Governance of higher education, research and innovation in Ghana, Kenya and Uganda

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# Table of Contents

**Executive summary** .......................................................................................................................... 5

**Chapter 1** ........................................................................................................................................... 6

*Overview of Higher Education in Africa*

Introduction ........................................................................................................................................... 8

**Chapter 2** .......................................................................................................................................... 11

*Internationalisation, Research, Innovations and Management in Africa's Higher Education: An Overview*

2.1 Introduction ........................................................................................................................................ 11

2.2 Higher Education in Africa: An overview ........................................................................................... 12

2.3 Knowledge deficits and research capacity gaps in African universities .............................................. 17

2.4 Science, technology and innovation ................................................................................................... 18

2.5 Partnerships for knowledge and development .................................................................................... 24

2.6 The changing landscape of Africa’s knowledge partnerships ............................................................... 25

2.7 Opportunities from internationalisation .............................................................................................. 34

2.8 Conclusions ....................................................................................................................................... 36

**Chapter 3** .......................................................................................................................................... 40

*Case study of Ghana*

3.1 Introduction ....................................................................................................................................... 40

3.2 Overview of the Economy of Ghana .................................................................................................. 41

3.3 The higher education system in Ghana .............................................................................................. 43

3.4 Research, knowledge production and innovation in Ghana ............................................................... 47

3.5 Role of Universities and Research Institutes in Innovation and National Development ................... 54

3.6 Promoting Research and Innovation in Ghanaian Universities ......................................................... 55

3.7 The role of internationalisation ........................................................................................................... 59

3.8 Future of research and innovation in Ghana Index ............................................................................ 62

**Chapter 4** .......................................................................................................................................... 67

*Case study of Kenya*

4.1 Introduction ....................................................................................................................................... 67

4.2 Trends and changes in policy and the roles of the university .............................................................. 68

4.3 The impacts of internationalisation ..................................................................................................... 98
4.4 National Policy Landscape.............................................................................................................. 100
4.5 Institutional implications of internationalisation ............................................................................... 103
4.6 Conclusion........................................................................................................................................ 107

Chapter 5 .............................................................................................................................................. 112

Case study of Uganda
5.1 Background to higher education in Uganda............................................................................. 112
5.2 Higher education governance and policy .................................................................................. 119
5.3 Policy framework for research and knowledge creation ......................................................... 120
5.4 Institutional environment for research and innovation .......................................................... 125
5.5 University linkages with business/industries ......................................................................... 127
5.6 Internationalisation and Higher Education in Uganda................................................................. 128
5.7 Conclusion........................................................................................................................................ 129
Executive summary

The OECD has carried out a study on Governance of higher education, research and innovation in Ghana, Kenya and Uganda as a part of the OECD programme on Higher Education and Research for Development (IHERD), which is financed by the Swedish International Development Cooperation Agency.

The report consists of an overview of the higher education landscape in Africa and three case studies on Ghana, Kenya and Uganda.

The case studies of Ghana, Kenya and Uganda show that:

- Recent development policy frameworks and program initiatives in the three countries demonstrate a clear focus on the interconnectedness between STI (science technology, and innovation) and development planning. However, the level of coherence within and among the existing policies, programs, and institutions still remains relatively weak. Policymakers require greater awareness and capacity building to ensure that national STI policies and programs capture the national development priorities and are internally and externally consistent in order to promote policy complementarily, coherence, and effectiveness.

- Notwithstanding the increasing mainstreaming of STI at the national development policy level, and despite the growing emphasis on the instrumentality of universities in promoting economic competitiveness and sustainable development, higher education institutions across the three countries remain poorly integrated into the emerging knowledge-based development paradigm and discourse. Higher education institutions still lack the required vision, resources, capacity, and leadership to embrace science technology and innovation as a guiding principle for their strategic planning and academic programs. The disjoint between national-level policies and institutional realities represent a devastating challenge to the realisation of knowledge-based economies in African countries. Senior leadership within universities and research institutions therefore require skills and capacity strengthening to be able to embed knowledge, enterprise, and innovation into their own strategic plans and research programs in order to discharge their mandate as catalysts of development;

- The three countries demonstrate impressive but varying levels of sophistication with respect to recent policy frameworks and governance arrangements for the management of their national research and innovation systems. Ghana and Kenya represent more elaborate and dynamic governance landscapes than Uganda; but all three countries clearly demonstrate an unmistakeable emphasis on developing more effective national institutional arrangements and policies to promote research governance and nurture knowledge economies. The key and most persistent weakness is the lack of national and institutional policies and programs that stimulate collaboration and knowledge exchange between research subsystems and the industrial and business subsystems.

- Inadequate and undiversified funding regimes remain a major challenge to the development of more vibrant research and innovation infrastructure in the three countries and across the sub-Saharan region. In the absence of private-sector funding and competitive grants, public
universities and research institutes in the Sub-Saharan region predominantly depend on dwindling public subsidies as well as unpredictable international donor support. This narrow funding base suggests that research and innovation systems in the three countries face severe financial deficits and lack the capacity to formulate and drive their own domestic research agendas. National policymakers and university leadership need to be encouraged to work in closer partnership and to prioritize the strategic importance of research and innovation in national economic growth and competitiveness by investing more significantly in strengthening research capacity, infrastructure, and research opportunities in universities.

- The three country case studies demonstrate that internationalisation, particularly through transnational and transdisciplinary partnerships among universities; represent one of the most effective options for strengthening research capacity and governance arrangements for research and innovation in sub-Saharan countries.

- The studies demonstrate the need for systematic and coherent approaches to integrating STI Policy into national economic and development strategy. This embedding process should accord particular emphasis on the coherent translation and cascading of national development goals and STI policies into clear action plans and intervention programs that are directly connected to promoting economic growth and improving people’s real livelihoods.
Chapter 1

James Otieno Jowi, African Network for Internationalisation of Education (ANIE)

Overview of higher education in Africa

Introduction

Universities in Africa have always been thought of in terms of their role in development. The idea of ‘development universities’ (Cloete et al., 2011) underlined the role of universities in development to meet the human resource needs of the economy. According to Varghese (2013) the state and public sector institutions were central to the development strategy of the newly independent countries in Africa. This model was replicated in education. Higher education was provided through public universities. The decades of 1960s and 1970s saw the establishment of new universities in African countries. Further, public universities in these countries also “symbolized national pride and self-respect” (Coleman and Court, 1993) and self reliance. Under this frame of analysis, the expansion of higher education served both political and economic aspirations of the newly independent governments. Hence, the governments were willing to allocate resources and invest in higher education.

Despite the weakening of the sector in the 1980s as a result of redirection of resources away from universities to primary education, the university sector managed to regain its central role in development at the dawn of the 21st century. Since then, the sector has expanded tremendously in the past few years in the number and diversity of institutions, student numbers, in the emergence of new actors and the consequences of global dynamics. In recent years, the higher education sector in Africa has attracted attention from stakeholders, both internal and external, often due to this recognition of the important role of higher education in Africa’s transformation (Bloom et al., 2005). However, Africa’s higher education still faces numerous challenges: funding, access, quality concerns, institutional capacities, weak research base and governance.

At the same time, several dramatic and even revolutionary changes have taken place in higher education globally (Altbach, Reisberg & Rumbley, 2010) also impacting on Africa’s higher education. Among the new developments is the growing impact of
internationalisation on higher education activities, policies and planning. Its diverse and unprecedented effects make it one of the major forces shaping Africa’s higher education in the 21st century (Jowi, 2010). Its consequences include opportunities, challenges and attendant risks which demand closer analysis and understanding.

That role of higher education in Africa’s sustainable social, political and economic development is not contestable. With few resources, inadequate capacity and a history of neglect, the sector has been struggling over the years to respond to increasing demands including capacity gaps. One of the main issues facing the sector is its research and innovation capacity and the ability to use these for the continent’s transformation. Some efforts have been made towards these. At the continental level, the African Union Second Decade of Education Action Plan has prioritised higher education as an area for Africa’s development, with an emphasis on knowledge generation through centres of excellence, quality assurance, harmonisation, regional integration, and resource mobilisation (AU, 2008).

The African Union Commission (AUC) views regional integration as a key and intermediate step towards integration of African countries into the global economy. This is also to bring convergence to Africa’s higher education system which is diversely structured along geographical, colonial, linguistic and structural lines. Lots of premium has been placed on research and quality of higher education. This is also reflected in the agenda of regional university organizations such as the Inter University Council for East Africa (IUCEA) and the Southern Africa Regional Universities Association (SARUA).

