
- At neither the national nor the institutional level is there agreement about the role of the university in development. It is quite surprising that amongst university leadership there is such low support for a knowledge economy approach.

6.4   The academic core of the University of Nairobi

The university's unique contribution to development is via knowledge – either transmitting knowledge to individuals who will go out into the world and contribute to society in a variety of ways (teaching), or producing and disseminating knowledge that can be applied to the problems of society and economy (research, engagement). Part of our conceptual framework for understanding what impacts on a university's ability to make a sustainable contribution to development therefore focuses on the nature and strength of its knowledge activities.

According to Burton Clark (1998), when an enterprising university evolves a stronger steering core and develops an outreach structure, its heartland is still in the traditional academic departments, formed around disciplines and some interdisciplinary fields. The heartland is where traditional academic values and activities such as teaching, research and training of the next generation of academics occur. Instead of 'heartland', we use the concept 'academic core'. According to our analytical assumption, it is this core that needs to be strengthened if flagship universities – such as those included in this study – as key knowledge institutions, is to contribute to development.

While most universities also engage in knowledge activities in the area of community service or outreach, our contention is that the backbone or the foundation of the university's business is its academic core – that is, its teaching via academic degree programmes, its research output, and the production of doctorates (those individuals who, in the future, will be responsible for carrying out the core knowledge activities). Furthermore, in societies where there is a strong pact between higher education and society, the universities have been able (and allowed) to develop a strong core of academic activities that forms the basis for all their activities.

Our interest in the academic core of the UoN has the following two dimensions:

1. What is the strength of the academic core of the institution?
2. Has the academic core been strengthening or weakening in recent years?

In Part 4 of this report, we presented a detailed profile and analysis of the nature and strength of the UoN academic core. The analysis was undertaken on the basis of seven key indicators (see Table 6.3 below). The rating of the UoN indicators was undertaken on the basis of a cluster analysis which included South Africa's 22 contact universities and the seven other African universities included in the study.

Table 6.3: University of Nairobi: Rating of the academic core

	Indicator	Strong (3)	Medium (2)	Weak (1)
1	Science, engineering and technology enrolments and graduations			SET students = 31% in 2007, but output poor: Only 50% of SET intakes expected to graduate
2	Postgraduate / undergraduate enrolments ratio Masters / PhD enrolment ratio			Proportion of postgraduates fell from 20% in 2001 to 16% in 2007. Ratio of masters to doctoral enrolments very high at 21:1
3	Teaching load: Academic staff / student ratio	Overall ratio 18:1 in 2007, and 9:1 in SET		
4	Proportion of academic staff with doctorates	71% of a permanent academic have doctorates		
5	Research income per permanent academic staff member			Detailed information not given, assumed to be inadequate
6	Doctoral graduates			Graduates in 2007 constituted 2.5% of permanent academics
7	Research publications			Outputs in 2007 is 0.11 of publications per permanent academic

The following observations can be made about the academic core data for UoN:

1. **SET enrolments** – UoN's SET enrolments grew from 7 600 in 2001 to 12 300 in 2007, at an average annual rate of 8.4%. UoN's proportion of SET students dropped from 33% in 2001 to 31% in 2007. UoN's SET graduation rate, taking account of the full period 2001-2007, has been poor. Only 50% of students entering SET programmes in UoN can be expected to complete their qualifications.

2. **Postgraduate enrolments** – UoN's proportion of postgraduate students in its total enrolment fell from 20% in 2001 to 16% in 2007, mainly because of the rapid growth in undergraduate enrolments. Masters enrolments grew from 3 937 in 2001 to 6 145 in 2007, an average annual increase of 10.4%. Doctoral enrolments however fell from 190 in 2001 to only 62 in 2007. This implies that UoN's increased total masters graduates are not moving into doctoral studies.

3. **Teaching load** – Between 2001 and 2007, UoN's FTE academic staff total grew at an average annual growth rate of 1%, while FTE students increased at an average annual rate of nearly 8%. Its average FTE student to FTE academic staff ratio, as a consequence, rose from 12:1 in 2001 to 18:1 in 2007. Its SET ratio remained nevertheless remained favourable by South African standards, being only 9:1 in 2007. Its business/management ratio, as is the case with many other

universities, was unacceptably high at 42:1 in 2007. A conclusion which can be drawn is the UoN's permanent academics in the fields of SET must, in 2007, have had teaching loads at levels which should have enabled them to engage in research activities, including the supervision of research students.

4. **Qualifications of staff** – In 2007, more than 900 (or 71%) of UoN's permanent academic staff had doctorates as their highest formal qualifications. This proportion of 71% is well above the highest reported by South African universities.

5. **Research funding** – UoN did not provide clear information on research funding. On the assumptions made in the analyses, its research funding might not be sufficient to sustain strong research activities.

6. **Doctoral graduates** – There was an increase in doctoral graduates of 3.5% between 2001 and 2007, but from a rather low base of 26, which results in the very low ratio of 2.5% of doctoral graduates to permanent academic staff. The doctoral enrolments decreased from 190 in 2001 to 62 in 2007 – a rather dramatic drop which will surely affect future graduate outputs.

7. **Research publications** – In terms of research publications, UoN's output is low. Its 2007 ratio of publication units per permanent academic was, at 0.11, well below the ratio of 0.50 which has been set as a target for South Africa's research universities.

In terms of input variables, UoN has teaching loads, particularly in SET, which should enable its academic staff to support research activities. It also has a substantial total of more than 900 academic staff with doctorates and fast-growing masters-level enrolments. UoN's output performance, despite these advantages in its inputs, has been poor. Graduation rates in SET are low. The throughflow from masters to doctorate is very low and the production of doctoral graduates and research articles has also been low. The key factors that seem to be weakening the academic core are (a) the inefficient outputs of SET graduates, (b) the low proportions of postgraduate students, and in particular doctoral students, (c) the low output of doctoral graduates, and (d) the poor output of research publications. A positive development is that UoN is experiencing a growth in masters enrolments, and graduates from these programmes could prove to be important inputs for future research programmes. However, this would require that the conditions for throughflow are improved.

The factors that appear to be weakening the academic core include an incentive system that does not reward knowledge production, and low research income combined with attractive consultancies and additional income-generating teaching opportunities.

➡ **FINDINGS:**

- The knowledge production output variables of the academic core do not seem strong enough to enable UoN to make a sustainable contribution to development.
- The university is not significantly changing from a predominantly undergraduate teaching institution, with a strength in SET and business studies.
- On the input side, UoN scores strong on masters and doctoral enrolments (despite the decline in the latter), staff teaching load and particularly staff qualifications (the highest in the sample).
- The university scores weak on all three output variables, despite a strong showing on the input side.
- The most serious challenges to strengthening the academic core seem to be to increase research funding, doctoral graduation rates and research outputs.

6.5 Coordination and connectedness

Knowledge policies have become increasingly important in the context of the knowledge economy. Broadly speaking, knowledge policies refer to political mechanisms (such as policies and incentives) that are aimed at improving the (knowledge) capacity of a country to participate in the global knowledge economy. Such policies thus relate to the higher education and science and technology sectors, and to high-level skills training, research and innovation. The coordination of knowledge policies can take place at the level of both policy formulation and policy implementation.

In this project 'coordination' is used to refer to more structured forms of interaction, mainly between government and institutions; in other words, the knowledge policies and implementation activities of different government departments, particularly departments of education, science and technology, and research councils. Of specific interest to this study is the coordination of knowledge policies across ministries involved with higher education, science, technology and innovation, as well as those responsible for economic development or planning.

Implementation can be regarded as a component of the coordination of government policies and is a complex combination of agreement (relevant parties support the policy) and capacity to design and apply the implementation mechanisms or instruments. At the national level we looked at the role of the ministry responsible for higher education, steering and funding. At the institutional level, indicators dealt with aspects such as units or structures to implement strategic plans, incentives and rewards, special teaching and research programmes that link to economic development and funding support for research.

Another key issue for the relationship between higher education and economic development is to establish a *productive* relationship between knowledge and

connectedness. On the one hand, if there is an overemphasis on the basic knowledge activities of teaching and research – in other words, an excessive inward orientation towards strengthening the academic core – this results in the university becoming an 'ivory tower'. Or, if the academic core is weak, an overemphasis on knowledge results in the 'ancillary' role of the university (i.e. no direct role in development). On the other hand, if there is an overemphasis in the university on connecting to development activities, then it weakens the academic core and the university has little new or relevant knowledge to offer in the exchange relationship. The challenge for universities, then, is to deal with this inherent tension between 'buffering' (protecting) the core technologies of the institution, and 'bridging' (linking) those with external actors (Scott 2001: 199-211).

For the purposes of this study, we are using the term 'connectedness' to refer to the relationship (and tension) between the inward focus on strengthening and maintaining the academic core, and the outward focus on linking with external stakeholders and development.

In this section, we address the following three questions relating to coordination and connectedness:

- Does government coordinate policies and steering mechanisms that enable the university to contribute to development?
- Does the university connect to external groupings in ways that promote development?
- Do development activities in the university strengthen or weaken the academic core?