The implementation of the Pan African University (PAU) is a step towards the implementation of the Arusha Convention which aims at harmonization of academic programs across borders to achieve enhanced collaborations, quality assurance, structural convergence, compatibility, recognition and transferability of degrees to facilitate mobility (Hann & Teferra, 2012).

Amid all these, research has become a major issue, especially in Africa where academic research activity remains weak especially due to quality challenges, weak institutional capacities and inadequate funding, among others. Research outputs and knowledge
production are vital for Africa’s sustainable socio-economic development. This further presents the potential to support the pursuit of well-trained and skilled expertise in African universities and other core sectors in terms of Africa’s growth and development. This presents an urgent need for African universities to invest in research, innovation and in the development of the new generation of scholars, including improved quality of teaching and research.

This paper discusses the status of research and innovation in Africa. The focus is on three African countries i.e. Kenya, Uganda and Ghana. The paper focuses on the national context of each country, the policy environment and development in research and innovation at institutional levels. It finally discusses the role of internationalisation in promoting research and innovation in African countries. The paper is divided into five parts. The first part presents the introduction. The second part presents an overview of the African context while the third, fourth and fifth parts discuss the cases of Ghana, Kenya and Uganda. The final part of this report will be a synthesis of the foregoing parts.
2.1 Introduction
Higher education in Africa has a significant role to play in Africa’s development including the attainment of the Millennium Development Goals (MDGs). Over the years, African universities have responded to this role, including through research and innovations, but under several constraints. Through its varied activities, the international dimension of higher education in Africa is an important link in this endeavour. International agencies helped shape the development of higher education in Africa. UNESCO sponsored the first Africa-wide conference on higher education in Tananarive in 1962 which paved the way for the creation of the Association of African Universities. The heads of universities who participated in the Tananarive conference met in Khartoum to form AAU, which was formally inaugurated in Rabat, Morocco, in 1967 (Varghese, 2013).

The World Bank remained the single largest source of external funding for higher education in Africa (Habte, 1989). Many private foundations made substantial contributions to developing institutional capacity to carry out research and training in Africa. The Rockefeller Foundation concentrated its efforts in certain selected universities and also provided fellowships and grants for study abroad programmes, especially for the Master’s and doctoral level, appointed visiting staff, and provided research grants to promote local research (World Bank, 1988). The Carnegie Corporation, the Kellogg Foundation, and the Ford Foundation, etc., were other notable private agencies.

This chapter provides an overview to research, innovations and management in Africa. This is discussed at policy and institutional levels. The paper further discusses the contributions
of the internationalisation of higher education in Africa to research and innovation in Africa. The chapter builds on the growing importance of research, innovation and internationalisation of higher education in Africa, and its potentials and possibilities for Africa’s development. The paper recognises the diversity of Africa, including significant differences in higher education across the continent. The intent of this chapter is therefore to provide a background and context useful for understanding the succeeding chapters.

2.2 Higher Education in Africa: An overview

Africa faces several development challenges which have perennially threatened the socio-economic wellbeing of its people and stifled different facets of growth. Africa’s quest is to overcome these bottlenecks and take advantage of opportunities for enhanced development. These challenges have been summarised within the Millennium Development Goals (MDGs). According to the Africa Progress Report (2012), there has been encouraging progress towards the attainment of the MDGs, with gains recorded in education, child survival, and the fights against killer diseases such as HIV/AIDS and malaria. However, overall progress remains too slow and uneven, with many Africans still trapped in poverty and marginalisation, while too few benefit from the continent’s growth trend. At the same time, the levels of inequality across much of Africa remain profound and unjustified.

With expansion of the knowledge economy, the knowledge produced by the higher education system and the skills possessed by its graduates are becoming deciding factors in promoting economic progress and social welfare. Research evidence indicates that knowledge has been the single-most important engine of growth and the driving force of economic performance in OECD countries over the past decades (UIS/OECD, 2003). Therefore, it is recognized now, more than ever before, that the universities and research organizations influence the economic competitiveness of individual economies in the context of globalisation. The countries which have an expanded system of higher education with higher levels of investment in research and development (R&D) activities have higher potential to grow faster in a globalized knowledge economy (Varghese, 2013).
Similarly, higher education in Africa has been identified and recognised as a significant player in facilitating Africa’s development process (NEPAD, 2005). It has however persistently faced several challenges, particularly with growing societal demands. With few resources, inadequate capacity and a history of neglect, the sector has been struggling over the years to respond to these increasing demands, leading to ongoing capacity gaps. The sector has also suffered from inadequate funding, weak governance and leadership, low quality of academic programmes, and stifled academic freedom (Mohamedbhai, 2003; Sawyerr, 2004). These challenges require urgent intervention if the sector is to play a meaningful role.

In recent years, higher education in Africa has undergone unprecedented transformation, including phenomenal expansion of the sector in terms of numbers and diversity of institutions and academic programmes, rapid growth in enrolments, development of quality assurance frameworks, and enhancement of institutional governance, among other things. These transformations are a consequence of many new developments, both local and global, which have allowed the sector to start regaining its key position in terms of Africa’s development. Internationalisation is one of the major forces shaping Africa’s higher education sector in the 21st century (Jowi, 2010), whose impacts include several opportunities for African universities and societies and even some potential risks.

2.2.1 Higher Education and Africa’s development
It is widely accepted that higher education is a leading instrument in promoting development (Cloete, Bailey & Massen, 2011). This conviction is particularly true for Africa. Right from independence, African founding leaders clearly recognised the important role that high quality higher education could play in building the new nations. Thus, since inception, Africa’s higher education sector has viewed the developmental role as being core to its mission, purpose and mandate (Sawyerr, 2004). The year 1960, when many African countries were on the threshold of independence, was therefore heralded as the Year of Africa and marked what was termed the ‘development decade’. The role of the African
university in development was strongly emphasised, leading to the establishment of national universities in most of the newly independent countries.

At the UNESCO conference in 1962 and later at the Association of African Universities (AAU) seminar in 1972, this role of the African university was re-emphasised (Yesefu, 1973). However, in the early years of independence, not much was done by African governments or the universities themselves to promote and actualise this pivotal role. This led to universities being seen as ivory towers or luxury ancillaries which were nice to have, but not necessary (Moja, Cloete & Muller, 1996). The neo-liberal thinking, structural adjustment programmes of the 1980s, and the political changes in Eastern Europe questioned the role of the state in development and the rationale for continued state investment in higher education. The argument was for a reduced public investment in education in general, and a diversion of public investment from higher to primary education in developing countries in particular (World Bank, 1986). As a result, there was a decline in public expenditure on tertiary education in sub-Saharan African countries (Cloete et al., 2011).

With the renewed recognition in the late 1990s and early 2000s of the role of higher education in Africa’s development, there were calls to revitalise the sector through various initiatives, including international partnerships (Sawyerr, 2004). This coincided with the United Nations Millennium Summit which agreed on new development initiatives and set an ambitious agenda for reducing poverty and improving lives (McGarth, 2010). This global agenda was phrased in terms of the eight Millennium Development Goals (MDGs), with most targets being set for 2015.

Dr Koffi Annan, former United Nations Secretary General, underscored the role of the African university in the continent’s development and in the drive to attain the Millennium Development Goals (MDGs) when he observed that:

*The university must become a primary tool for Africa’s development in the new century. Universities can help develop African expertise; they can enhance the analysis of African problems; strengthen domestic institutions; serve as a model environment for the*
practice of good governance, conflict resolution and respect for human rights, and enable African academics to play an active part in the global community of scholars (Kofi Annan, quoted by Bloom, Canning and Chan, 2006).

As such therefore, the 2009 UNESCO World Conference on Higher Education constituted a key moment for African universities (UNESCO, 2009). It redefined the dynamics for these universities, including social relevance and transformation through social, cultural and economic development of societies by means of endogenic capacity building. As a result, through the African Union (AU) and continental and regional university associations, African governments embarked on initiatives to foster and benefit from intra-Africa university collaborations and other international partnerships. Consequently, in the same year 2009, in determining the role of the African university in Africa’s development, the Association of African Universities (AAU) chose the theme Sustainable development in Africa- The role of higher education for its 12th General Conference held in Abuja, Nigeria. The conference recognised the many efforts African universities had made towards sustainable development, but urged universities to combine their efforts with international partners in order to maximise the effectiveness of responses to Africa’s development needs (AAU, 2009).