6.5.1 Knowledge policy coordination and implementation

Table 6.4: National coordination of knowledge policies

National Rating = 6/9			
Economic development and higher education planning are linked	3 Systematic Formal structures Headed by senior minister	2 Sporadic Clusters / forums	1 Weak Occasional meetings
Link between universities and national authorities	3 Specific coordination structures or agencies	2 Some formal structures but no meaningful coordination	1 No structures, and political rather than professional networks
Coordination and consensus building of government agencies involved in higher education	3 Higher education mainstreamed across government departments	2 Intermittent interaction with ineffective forums	1 Higher education issues limited mainly to one ministry or directorate

➡ **FINDINGS:**

- At the national level, there are considerable coordination activities, including clusters and the reorganisation of the national ministry.
- While there are personal networks between government officials and particular university leaders, it is not clear whether this contributes towards strengthening the institution or the sector.

By far the largest proportion of research funding in the institution comes from foreign donors. A senior academic commented that in recent years there had been major changes, particularly amongst the American donor agencies such as USAID and Rockefeller, which are no longer funding research in the universities directly, but rather through civil society organisations. According to this respondent, this is leading to fragmentation and projectisation since funding is provided for numerous small, short-term projects rather than for longer-term research programmes.

There was no evidence of specific incentives or rewards to encourage development-related activities. However, the previous UoN strategic plan (2005-2010) makes reference to the intention to establish rewards (criteria for promotion) for consultancy activities, although it is not clear whether these have been realised. And, while consultancy has been mainstreamed, there do not appear to be any concrete mechanisms in place for incentivising or rewarding development-related activities.

Table 6.5: Implementation of knowledge policies and activities

National Rating = 8/12			
Role of the ministry responsible for higher education	3 Organised ministry with capacity to make predictable allocations	2 Spots of capacity with some steering instruments	1 Weak capacity with unpredictable allocations
Implementation to 'steer' higher education towards development	3 Strong Instruments such as funding / special projects that incentivise institutions/individuals	2 Weak Occasional grants for special projects	1 Absent No particular incentive funding
Balance / ratio of sources of income for institutions	3 Government, fees and third stream	2 Mainly government plus student fees	1 Mainly government with external funders
Funding consistency	3 A stable, transparent public funding mechanism based on criteria agreed upon by all actors involved	2 Funding allocations somewhat predictable but do not allow for long-term planning nor reward enterprising behaviour	1 No clear funding or incentives from government

Institutional (UoN) Rating = 8/18			
Specific units, funding or appointments linked economic development	3 Specific units, funding or appointments	2 Economic development initiatives aspect of a unit or appointment	1 Mainly ad hoc, staff-initiated operations
Incentives and rewards for development-related activities	3 Incentives / counts towards promotion	2 Some signals but largely rhetoric	1 No mention
Teaching programmes linked to the labour market	3 Targets for enrolments in fields considered to be of high economic relevance	2 Some programmes in response to specific industry requests	1 No new programmes linked to labour market
Special programmes linking students to economic development	3 Entrepreneurship, work-based learning and/or incubators for students mainstreamed	2 Ad hoc programmes	1 No special programmes
Research activities are becoming more economy-oriented	3 Research policy/strategy has an economic development focus	2 Some research agendas have an economic development focus	1 Ad hoc project funding
Levels of government and institutional funding for research	3 High	2 Medium	1 Low

➡ **FINDINGS:**

- One of the weaknesses is implementation, both at national and university levels.
- While the university does have development-related structures and special programmes linking it to development initiatives, the problem is that in too many cases these initiatives are driven by individuals rather than being institutionalised. In addition, these special implementation efforts need to be more connected.
- Despite policies that extol the importance of research related to development activities, research related to development is not rewarded through incentives beyond the traditional academic promotion system.

6.5.2 Connectedness to external stakeholders and the academic core

While there appear to be some significant linkages between government agencies and the university at the level of individual units and projects, the relationship between the university and government at the broader level seems to have gone through some difficult times, and there are mixed views about this. On the one hand, according to one institutional leader, the university is

usually the first choice for government when assistance is needed with policy development; many UoN academics were involved in the development of *Kenya Vision 2030* – from economics, sociology, political science and administration, amongst others. However, some respondents were quite sceptical about how the university is perceived by the government, claiming that academics are often accused of being too theoretical and not practical enough.