The African Union Second Decade of Education Action Plan has prioritised higher education as an area for Africa’s development, with an emphasis on knowledge generation through centres of excellence, quality assurance, harmonisation, regional integration, and resource mobilisation (AU, 2008). The plan recognises that Africa has a large and growing higher education sector that can be harnessed to respond effectively to the MDGs (AAU, 2009; Jowi, 2012).
2.2.2 A challenging past
In the two turbulent decades between the 1980s and 1990s, higher education in Africa faced a period of dramatic structural change, financial and governance crises (Sawyerr, 2004; Samoff and Bidemi 2003). At the same time, the sector experienced uncoordinated expansion amid dilapidated infrastructure, deteriorating working conditions, low staff morale, worsening academic quality standards, staggering budgetary deficits, all compounded with phenomenal enrolment increases and the continuing ravaging impacts of the historic brain drain phenomenon (Sawyerr, 2004; Aina 2010). The systematic neglect and rot of African universities intensified and acquired the status of official policy during 1980s and 1990s based entirely on the flawed presumption that university education in sub-Saharan Africa yielded no clear impacts on social equity, economic growth, or poverty reduction. Higher education in Africa was seen as a costly luxury (Psacharopoulos, 1981; Hinchliffe 1985; Saint, 1992).

During the latter parts of the 1990s, however, major development organizations and industrialized countries began to recognize that higher education and knowledge production were critical for rapid economic development in every country. A report of the OECD, known as the Knowledge Economy (OECD, 1996b), is widely credited for pioneering and establishing the conceptual foundations of the ‘knowledge economy’ in contemporary development discourse. The OECD defined knowledge economies as ‘economies which are directly based on production, distribution, and use of knowledge and information’ (OECD, 1996b, 7).

Another significant transformation was the publication of the World Development Report: Knowledge for Development in 1999. This report is widely reputed for its role in deepening the knowledge economy by inserting knowledge production firmly at the core of development (World Bank, 1999b, 30). The World Banks Report, Higher Education in Developing Countries: Peril or Promise (World Bank, 2000) represented the clearest turning point on the role of higher education in developing countries. In a further policy transformation, the Bank’s Constructing Knowledge Societies report discussed in great
detail the critical importance of knowledge and higher education in promoting development (World Bank, 2002a)

The capacity of a country to produce, adopt, adapt, disseminate, and commercialize knowledge increasingly became critical for economic competitiveness, sustained economic growth, and improved welfare of society (OECD, 1996b; World Bank, 2002a). The transition to a knowledge-based economy typically involves significant investment in four fundamental elements: a supportive policy framework, advanced skills development, a vibrant innovation system, and a strengthened information technology infrastructure (Chen and Dahlman, 2006). The competitiveness of a knowledge-based economy also relies on increased connectivity and collaboration across national and disciplinary boundaries in order to mobilize diverse resources and optimize the exchange and application of knowledge (OECD, 1996a). The need for global collaboration has emerged from the realization that most problems facing contemporary society are increasingly complex, dynamic, and cross-cutting; hence no amount of research effort within one particular country or discipline or theoretical perspective can be sufficient to produce adequate or durable solutions (Obamba and Mwema, 2009, p.357).

2.3 Knowledge deficits and research capacity gaps in African universities

Whereas the traditional North-South knowledge disparities continue to prevail and even widen, the emergence of the idea of the knowledge economy during the last two decades has brought about significant shifts in the understanding of the importance of knowledge and its role in the development process worldwide. Since the late 1990s, there has been growing recognition among Northern and Southern governments as well as intergovernmental agencies that knowledge is a critical driver of economic growth and sustainable development (OECD 1996b; World Bank 2002). Although this phenomenon has been constructed as the ‘global’ knowledge revolution, the evolving proliferation of knowledge production infrastructure and its impacts on economic growth and sustainable development have been largely confined within the developed OECD countries, whereas Africa has largely remained a peripheral appendage to the global knowledge architecture for years.
Knowledge production and higher education in sub-Saharan Africa have stumbled through at least four decades of widespread and systematic marginalisation and devaluation (Samoff and Bidemi 2004; Obamba 2012). Due to the dramatic decline in financial support for African universities amidst the explosive public demand for university education, Africa’s fragile higher education infrastructure deteriorated even further and the remaining capacity for research and knowledge production was severely weakened, resulting in even deeper marginalisation of Africa in the global knowledge calculus (Zeleza 2007).

Africa is still lagging far behind in terms of public expenditure on research and development. On average, the continent spends a paltry 0.3% of its gross domestic product on research and development, whereas industrialised countries spend approximately six times that amount. It is hardly surprising that Africa has the lowest ratio of scientists in research and development in the world. To put it into perspective, African countries have an average of 35 research and development scientists per million inhabitants, whereas Brazil has 168, Europe has 2457 and the USA a staggering 4103 (AfDB, 2008, 3).

Africa accounts for less than 1.5% of the total global publications in international scientific journals and has been declining steeply in recent decades (Bloom, Canning, and Chan 2005). A recent Thomson Reuters study shows that between 1999 and 2008, the entire African continent – made up of 54 countries – produced only 27,600 papers published in scientific journals, whereas The Netherlands alone published 27,000 papers during the same period (Adams, King, and Hook 2010, 5). These large and widening asymmetries between Africa and the developed countries are a testimony to the depth of Africa’s marginalisation tragedy and the enormity of the effort that is urgently required to strengthen Africa’s knowledge production infrastructure and its capacity to make any meaningful contribution to development.

## 2.4 Science, technology and innovation

The knowledge-based economy provoked the emergence of innovation systems as a dynamic model for organising and analysing the components, processes, and outcomes of sustainable development (OECD, 1996b). The ‘innovation system’ is seen as one of the four
pillars of the knowledge economy (OECD, 1997). An innovation system is defined as ‘all the important economic, social, political, organizational, and other factors that influence the development, diffusion, and use of innovations’ (Edquist, 2001, 2). The idea of ‘innovations systems’ emerged and gained increasing prominence within science, technology, and entrepreneurship studies during 1980s and 1990s (Edquist, 2001; Godin, 2007); however, it did not command significant global influence within development policy and development economics until the publication of the seminal OECD report National Innovation Systems (OECD, 1997).

The innovation systems approach has had a widespread and tremendous impact in diverse areas, such as science, development policy, technology, macroeconomics, and scientific research (OECD, 1997; Edquist, 2001; Chen and Dahlman, 2006; Godin 2007). Within the World Bank, however, evidence suggests that the discourse and support for innovation systems is a relatively recent phenomenon, despite the Bank's historical interest in promoting Science and Technology (Watson et al., 2003, 1) and its recent tremendous focus on the knowledge-based economy (World Bank, 2002a). Several analyses emerging within the Bank during the 1990s and early 2000s have criticized the Bank for lacking a systematic policy framework and organizational capabilities for promoting S&T, especially with respect to higher education in developing countries (Dahlman, 1995, 10–11; Watson et al., 2003).

A recent review of Bank lending practice reports that the Bank lent USD 8.6 billion to support science and technology (S&T) through 647 projects between 1980 and 2004. However, the report observed that ‘of overall Bank lending only 1 in about 50 projects is principally concerned with improving science and technology’ (Crawford et al., 2006, 10). Another significant Bank Policy Research Paper (Watson et al., 2003) criticized the Bank's 'historical legacy of ad hoc promotion of science and technology’ (ibid. 26). The Paper argued that ‘attempts to raise S&T among clients have not always been sustained or systematic and these have never been articulated within a comprehensive policy or plan for improving science and technology across the board’ (ibid., 1). Bank support for S&T in the tertiary education sector has been limited for decades and has predominantly been
targeted at middle-income countries (Watson et al., 2003). The authors emphasized that ‘the challenge for the Bank is to make S&T a part of tertiary education reform for a broader spectrum of clients [read developing countries]’ (ibid. 27).

However, the global landscape has shifted dramatically in recent years and the Bank has moved to re-invent and reconsolidate itself. In July 2002, the World Bank issued a major report entitled *Strategic Approaches to Science and Technology in Development*, which reviewed the Bank’s experience and capabilities in the field of STI capacity development (World Bank, 2002b). This radical report emphasized that ‘the World Bank should be ready to play an appropriate role along with partner agencies in responding to the heightened demand to S&T-related services in the new environment of S&T prioritization’ (ibid., v). The Bank’s response came in February 2007, when it partnered with multiple agencies to convene the first Global Forum on Science Technology and Innovation to discuss strategies, programmes, policies for building STI capacity to promote sustainable growth and poverty reduction in developing countries (World Bank, 2007).

The Bank articulated a broader and more practical formulation of STI capacity building:

*STI capacity building is about building the technical, vocational, engineering, entrepreneurial, managerial, and scientific capacity to solve each country’s pressing social and economic problems, transform their societies, and have a positive impact on the standards of living and quality of life of the poorest strata of society.* (World Bank 2007)

Anchored on this new broad conceptualization, the Global Forum emphasized that capacity building for STI can no longer be viewed as a luxury preserved primarily for the wealthier countries. Instead, the report stated that ‘if developing countries hoped to prosper in the knowledge economy STI capacity building was an absolute necessity’ (ibid., 1). A major resolution of the Forum was that STI capacity building was not a diversion from poverty reduction and the MDG’s but an essential tool for achieving the MDG’s and reducing poverty (World Bank, 2007, 6). In 2010 the Bank made the most robust response to its new knowledge mandate by publishing its ground-breaking knowledge strategy paper
Transforming the Bank’s Knowledge Agenda (World Bank, 2010). This strategic framework paper was aimed at expanding the Bank’s knowledge services and defining a more systematic approach to its role as a leading producer, customizer, and connector of knowledge in a rapidly changing global environment.

In 2008, the African Development Bank issued an ambitious Strategy for Higher Education Science and Technology that was aimed to accelerate sustainable economic growth through capacity development and strengthening in science and technology in African countries. The Strategy demonstrates the growing prioritization of science and technology capacity in contemporary African development policy and discourse (AfDB, 2008).

2.4.1 The Rise of Science Technology and Innovation in African Universities
Recent trends suggest that a significant window of opportunity could be emerging for remedying and even reversing the peripheral place and role of Africa in global knowledge society. The global shift toward the knowledge economy, particularly the increasing focus on knowledge for development, has triggered an unprecedented momentum across sub-Saharan Africa to revitalize the continent’s higher education infrastructure and to reposition knowledge as a critical tool for tackling the development challenges facing the region (NEPAD 2005).

Since 2000, growing numbers of leading intergovernmental development organisations in Africa have been embracing the strategy of promoting knowledge production and knowledge management for sustainable development. The publications also demonstrate a unique focus on the importance of partnerships and cooperation at regional and international levels (Obamba and Mwema 2009). In particular, the African Union has distinguished itself at the forefront of this unprecedented African renaissance through its strategic focus on scientific capacity building, knowledge production and stimulating closer synergy between Africa’s knowledge production systems and Africa’s development priorities (AU 2005). The African Union emphasizes that knowledge production must entail ‘the generation of scientific and technical knowledge about Africa’s problems and identification of specific ways to solve the problems’ (AU 2005, 5). This definition denotes a
transformation from the classical ‘ivory tower’ African university to a ‘developmental’ African university (NEPAD 2005, 3).


The importance of knowledge and partnership is further articulated in the Africa Action Plan 2008 signed between African Union and G8 countries (AU 2008). The Association of African Universities (AAU) has also spearheaded the mission of revitalizing higher education, promoting transnational partnerships and strengthening African universities to make their contribution to Africa’s development. One of the largest and most unprecedented initiatives in this regard is the ‘Renewing the African University’ programme, launched in 2005 in collaboration with the Association of Commonwealth Universities (AAU 2005). This 10-year programme, valued at US$5 billion, focuses on strengthening education-sector governance capacity, promoting academic manpower development, significantly increasing the participation of African universities in the global knowledge economy and promoting North-South and South-South collaboration (AAU 2005, 4). Significantly, this programme is anchored on the principle that Africa’s emerging development renaissance must be driven by Africa’s own universities (NEPAD 2005, 21).

2.4.2 Role of Research, Innovation and Knowledge in Africa’s development

As we have already observed, there is an emerging body of policy documents produced in Africa that seek to provide a more detailed vision and framework for the embedding of knowledge into Africa’s development agenda. These publications seem to portray ‘knowledge’ as being directly equivalent to ‘science and technology’. This dominant discourse of scientific knowledge can be interpreted as a reproduction of the broader
global paradigm shift toward Science, Technology and Innovation over the last decade (OECD 1997; World Bank 2007b). The launch of Africa’s STI Consolidated Action Plan 2006–2010 (AU 2006b) represents an unprecedented trajectory within the emerging terrain of knowledge and development policymaking in Africa.

The Consolidated Action Plan articulates Africa’s overall vision for harnessing and applying science and technology in eradicating poverty, promoting sustainable growth and development and strengthening Africa’s fuller integration into the global knowledge and economic system (AU 2006b, 12). The Action Plan further aims at promoting the quality and intensity of regional cooperation among Africa’s scientific communities through a complex network of regional Centres of Excellence and networks clustered around 19 flagship scientific projects funded under the Africa-Europe Joint Partnership (EC 2007). The implementation framework of these projects demonstrates a dominant focus on creating new ‘research networks’ across Africa, whereas universities appear to have remained largely peripheral and disengaged in this new paradigm.

The African Development Bank is another leading intergovernmental body that has recently taken significant steps to intensify its role in strengthening knowledge-based development policy in Africa. The African Development Bank formulated its Higher Education Science and Technology (HEST) Strategy in 2008 (AfDB 2008). The Bank’s HEST Strategy is designed to contribute to the processes of production and adaptation of science and technology to accelerate economic growth in Africa and to build a critical mass of scientific expertise at vocational and technical levels across a wide range of critical areas, including agriculture, livestock, healthcare, engineering, teacher training, business management and energy. The Strategy calls for greater coherence, complementarity and multi-stakeholder networking between higher education and the productive sector if Africa is to harness the power of knowledge in development.

A critical reading of these recent policy instruments demonstrates an overwhelming preoccupation with the natural and technological sciences and a glaring absence of the social sciences, a tendency that defeats the current global emphasis on knowledge
production approaches that span disciplinary and organizational boundaries (McArthur and Sachs 2009). The notion of establishing isolated ‘centres of excellence’ is also dominant in nearly all the documents. This strategy represents a commendable starting point for capacity strengthening but, if allowed to become the overriding preoccupation, it can also bring significant dangers of creating fragmented and unsustainable, patchy islands of excellence pursuing competing or conflicting research priorities amidst large dysfunctional continental higher education sector. A recent report by the British Academy of Sciences (2009) warns of the dangers of the current focus on establishing centres of excellence; instead the report emphasizes that the priority for revitalizing and strengthening Africa’s knowledge capacities is to build and expand research networks and communities spanning across institutional, disciplinary, and national boundaries. Overall, the recent policy publications and initiatives reviewed above demonstrate to a considerable extent that knowledge and partnership are gradually converging to shape the trajectories of development policy in sub-Saharan Africa.

2.5 Partnerships for knowledge and development

The idea of partnership in global collaborative activity is not exactly new or even surprising. The UN Congress of Vienna on Science and Technology for Development, 1979, for example, had discussed the basic concepts of ‘participation’ and ‘ownership’ of development programmes but in relatively broad-brush terms. However, the contemporary discourse and architecture of global partnership in development was first articulated in the most uncertain terms by the OECD (1996) in the watershed report *Shaping the 21st Century: The Contribution of Development Cooperation*.

The partnership approach denotes that the providers of development assistance must work in mutual collaboration and consultation with multiple local development stakeholders while empowering them to take equal responsibility and be accountable for setting and achieving their own development goals (13). The partnership paradigm gained prominence as a robust critique against the distortions and asymmetries embedded within the traditional ‘problem-solving’ and donor-recipient approaches to international development that dominated between the 1960s and 1990s (Gaillard 1994; Velho 2002).
The partnership paradigm is also an indictment against the Washington Consensus regime that focused entirely on recipient countries’ total compliance with macroeconomic measures and conditionalities. In contrast, the global partnership approach is built upon a set of dynamic and pluralistic principles, including local ownership, capacity building, knowledge sharing, multi-stakeholder participation and sensitivity to local demands and contexts (McGrath 2002). In the higher education context, partnerships can be manifested as cooperative agreements between a university and another distinct organization to coordinate activities, share resources or divide duties related to specific projects (Kinser and Green 2009, 4).

The idea of global partnership for development and its connectedness to the knowledge revolution has generated significant interest in academic circles (King 2008). An important feature of the partnership approach to development is its emphasis on the idea that the boundaries of the international development landscape have been broadened to encompass multiple stakeholders (King 2008; OECD 1996a). As a result of this paradigmatic shift, universities and their boundary-spanning partnerships are now increasingly considered as critical stakeholders in promoting international development (King 2008). For instance, the Africa-Europe white paper launched in 2010 mobilized universities to ‘integrate development cooperation into their overall internationalisation strategy’ (EUA 2010, 21). This demonstrates the emerging convergence of transnational higher education partnerships and international development. In the next section, we turn to a comparative review of the characteristics and patterns of transnational partnership initiatives involving African universities.