A number of respondents felt that there is still quite a residue of mistrust between the government and university, which is not always discussed openly, but which is certainly present. While academics do get co-opted into expert functions in certain policy areas, there is a sense that the 'knowledge industry' (of which the university is a central part) is not going to be allowed to drive the development process in the country. Mistrust also plays itself out in the traditional autonomy tension where the university is subject to the State Corporations Act, which tends to be more restrictive than facilitative. There is a process underway to seek greater autonomy and strengthen the university's ability to determine its own direction and operations.
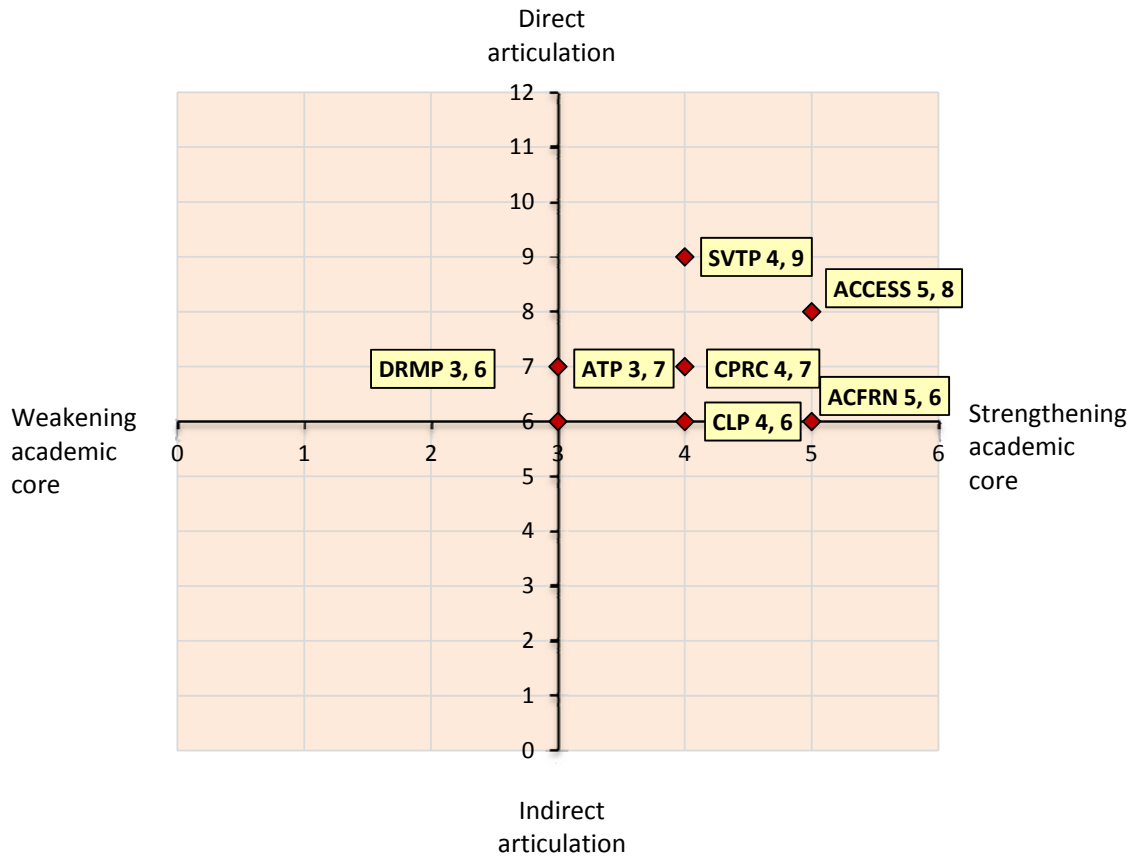
There were hardly any examples of linkages with the private sector or industry. The previous strategic plan refers to a study undertaken for the Commission for Higher Education which confirmed that relatively low collaboration exists between universities and industries in Kenya in relation to teaching and learning, as well as R&D initiatives.

A considerable number of consultancy activities are undertaken in the university and consultancy has been mainstreamed as a core function of the university. The University of Nairobi Enterprises and Services (UNES) Ltd was established in 1996, and has now been expanded, with the aim of promoting and coordinating the various income-generating activities of the university, including teaching, research and consultancy activities. UNES is registered as a private company, limited by shares, and operates as a separate legal entity, independent of the university.

Until recently, research activities in the university have gone largely uncoordinated. In particular, there was no institution-level unit responsible for coordinating research and much of the research that was done for outside organisations (e.g. government or donors) was negotiated by individuals within academic units. A positive development is that recently the Deans' Committee – essentially the university's research committee – established two research units (for the sciences and social sciences) which are now responsible for coordinating research activities in their respective disciplinary areas. There are now also plans to establish an office for a Deputy Vice Chancellor for Research and Development.

With regard to the connectedness of development-related activities to the academic core, the articulation and academic ratings applied to the six projects/centres (section 5.3) are presented again in Figure 6.2 below.

Figure 6.2: Plotting the development-related projects/centres at the University of Nairobi

Key:

ACCESS	African Collaborative Centre for Earth System Science
CPRC	Chronic Poverty Research Centre
ACFRN	African Clothing and Footwear Research Network
CLP	Child Labour Project
ATP	Applied Training Project
SVTP	Street Vendors and Traders Project
DRMP	Disaster and Risk Management Project

Following the analytical proposition, our assumption would be that for development-related projects to make the most sustained contribution to development they would best fall within the top right-hand quadrant in the graph; in other words, their activities articulate with national priorities and institutional strategic objectives; they have close linkages with key external stakeholders, especially any implementation agencies; and, they contribute towards strengthening the academic core of the institution, rather than weakening it.

As can be seen from Figure 6.2, three of the projects fall squarely in the top right quadrant which implies that they are able to make a sustainable

contribution to development. All three are long-term research programmes, two of which reported numerous external linkages, and two of which had more than one funding source and long-term or ongoing funding sources. All three also scored well in terms of strengthening the academic core.

On the whole, however, the projects did not score very well on the articulation rating. Five of the seven reported no articulation of project aims to institutional strategic objectives and only three had direct articulation with specific national policies or strategies. Five of the seven projects only had one source of funding (usually foreign donors).

➡ **FINDINGS:**

- While there is evidence of connectedness between the university and industry or the private sector, these linkages are mostly confined to the level of units or centres rather than institutional-level partnerships.
- Most of these projects/centres manage to keep a strong connection to the academic core of the university.
- There are 'exemplary' development projects/centers at UoN, the problem is scale: there are simply not enough, and some seem overly dependent on exceptional individuals.

6.6   Concluding comments

The *Kenya Vision 2030* is the new development blueprint covering the period 2008-2030. The main aim of the vision is to transform Kenya into a middle-income country. The anchors for this are macro-economic stability; governance reforms; enhanced equity and wealth creation; opportunities for the poor; infrastructure development; energy; and science, technology and innovation. This is supported by the Science, Technology and Innovation Bill (2009) whose point of departure is the promotion of research, science, technology and innovation for national socio-economic development.

Along with these promising developments are about a 6% GDP growth since 2007, a higher HDI than its neighbours, the third highest innovation capacity (after South Africa and Mauritius), and a relatively differentiated tertiary sector. While tertiary participation is still low, Kenya receives relatively good ratings for quality of education and on-the-job training. However, the overall competitiveness potential is being eroded by a weakening of the institutional environment (moved down to 117 from 100 the previous year), government inefficiency (ranked 101) and rising corruption (116).

This picture of positive growth and a globalising vision for future development is undermined by a weakening institutional environment, a lack of policy coordination and implementation, and apparently weak steering towards very positive ideals. The lack of buy-in is reflected in the lack of concordance on the

part of the university which, if not moving away from the knowledge economy vision, is certainly ambiguous about it and responding to it rather 'symbolically'. There is also still considerable mistrust from the side of the university and, as was asserted above, there is also not a strong, institutionalised interaction with business.

It is difficult not to conclude that despite a number of positives, and a very modern grand vision for the future, there is no pact about the importance and the role of the university in development. Without a pact, and in a weakening institutional environment, it is not possible to do the necessary coordination and make the necessary tradeoffs to redirect resources in order to implement the vision.

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Appendix 1: List of interviewees

University of Nairobi

- Mr Ben Waweru (Academic Registrar)
- Prof. IM Mbeche (Principal: College of Humanities and Social Sciences)
- Prof. EHN Njeru (Dean: Faculty of Arts)
- Prof. Edward K Mburugu (Associate Dean: Faculty of Arts)
- Prof. Patts Odira (Dean: School of Engineering)
- Prof. Madara Ogot (Managing Director: University of Nairobi Enterprises and Services)
- Prof. Eric O Odada (Programme Director: Pan African START Secretariat)
- Prof. Dorothy McCormick (Institute for Development Studies)
- Mr John Njoka (Institute for Development Studies)
- Prof. Winnie Mitullah (Institute for Development Studies)
- Prof. NJ Muthama (Department of Meteorology)
- Prof. Francis Mutua (Hydrometrology and Surface Water Resources Unit)
- Prof. Njuguna Ng'ethe (Chronic Poverty Research Centre)
- Prof. John H. Ndiritu (Dean: Faculty of Agriculture)
- Dr Wanjiru Gichuhi (Population Studies and Research Institute)
- Mr Samuel W. Kiiru (Institute for Development Studies)

National stakeholder

- Elizabeth Wafula (Senior Assistant Commission Secretary (Planning), Commission for Higher Education)

Appendix 2: Cluster analysis methodology and data

A K-means clustering analysis was applied for the identification of four statistically significant and distinct clusters. Averages for 2005 to 2007 were used for input variables as well as non-financial output variables. Financial data for 2007 were used. Original values for all variables were statistically scaled to make the data comparable and to ensure equal weighting for all variables.