2.6 The changing landscape of Africa’s knowledge partnerships

The emerging landscape of higher education partnerships in Africa is increasingly broad and complex but empirical information is often fragmented or non-existent. This makes it very difficult to provide adequate comparative analyses of higher education partnerships in Africa. This section examines and characterizes the diverse patterns of transnational partnerships prevailing in the contemporary African higher education landscape in order
to demonstrate how the discourses of knowledge and sustainable development are constructed and reproduced.

The idea of South-South cooperation in the general domains of political and economic affairs might have its roots in the Bandung Conference of 1955, when some 79 developing countries agreed to strengthen their voice in world politics and economic affairs through strategic multilateral collaboration. In recent decades, South-South cooperation has acquired multiple dimensions and attracted growing significance in global development policy and politics. However, South-South cooperation has a similarly long tradition within African higher education.

In the early 1960s, UNESCO convened the historic Tananarive Conference in Madagascar, which discussed strategies for promoting multilateral partnerships to support higher education in Africa, subsequently culminating in the establishment of the Association of African Universities. The launch of the AAU in 1967 and the Council for the Development of Social Science Research in Africa (CODESRIA) in 1973 represent Africa’s earliest efforts at nurturing trans-continental academic cooperation within the African continent. In recent decades, however, the scope and complexity of academic cooperation within Africa has been expanding at a more rapid pace (Obamba and Mwema 2009; Samoff and Carroll 2004).

The Africa Regional Networks Database estimated that in 2006 the continent hosted more than 120 regional networks focusing on a broad spectrum of disciplines (www.foundation-partnership.org). This phenomenal expansion trajectory reflects the findings of the 2009 International Association of Universities global survey (IAU 2010), which reported that intra-regional patterns of cooperation were prominently prioritized in most world regions, including Africa.

Another significant development in the domain of pan-African collaboration in higher education and development was the establishment of the Association for the Development of Education in Africa (ADEA) in 1989, particularly its Working Group on Higher Education,
which promotes networking, policy advocacy and capacity building (NEPAD 2005, 20). The Association of African Universities (AAU) partnered with the Association of Commonwealth Universities (ACU) to launch the 10-year Renewing the African University Programme, discussed earlier. Currently, the AAU and the Association of Universities and Colleges of Canada (AUCC) are implementing a major three-year partnership initiative known as Strengthening Higher Education Stakeholder Relations in Africa, signed in 2009.

This partnership consists of three components: strengthening strategic planning for African university outreach; stimulating effective university–industry linkages; and strengthening the capacity of the AAU and its member universities to build more effective stakeholder partnerships for capacity building and development (AAU, 2011). In retrospect, the partnerships outlined above share some vital characteristics: a clearer focus on enhancing inter-university cooperation and networking within Africa, building local capacity for governance and quality assurance, as well as intensifying the connectedness and relevance of Africa’s universities to Africa’s development challenges. It is also clear that all these collaborative initiatives are externally funded; a pattern that suggests the chronic weakness or absence of funding capacity within Africa and there production of relations of dependency (Samoff and Bidemi 2004).

A new form of Africa-wide collaborative initiative has emerged around the challenge of promoting harmonization and standardization of higher education in Africa. The African Union’s (2007) strategy for Harmonization of Higher Education Programs represents an unprecedented collaborative effort in this respect. In a broader perspective, standardization would contribute to increased pan-African academic cooperation through promoting intra-regional academic mobility and collaborative knowledge production across research networks.

Quality assurance, or the lack of it, has also become a critical concern in Africa and has attracted increasing regional collaborative efforts in recent years. The most significant initiative in terms of strategic scope and structural organization is the African Quality Assurance Network (AfriQAN), launched in 2009 by the Association of African Universities
Similarly, the current momentum to remedy the digital isolation of the African continent is becoming another formidable force behind a new wave of national, regional and transnational partnership initiatives that focus on strengthening Africa’s Internet connectivity infrastructure and lowering the costs of Internet connectivity within Africa and between Africa and the world. The best known examples of African ICT-oriented infrastructure cooperation ventures include the African Virtual University and the National Research and Education Networks. One audacious initiative is the UbuntuNet Alliance, a consortium that deploys submarine optic fiber technology and other terrestrial infrastructure to provide a backbone for trans-Africa Internet connectivity to promote regional and international research networking (Tusubira et al. 2012).

2.6.1 Africa-Europe Partnerships
Europe and Africa share a remarkably long and complex history of strategic cooperation across a diverse range of economic, political, sociocultural and scientific initiatives. Afro-European economic cooperation dates back to the signing of the Treaty of Rome (1959), which established “Regimes of Association” between the two regions and also provided for the setting up of the instruments of the European Development Funds (EC 2010). The current framework for economic cooperation between Africa and Europe includes a range of funding policy instruments, namely the Cotonou Agreement (commenced 2003), European Neighbourhood Policy (commenced 2004), and Trade Development and Cooperation Agreement (since 2004). EDFs have remained the core European instruments for providing technical and financial assistance to African countries (EC, 2010, p. 13). With respect to science and education, however, substantive bilateral scientific relations between Africa and Europe commenced with the launch of the first Science and Technology for Development Programme in 1983.

In recent years, bilateral cooperation between Africa and Europe in the field of science and technology capacity development has expanded and deepened significantly (EC 2009, 5). Bilateral scientific cooperation is primarily undertaken through the EU’s Research Framework Programs (FPs). The European Union currently is implementing its 10th EDF (2008-2013) and 7th Research Framework Program (2007-2013); and both instruments
contain large guaranteed commitments for bilateral financial and technical assistance for Africa’s development (EC, 2009; EC, 2010).

A set of recent policy instruments issued over the last decade is shaping bilateral cooperation between African and Europe and clearly demonstrate the heightened and deepening global interest in Africa’s development. In 2001, the European Commission issued the ground-breaking instrument that provided the framework for the broader European strategy on international cooperation and partnership with non-EU countries in the field of higher education and training. Although the Communication on *Strengthening Cooperation with Third Countries in the Field of Higher Education* (EC 2001) excluded any elements of academic cooperation or support for education in developing countries including Africa (4), there has otherwise been a dramatic shift in EU policy towards support for the development of education in Africa, as demonstrated in three subsequent European policy instruments.

The first key instrument in this category is the *Communication on Education and Training in the Context of Poverty Reduction in Developing Countries* (EC 2002). Reflecting on EU practice during the 7th and 8th European Development Funds implemented between 1990 and 2000, this 2002 Communication conceded that “the link between education and poverty reduction was recognized only after most of these programs had been devised” (EC, 2002, p. 8). This radical instrument therefore breaks with the past and focuses on a multisectoral and integrated approach for strengthening education, including higher education, in developing countries as a tool for fighting global poverty and achieving the Millennium Development Goals (EC 2002, 6, 8, 32, 33).

According to this Communication (p. 9), the EU embraces three strategic priorities for cooperation with Africa: basic education particularly teacher training; vocational training; and higher education, especially at the regional level. With specific reference to bilateral cooperation in higher education, the Communication’s “Common Framework” aims at strengthening institutional capacities and knowledge sharing through North-South
research collaboration and stronger transnational research networks and thematic clusters among universities and researchers in developing countries (EC, 2002, pp. 32-33).

The second instrument is the European Union Strategy for Africa (European Council 2006), which provided a framework for European assistance to Africa. The EU Strategy for Africa represents the ‘African’ element of the broader European Development Consensus initiative (EC 2006), which provides a broad framework for European development assistance to Africa (EC, 2006). Within this “Africa” strategy, the E.U. Council committed to increase its official aid budget to 0.56 per cent of the Gross National Income by 2010 and to 0.7 per cent by 2015 - with half of this aid disbursement going into supporting development programs in Africa (EC, 2006, p. 14).

As the name suggests, however, the EU Strategy for Africa represents a unilateral document crafted by the European Union ‘for Africa’ without any mutual structured African involvement or participation. The third watershed instrument is the Joint Africa-Europe Strategic Partnership launched at the Lisbon Ministerial Meeting in December 2007 (EC 2007). This document supersedes all its predecessors and represents a dramatic shift from traditional European unilateralism and Eurocentrism toward engaged bilateralism. It essentially marks the starting point for a phase characterised by a more symmetrical strategic partnership between Africa and Europe (Obamba, 2013).

In practical terms, the Joint Strategic Partnership is a comprehensive instrument that provides the current overarching policy framework for all categories of bilateral economic, political, and scientific cooperation programs between Africa and Europe. The First Action Plan (2008-2010) of the Joint Africa-EU Strategic Partnership identified a set of eight broad and high-priority “Africa-EU Partnerships” formulated jointly by the African Union and the European Union.