The following input variables were used for the clustering analysis:

- % headcount enrolments in science, engineering and technology (% SET)
- % masters and doctoral headcount enrolments (% M & D students)
- Inverse of the student: academic/research staff FTE ratio (inverse of stud: staff FTE ratio)
- % of permanent academic/ research staff with a doctoral degree (% staff with PhD)
- % private income
- Total income per FTE student (purchasing power parity dollar thousands) (income per FTE)
- Academic staff costs per FTE academic (purchasing power parity dollar thousands) (staff cost per FTE).

The following output variables were used for the clustering analysis:

- Graduation rate (number of graduates in a given year/ enrolments in a given year x 100)
- Research outputs (doctoral graduates + research publications).

The data values are shown in Table A2.1 over page. Figure A2.1 lists the universities in the four clusters and plots the means for each cluster.

Table A2.1: Cluster analysis data table

| | INPUT INDICATORS | | | | | | | | OUTPUT INDICATORS | |
| | Averages for 2005-2007 | | | 2007 only | 2007 income | | | 2007 expenditure | Averages for 2005-2007 | |
Total 2007 head counts (thousands)	% SET	% M & D students	Student: staff FTE ratio	% Staff with PhD	% Private Income	Income per FTE(purchasing power parity dollar thousands)	Academic staff costs per FTE academic (purchasing power parity dollar thousands)	Graduation rate	Weighted research output per permanent academic
LARGE CONTACT										
Tshwane University of Technology	51	38%	3%	31	12%	16%	10.5	81.0	19%	0.27
University of Pretoria	49	38%	15%	18	38%	40%	24.8	92.8	24%	1.36
North West University	45	20%	8%	30	43%	37%	12.6	106.2	24%	1.17
University of Johannesburg	42	31%	5%	16	18%	27%	15.9	46.0	23%	0.94
University of Nairobi	39	30%	16%	16	71%	34%	9.9	58.7	16%	0.45
University of KwaZulu Natal	38	32%	14%	18	30%	37%	21.2	96.1	21%	1.07
Makerere University	34	31%	7%	18	31%	15%	5.9	48.7	26%	0.51
MEDIUM CONTACT										
Cape Peninsula University of Technology	29	48%	2%	26	11%	27%	15.3	98.1	22%	0.20
University of the Free State	25	29%	12%	17	49%	30%	18.2	73.6	21%	1.27
University of the Witwatersrand	25	48%	23%	11	45%	51%	39.7	96.7	21%	1.52
Walter Sisulu University	24	26%	1%	30	9%	5%	8.7	108.6	12%	0.05
Nelson Mandela Metropolitan University	24	30%	7%	29	34%	25%	18.4	120.1	23%	0.82
Stellenbosch University	23	41%	22%	16	61%	51%	36.4	90.9	25%	2.03
Durban University of Technology	23	48%	2%	28	7%	11%	12.4	108.9	20%	0.14
University of Cape Town	21	42%	18%	13	58%	42%	40.0	99.3	26%	2.13
University of Dar es Salaam	18	39%	10%	15	50%	16%	8.6	44.1	24%	0.40
University of Ghana	26	18%	6%	29	47%	15%	6.3	68.5	20%	0.53
SMALL CONTACT										
University of Limpopo	16	44%	11%	16	16%	19%	21.3	77.5	21%	0.31
Vaal University of Technology	16	48%	1%	31	12%	13%	11.4	81.5	15%	0.12
Eduardo Mondlane University	16	50%	3%	12	19%	14%	5.6	24.9	8%	0.03
University of Botswana	16	25%	23%	17	20%	10%	14.8	85.6	22%	0.27
University of the Western	15	31%	10%	19	43%	41%	22.3	84.0	20%	0.91

| | | INPUT INDICATORS | | | | | | OUTPUT INDICATORS | |
| | | Averages for 2005-2007 | | | 2007 only | 2007 income | | 2007 expenditure | Averages for 2005-2007 | |
	Total 2007 head counts (thousands)	% SET	% M & D students	Student: staff FTE ratio	% Staff with PhD	% Private Income	Income per FTE(purchasing power parity dollar thousands)	Academic staff costs per FTE academic (purchasing power parity dollar thousands)	Graduation rate	Weighted research output per permanent academic
Cape										
University of Venda	12	31%	3%	34	35%	14%	10.0	100.3	16%	0.24
Cape University of Technology	10	45%	3%	28	29%	14%	13.0	79.2	22%	0.32
Mangosothu University of Technology	10	59%	0%	44	5%	13%	10.6	140.9	17%	0.03
University of Zululand	9	16%	5%	32	38%	30%	15.9	95.9	21%	0.70
University of Fort Hare	9	18%	6%	21	19%	37%	15.6	94.2	20%	0.45
University of Mauritius	8	42%	15%	16	45%	6%	3.7	20.9	27%	0.94
Rhodes University	6	22%	14%	17	50%	29%	26.9	107.7	32%	1.65