One of the most significant programmes within this broad and audacious bilateral arrangement is the Partnership on Science, Information Society, and Space Science, commonly known as the 8th Partnership. This partnership program is anchored on the principle that the capacity to produce, assimilate and use scientific and technological knowledge is the engine of socioeconomic growth and sustainable development in Africa,
including achieving the Millennium Development Goals (EC 2007, 77–82). The 8th Partnership is jointly implemented between the African Union and the European Union through the *African Science and Technology Consolidated Action Plan*, a broad continent-wide development blueprint formulated by the African Union (AU 2006b).

This Action Plan identifies a set of 19 ‘Lighthouse Projects’ that focus on building science and technology capacities in Africa through joint research and scientific infrastructure development and strengthening. The Lighthouse Projects have been funded through the EU’s Research Framework Programs. These involve joint research among African researchers and their European counterparts. Under the 7th Framework Program, 2007-2013 (FP7), the EU is providing euro63 Million to support joint Africa-Europe research in science and technology, including 249 projects, 529 researchers, and 37 Africa countries (EC, 2010). The 6th Framework Program, 2002-2006 (FP6), had funded 873 researchers from 39 African countries in the conduct of joint scientific research at the cost of euro93 million (EC, 2009, p. 6).

Under the broad remit of the 8th Partnership, the EU further provided a total of 460 million Euros drawn from the Ninth European Development Fund to support the launch of the EDULINK *Cooperation Programme in Higher Education* between the then 15 European Union members and 79 countries of the African, Caribbean and Pacific region (ACP 2006). The broad aims of EDULINK are to promote capacity building and regional integration in higher education through collaborative scientific research and regional networking, supporting academic quality assurance and creating stronger links between higher education and the Millennium Development Goals. At least the EDULINK initiative indicates an impressive and rare European Union focus on providing direct capacity development support to universities in the developing regions (ACP 2009).

During its first phase, between 2006 and 2008, for instance, the EDULINK Program invested some 30 million Euros to support some 66 joint research projects involving a total of 127 higher education institutions spread across 46 ACP countries and their counterparts in the EU region (ACP 2009). Analytically, the predominant character of European
cooperation with Africa is its focus on strengthening science and technology capacity in Africa, promoting Africa’s integration into the global knowledge circuit, as well as building the capability of African universities to contribute to sustainable development.

As the discussions clearly demonstrate, European Union funding and policy are predominantly focused on partnership programmes aimed at building ‘science and technology’ capacity in developing countries (Maassen, Pinheiro, and Cloete 2007, 12). Similarly, the entire 8th Partnership and all its 19 ‘Lighthouse Projects’ as well as the EDULINK Partnership Programme (discussed above) both focus exclusively on promoting ‘science and technology’ research and capacity strengthening. These tendencies suggest a consistent marginalisation of the social sciences and humanities and reinforce the view that only certain types of scientific knowledge are relevant to sustainable development.

A recent United Kingdom-Africa partnership program aims to promote stronger partnerships focusing on the social science and humanities and underscored the important contributions of these sociological sciences to the understanding, contextualisation, and realisation of development processes and goals (British Academy/ACU 2009). This move by the UK represents a critique of the EU approach that exclusively promotes cooperation in the natural and physical sciences. An equally puzzling pattern emerging from the overall calculus of European policy for scientific cooperation with Africa is the apparent peripheralisation of African universities and the subjugation of their role by new supranational entities at the regional and political levels.

It is not insignificant to recognize that the entire Africa Science and Technology Consolidated Action Plan does not explicitly or primarily position universities at the core of the deliberations for the overall science and technology capacity building strategy. Instead, the Action Plan’s predominant implementation framework seems to focus on the establishment of new ‘centres of excellence’ at the supra-national level without embeddedness within the existing institutional infrastructure of African universities (AU 2005, 6, 10). From a critical perspective, this emerging ‘centre-of-excellence syndrome’ in Africa could result in further dislocation and fragmentation of Africa’s fragile knowledge
production and sharing capacities and erode its potential for integration into the global knowledge circuits (Obamba 2013). Indeed, a recent report of the British Academic and the Association of Commonwealth Universities affirmed that African universities and governments need to focus on building and strengthening research networks and communities across national, institutional and disciplinary boundaries; rather than being preoccupied with creating isolated ‘centre of excellence’ (British Academy/ACU 2009).

Overall, the three EC instruments examined above have shaped European education policy and provided an impetus for E.U.-member countries to strengthen international cooperation with developing countries by embedding the Millennium Development Goals and poverty reduction at the core of transnational education cooperation. A further development in the deepening of Africa-Europe partnerships is the *Africa-Europe White Paper on Higher Education Cooperation for Development* launched in September 2010 by the Association of African Universities and the European University Association (EUA/AAU, 2010). Although the *White Paper* does not constitute a binding policy document within the European or African political calculus, it nevertheless represents a significant development in mobilizing universities in both regions to “integrate development cooperation into the overall institutional internationalisation strategy” (EUA/AAU, 2010, p.21). The *White Paper* is important because it reflects the continuing mainstreaming of higher education into the broader landscape of Africa-Europe development cooperation.

Apart from the European intergovernmental efforts discussed above, there is also a large and growing profile of higher education partnership initiatives supported at the bilateral and inter-agency levels (Teferra, 2010). France, United Kingdom, Germany, Finland, Netherlands, Belgium, Sweden and Norway are the leaders in bilateral higher-education projects and funding in Africa (Maassen, Pinheiro, and Cloete, 2007, p. 13). A large proportion of bilateral funding for academic collaboration programs is channelled through specialized government development assistance agencies. Examples include the Netherlands Development Assistance Research Council (RAWOO), the Swedish International Development Agency (SIDA), Belgium’s Flemish Interuniversity Council (VLIR-UOS), Norway’s NORAD, and the UK Department for International Development
(DfID). Similarly, Germany’s Academic Exchange Service (DAAD) promotes development cooperation, internationalisation, capacity building, and knowledge exchange between Germany and 50 African countries (DAAD, 2009, p. 20).

2.7 Opportunities from internationalisation
Internationalisation of higher education is now a reality impacting on higher education across the world in different ways and leading to different consequences. It presents varied challenges, opportunities and even risks requiring equally varied responses from universities (Jowi, 2009). African universities are also engulfed in this context and in addition to the many challenges they face, they have to deal with the growing complexities of internationalisation (Teferra, 2008). This is at a time when uncertainty surrounds the potential of African universities in the knowledge society and their capacity to meaningfully utilize the opportunities while at the same time respond meaningfully to the challenges of their contexts. As the world around us becomes ever more globalized, higher education leaders, policy makers as well as university faculty, staff and students are becoming more actively involved in internationalisation (IAU, 2010).

Internationalisation has diverse implications to higher education in Africa. The purpose of internationalisation, its value and benefits are gaining impetus. Globally, there is consensus that internationalisation is desirable and has positive outcomes (IAU, 2010) though the main goals and drivers of internationalisation varying regionally (Knight, 2008). The main rationale for African universities to engage in internationalisation is mainly academic and aimed at institutional strengthening, enhancement of research capacities and knowledge production (Jowi, 2010).

Internationalisation could also enable African universities address the resource challenges that inhibit research, innovations and enhanced internationalisation. African higher education has continued to depend heavily on external resources for internationalisation activities (Oyewole, 2009; Teferra, 2008). They could augment this with institutional resources to benefit more from global opportunities and respond to their increasing challenges. Considerable support for international collaborations, research projects and
scholarship still comes from the developed countries. Bringing in a meaningful and sustainable international dimension requires substantial funding (Jowi, 2008). The perceived low quality of academic programs, weak regulatory frameworks (Jowi, 2009) and low research productivity standing at a meager 1.5% of the world’s total could also be enhanced by international collaborations. Using international collaborations to strengthen research and innovations could promote scientific and economic development in Africa and also to enable the continent address its myriad challenges.

Internationalisation also presents a viable way to respond to the human resource capacity challenges in African universities through capacity building, specialized training and mentorship programs. Internationalisation has already contributed enormously to capacity building in several African universities and also enriched research capacities, curriculum and teaching methods (Ogachi, 2009). Most collaborations between African universities and universities in developed countries have been for graduate training in specialized areas (Shabani, 2008) where African institutions face considerable challenges.

Training talented young researchers is a challenge for many African institutions and requires building capacity especially at doctoral level. This is crucial for the development of institutional and national research capacities thus the need to produce more doctoral graduates. Research collaboration is also a priority of the African institutions for generating innovative capacities for social and economic development. Research collaborations between Africa and developed countries should thus focus on this as a contribution to knowledge generation and exchange and as a capacity building measure for institutional development (Jowi, 2012; EUA, 2010).