Notes:

1. The calculation of purchasing power parity dollars (PPP$) is based on estimates contained in the World Bank's (2008) *World Development Indicators* report. Because these estimates are based on 2005 exchange rates, the following method was used for the 2007 calculations:
   * The indicator set gives for each country a ratio between the PPP conversion factor and the market exchange rate. For example, the South African ratio is given as 0.61, based on a market exchange rate of R6.4 per USD in 2005.
   * The 2007 calculations assume that the 2005 ratio will apply again. So the 2007 PPP conversion factor is taken to be 2005 ratio times 2007 market exchange rate. For example, the conversion factor for South Africa is calculated as 2005 ratio times 2007 exchange rate = 0.61 x 7.0 = 4.27.

2. The financial data for the following three universities were based on the following assumptions:
   * University of Nairobi: academic staff costs assumed to = 35% of total expenditure
   * Eduardo Mondlane University: academic staff costs assumed to = 35% of total expenditure
   * University of Dar es Salaam: (a) academic staff costs assumed to = 35% of total expenditure; (b) private income = donor income.
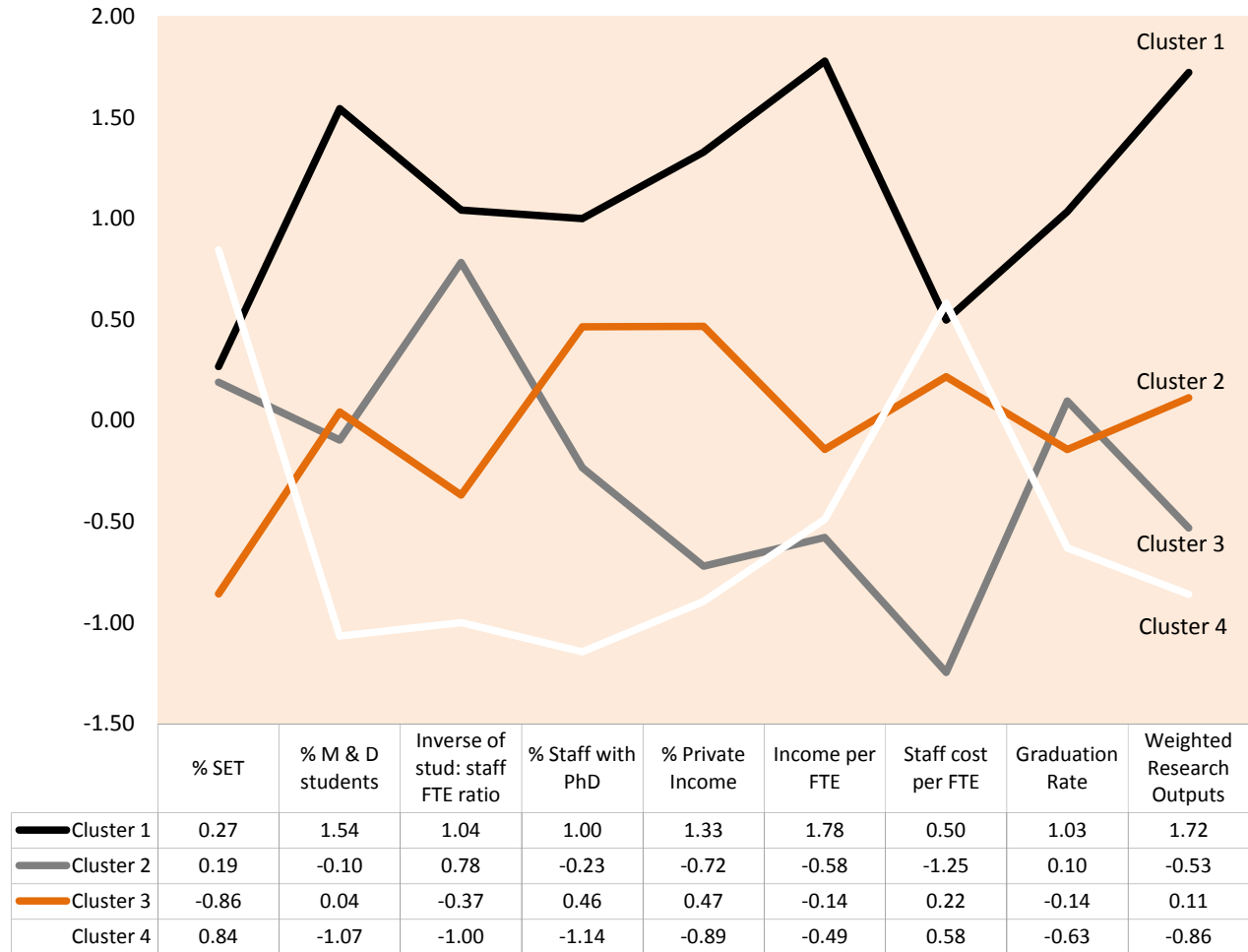
Figure A2.1: Plot of means for each cluster

Cluster 1
University of Pretoria, Witwatersrand University, Stellenbosch University, University of Cape Town, Rhodes University

Cluster 2
University of Johannesburg, Makerere University, University of Dar es Salaam, University of Limpopo, Eduardo Mondlane University, University of Botswana, University of Mauritius

Cluster 3
North West University, University of Nairobi, University of KwaZulu - Natal, University of the Free State, Nelson Mandela Metropolitan University, University of Ghana, University of the Western Cape, University of Venda, University of Zululand, University of Fort Hare

Cluster 4
Tshwane University of Technology, Cape Peninsula University of Technology, Walter Sisulu University, Durban University of Technology, Vaal University of Technology, Central University of Technology, Mangosothu University of Technology

	% SET	% M & D students	Inverse of stud: staff FTE ratio	% Staff with PhD	% Private Income	Income per FTE	Staff cost per FTE	Graduation Rate	Weighted Research Outputs
Cluster 1	0.27	1.54	1.04	1.00	1.33	1.78	0.50	1.03	1.72
Cluster 2	0.19	-0.10	0.78	-0.23	-0.72	-0.58	-1.25	0.10	-0.53
Cluster 3	-0.86	0.04	-0.37	0.46	0.47	-0.14	0.22	-0.14	0.11
Cluster 4	0.84	-1.07	-1.00	-1.14	-0.89	-0.49	0.58	-0.63	-0.86

Appendix 3: Academic core rating descriptions

Indicators		Strong (3)	Medium (2)	Weak (1)
1	**Strong science and technology**	SET enrolments growing, and SET share of enrolment shape increasing. Graduation rates of cohorts of SET students minimum of 70%.	SET share of enrolment shape steady. Graduation rate of cohorts of SET students 60% to 70%.	SET enrolments static, and SET share of enrolment shape declining. Graduation rate of cohorts of SET students below 60%.
2	**Increased postgraduate enrolments and outputs**	Postgraduates at least 25% of total enrolment. Masters and doctoral enrolments and graduates increasing. Ratio of masters to doctoral enrolments no more than 5:1. Ratio of graduates in year to enrolments in same year: masters 25%, doctorates 20%.	Postgraduates as proportion of total enrolments above 10% and increasing. Ratio of masters to doctoral enrolments no more than 10:1. Ratios of graduates to enrolments: masters 20%, doctorates 15%.	Postgraduate enrolments and graduates grow at average annual rate below that of undergraduates. Postgraduates 10% or less of total enrolment. Ratio of masters to doctoral enrolments above 10:1.
3	**Teaching loads of academic staff**	FTE academic staff ratio close to growth in FTE students. FTE student to academic staff ratios maximum of 15:1 for SET, and maximum average of 20:1 for: all programmes.	FTE students grow at faster rate than FTE academic staff. FTE student to academic staff ratios close 20:1 for SET, close to 30:1 for all programmes.	FTE students grow at faster rate than FTE academic staff ratio. FTE student to academic staff ratios more than 20:1 for SET, and 30:1 for all programmes.
4	**Qualifications of academic staff**	At least 50% of permanent academic staff have doctorates.	Between 30% and 50% of permanent academic staff have doctorates.	Less than 30% of permanent academic staff have doctorates.
5	**Availability of research funding**	Annual research funding of at least USD10 000 per permanent academic.	Annual research funding of between than USD 2 000 and USD 10 000 per permanent academic.	Annual research funding of less than USD 2 000 per permanent academic.
6	**Doctoral graduates**	Doctoral graduates in given year = 10% or higher of permanent academic staff.	Doctoral graduates in given year between 5% & 9.9% of permanent academic staff.	Doctoral graduates in given year < 5% of permanent academic staff.
7	**Research publications**	Ratio of 0.50 or higher of publication units per permanent academic.	Ratio of publication units per permanent academic between 0.25 and 0.49.	Ratio of publication units per permanent academic < 0.25.