While governments have responsibilities to develop policies to mitigate brain drain, beyond government interventions universities should consider institutional strategies to limit brain drain. Mobility of international students to Africa is another possibility that has not been fully explored but which deserves more attention. Africa should however in the meantime maximize on internationalisation frameworks on the continent to foster intra-Africa mobility.
Internationalisation can help address global inequalities and the lopsided knowledge and innovation systems by promoting joint researches and innovations, sharing research outcomes and making research by African scholars visible globally (Oyewole, 2008). There are also possibilities of influencing institutional management and governance reforms and utilizing university partnerships to address key societal challenges (Mohamedbhai, 2008). Ogachi (2009) underscores the positive outcomes of university partnerships in fostering community developments in Kenya.

2.8 Conclusions
This paper has examined the current landscape of higher education partnerships as one significant and growing dimension of internationalisation in African higher education. The unfolding debates and range of initiatives in Africa around the emerging role of knowledge and STI (science, technology and innovation) in development policy within the context of the knowledge-based economy are identified and interrogated. The analysis suggests that transnational higher education partnership has become a major priority both at institutional and governmental levels across the region.

There’s a growing body of policy instruments and programs that focus entirely on strengthening and expanding research networks and other forms of boundary-spanning collaborations among African universities as well as between African institutions and their counterparts in industrialised countries. Knowledge and STI are becoming increasingly embedded into the emerging discourse of sustainable development at national and regional levels; however it remains debatable whether African universities have the capacity and infrastructure to make a robust contribution to the emerging knowledge-based economic landscape.

Internationalisation landscape remains fragile and narrowly defined. This is particularly because, in the absence of any recognizable in-bound student mobility into Africa or cross-border provision of African education, transnational partnership remains the only meaningful form of internationalisation available to most African universities. But Africa’s
position in the global partnership landscape is still vulnerable to various patterns of power and resource asymmetric and dependencies.

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Chapter 3
Prof. Goski Alabi, University of Professional Studies, Accra (UPSA) – Ghana

Case study on Ghana

3.1 Introduction
The paper presents a snapshot of management of research and innovation at institutional and policy levels in Ghana. The aim is to provide insights into the knowledge and skills requirements for effective leadership and management of research and innovation Africa. Ghana is one of the countries selected for the study as part of an Organization for Economic Cooperation and Development (OECD) project on the subject in Africa. The paper employed an exploratory approach based on reviews of existing documents and survey to gain perspective into the subject. The paper focuses on three key objectives and is organized by six broad themes based on the typology. An overview of the economy of Ghana and the Higher Education Sector are presented to lay the contextual foundation upon which the six key themes are explored. The objectives of the paper are:

• To identify key providers and summarize the essential elements of existing and evolving programs for knowledge and skills development in leadership and management of research and innovation, and

• To develop a typology of the knowledge and skills required for effective research and innovation management.

• To develop strategies and options that developing countries could adopt, in order to address their knowledge and skills gaps and build capacity for more effective research and innovation management.

The paper covers the six broad themes of the typology i.e. (i) Leadership in R&D by governments (ii) Leadership of research in institutions (iii) Management to support leadership of research in public institutions (iv) Leadership of researchers in institutions
Management to support leadership of researchers and (vi) Personal behaviors and qualities of research leaders and managers

The paper adopts an exploratory qualitative approach based on reviews and a survey of three public universities as well as the Council for Scientific and Industrial Research (CSIR) to provide a snapshot on research and innovation management in Ghana. The survey instrument had 20 open ended items on the six thematic typologies. The three universities used for the snapshot were the University of Ghana (UG) Legon, the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi and the University of Professional Studies Accra (UPSA).

The three institutions were purposively chosen to cover for age, size, areas of focus or specialty and location. The paper presents an overview of the research mission of public universities and the CSIR using information from three universities, as well as the Council for Scientific and Industrial Research (CSIR). The CSIR has 13 Research Institutes that undertake, disseminate, popularize and commercialize research output for socio-economic development. The paper also drew from presentations at the National policy forum on tertiary education on the theme: Repositioning Tertiary Education for National Development which took place in Accra from 8th -9th May, 2013.

3.2 Overview of the Economy of Ghana

The World Bank classifies Ghana as a Lower Middle Income Country. The country anticipated a growth rate of 14.1% in 2011, with the outlooks for agricultural, industrial and service sectors all showing positive. Life expectancy rose in the two years after 2009, from 58 to 60; and the workforce is 49.2% female (IMF, World Economic Outlook, 2011). Against this demographic and economic background, demand for higher education is growing. Enrolment in Tertiary institutions has continued to expand, surpassing the target of 174,574 for 2012 with 185,268 by 2011 in public institutions alone and an additional 32, 275 in private institutions in the same year (Draft Education Sector Performance Report, 2012).
In 2009, Ghana was the second largest cocoa and the ninth largest gold producer in the world, while its nascent oil industry was expected to generate revenue of EUR 291m in 2011 (The Economist Pocket World in Figures, 2012). Ghana is thus internationally classified as an “emerging economy” rather than a “least developed economy” (IMF World Economic Outlook, 2011). Additionally, available data indicate that Ghana has long achieved target one of the United Nations Millennium Development Goal (UN MDG 1), which is to halve the proportion of people living in absolute poverty by 2015 (UN, 2010). The overall standard of living in Ghana has been improving steadily with the international purchasing power of the country and of individuals having grown by a factor of 7 and 3 respectively over 30 years. This is against the fact that the population in Ghana has doubled during the same period (IMF, 2011).

According to the World Bank, absolute poverty refers to people living on less than one dollar ($1) a day. However, Gondwe and Walenkamp (2011) notes that theoretically Ghana did not suffer absolute poverty in the three decades, with each person having $1.37/day to spend in 1980 and $4.40/day to spend in 2009 (please note: annual figures divided by 365 days). GDP growth has also been increasing steadily with 4.0 per cent in 2009, 7.7 per cent in 2010 and 13.6 per cent in 2011 (MOFEP Budget, 2012). Inflation which was 18.1 per cent at the end of 2008, stood at 8.40 per cent in September, 2011 (MOFEP Budget, 2012). The Services sector grew by 4.2 per cent and contributed 48.1 per cent as its share to GDP, still making it the largest contributor to GDP in 2011. The population as estimated by July 2011 is 24,791,073, with 36.5% (male 4,568,273/female 4,468,939) being between the ages 0-14 years, while 60% (male 7,435,449/female 7,436,204) is between the ages 15-64 years and 3.6% (male 399,737/female 482,471) 65 years and over (www.indexmundi.com/ghana/demographic.profile).

Against this economic and demographic background, Gondwe and Walenkamp (2011) report that the 2006 national census held by the GSS shows that middle and higher education (i.e. universities, polytechnics, specialized colleges, technical and general secondary schools and technical training institutes, both public and private) contribute only 9.4% of the personnel in the Ghanaian labour market. All other employees have less
than a senior secondary level education (28.6% completed their primary and junior secondary education, 26.7% attended primary and junior secondary school but did not complete the education and 35.3% have no formal education). Considering the fact that the share of workers with a higher education is limited and that the output of primary and junior secondary school is also limited, it can be said that Ghana has achieved remarkable success in its macro-economic climate but not in educational attainment.

3.3 The higher education system in Ghana

Alongside the thirteen research institutes and government agencies are the universities and other tertiary institutions which also perform the important task of undertaking research and training the high level human resource to apply and translate research outcomes into innovative and development outcomes. By the end of 2012, Ghana had nine (9) Public Universities, 6 Public Specialized/Professional Colleges, 54 Private Universities/University-Colleges, 10 Polytechnics and one regionally owned university. All of these institutions are supposed to undertake research and harness innovation to complement the efforts of the research institutions and together feed the countries development agenda (Draft ESPR, 2012, NAB website 2012).

Ghana therefore has in place many of the individual components necessary for an efficient and effective STI system. However, research in these institutions has not supported the development agenda in Ghana as much as is required though some gains were made with respect to innovation in 2012 (Global Innovation Index, 2012).
### Table 1: History of the Development of Public Universities/Institutions in Ghana

<table>
<thead>
<tr>
<th>No.</th>
<th>University</th>
<th>Date of Establishment</th>
<th>Legislation for Full University Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Ghana, Legon</td>
<td>1948</td>
<td>Act 79, 1961</td>
</tr>
<tr>
<td>2</td>
<td>Kumasi College of Technology which later became Kwame Nkrumah University of Science and Technology, Kumasi</td>
<td>1952</td>
<td>Government Ordinance on 6th October, 1951</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1961</td>
<td>Act of Parliament</td>
</tr>
<tr>
<td>3</td>
<td>University of Cape Coast</td>
<td>1962</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>University for Development Studies, Tamale</td>
<td>1992</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>University of Education, Winneba</td>
<td>1992</td>
<td>Act 672, 2004</td>
</tr>
<tr>
<td>6</td>
<td>University of Mines and Technology, Tarkwa</td>
<td>2001</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>University of Health and Allied Sciences, Ho</td>
<td>2011</td>
<td>Act 828, 2011</td>
</tr>
<tr>
<td>8</td>
<td>University of Energy and Natural Resources, Sunyani</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>University of Professional Studies, Legon</td>
<td>2012</td>
<td>Act 850, 2012</td>
</tr>
</tbody>
</table>

*Source: Compiled by Author, May 2013*
### Table 2: Number of Tertiary Institutions in Ghana

<table>
<thead>
<tr>
<th>Public and Private Tertiary institutions</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Universities/university colleges</td>
<td>8</td>
</tr>
<tr>
<td>Public Specialized/Professional Colleges</td>
<td>6</td>
</tr>
<tr>
<td>Regionally-owned University</td>
<td>1</td>
</tr>
<tr>
<td>Chartered Private Tertiary Institutions</td>
<td>3</td>
</tr>
<tr>
<td>Private Tertiary Institutions</td>
<td>52</td>
</tr>
<tr>
<td>Polytechnics</td>
<td>10</td>
</tr>
<tr>
<td>Public Colleges of Education</td>
<td>38</td>
</tr>
<tr>
<td>Private Colleges of Education</td>
<td>3</td>
</tr>
<tr>
<td>Public Nursing Training Colleges</td>
<td>13</td>
</tr>
<tr>
<td>Private Nursing Training Colleges</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>138</strong></td>
</tr>
</tbody>
</table>

*Source: Education Sector Performance Report 2012, NAB Website 2012*

#### 3.3.1 Enrolment trends

The total student enrolment in the public universities in 2011 was 185,268 and 32,275 in private institutions in the same year. Enrolment in the 10 public polytechnics represented about a third of total enrolment in the 8 public universities (ESPR, 2012; Mohamedhai, 2008).
Table 3: Enrolment Trends in Tertiary Institutions in Ghana 2007-2011

<table>
<thead>
<tr>
<th>INSTITUTION</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006/7</td>
</tr>
<tr>
<td>Public Universities</td>
<td>88,445</td>
</tr>
<tr>
<td>Polytechnics</td>
<td>28,695</td>
</tr>
<tr>
<td>Colleges of Education</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>117,140</td>
</tr>
<tr>
<td>Enrolment in Private Universities</td>
<td></td>
</tr>
</tbody>
</table>

Source: Provisional Education Sector Performance Report (2012)

3.3.2 Financing of higher education in Ghana
The Education Sector Performance Report (ESPR, 2012) notes that education in Ghana is mainly financed by the Ministry of Education (72% in 2008), the GETFund (9.5% in 2008), internally generated funds by institutions (9% in 2008) and multilateral and bilateral donors (9.5% in 2008; Ghana MOESS, 2008). In 2011, education expenditure as a percentage of Government of Ghana (GoG) expenditure was 25.8% making it the largest government expenditure. However a large segment of the educational expenditure goes to primary and secondary education.

3.3.3 Regulatory Framework
Ghana also has a well-coordinated tertiary education sector. Following the recommendations of the University Rationalization Committee and the subsequent Government White Paper (1991) on the Report, three regulatory agencies were established. These are: the National council for Tertiary Education (NCTE), the National Accreditation Board (NAB) and the National Board for Professional and Technician Examinations (NABPTEX). NCTE is charged by law to advise the Minister responsible for education on the development of institutions of tertiary education and to formulate policies.
NAB has responsibility for accreditation of both public and private institutions with regard to the contents and standards of their programmes. The Board determines, in consultation with the relevant institution, the programme and requirements for the proper operation of that institution and the maintenance of acceptable levels of academic or professional standards. Determination of the equivalence of diplomas, certificates and other qualifications awarded by institutions in Ghana or elsewhere is also conducted by NAB. NABPTEX is responsible for formulating and administering schemes of examinations, evaluation, assessment and certification for professional bodies, non-university tertiary institutions and private institutions. (MOESS, 2007; Effah & Hofman (ed.) 2010).

3.4 Research, knowledge production and innovation in Ghana

The framework for the management of research, knowledge and innovation is made up four key components, which includes institutions, laws and policies, regulation and the social environment. The major institutions relating to the coordination of policy for the purposes of enhancing production and utilization of research and innovative outcomes to drive socio-economic development in Ghana are the National Development Planning Commission (NDPC), The Ministry of Environment, Science and Technology (MOEST), the Ministry of Education (MOE), the Research Institutions coordinated by the Council for Scientific and Industrial Research (CSIR), the Universities and other tertiary institutions and the National Council for Tertiary Education (NCTE). In addition, the STI policy notes that Ghana has technology support and regulatory agencies, and standardized intellectual property (IP) legislation and generally stable macroeconomic political conditions necessary for innovation and development (UNCTAD NSTI Policy Review, 2011).

It appears that in Ghana, research and innovation is equal to Science and Technology activities and outcomes. Hence Research and Innovation is often used to connote Science, Technology and innovation. Social science research has not been given much attention, thus a weak link between the articulation of science and technology research and its relation to social science research. However, it is hypothesized that the weak collaboration or link between social science, particularly the management sciences and science and
technology may contribute significantly to the inefficiencies in STI management or the low output of STI in Ghana.

The National Science, Technology and Innovation (STI) Policy (2010) is the key policy document that drives research and innovation in Ghana. The policy notes that from independence onward, Ghana’s leaders have recognized that STI should play a central role in modernizing Ghana’s economy, improving living conditions, and solving social problems. This recognition spawned several previous efforts to modernize the STI system and ensure that Ghana’s research institutes and universities live up to their promise of serving as an effective instrument for Ghana’s growth and development.

STI has been highlighted in almost every recent Government vision and planning document, including Vision 2020, the subsequent Vision 2015, the National Science and Technology Policy of 2000, and the current GPRS II. The Ghana Poverty Reduction Strategy Paper I (1996 – 2005) has a section on science and technology. Further, Ghana’s Growth and Poverty Reduction Strategy (GPRS II, 2006-2009) also makes reference to the importance of Ghana’s national development. The GRPS II makes it clear that science, technology, and innovation are to be key elements of Ghana’s development strategy. (National Science, Technology and Innovation Policy, 2010)

3.4.1 Institutional frameworks for research and innovation in Ghana
Right from Ghana’s independence in 1957, the founding father Dr. Kwame Nkrumah, spelt out clearly a vision of rapid development based on the application of S & T. Nkrumah noted that;

“Our whole educational system must be geared to producing a scientifically-technically minded people”

The National Science and Technology policy (2010) notes that this vision drove the impressive institutional arrangements made within a few years after independence to apply research, science and technology to national development. Consequently a National Research Council was established in 1958 to operate full-time scientific research institutions to study and develop appropriate technologies to support the country’s
development. A Ghana Academy of Learning, a learned society, was established in 1959, which became the Ghana Academy of Sciences in 1961. In 1963 the National Research Council merged with the Academy which assumed responsibility for ten full time research institutes and projects whose programmes were directly related to the nation's economic and social development.

In 1966 following the overthrow of Dr. Nkrumah changes were made to the Academy which became the Ghana Academy of Arts and Sciences (GAAS), and the Council for Scientific and Industrial Research (CSIR) which in its present form was re-established in 1996 with 13 Research Institutes. The CSIR is currently the umbrella body of thirteen (13) research institutes in Ghana based on different disciplines ranging from animal research, forestry, engineering and technology. Over the years more scientific and technological institutions were established. These include the Ghana Atomic Energy Commission, Environmental Protection Agency, Noguchi Memorial Institute for Medical Research and the Ghana Standards Board among others (NSTI Policy, 2010).

Through collaboration with international scientific organizations, the CSIR Secretariat has become the research hub that houses various scientific research organizations including: Ghana Office - International Water Management Institute (IWMI), Africa Regional Office- The Brazilian Agricultural Research Corporation (EMBRAPA), International Food Policy Research Institute (IFPRI), and Alliance for a Green Revolution in Africa (AGRA).

3.4.2 Institutional capacities for research and innovation

Universities in Ghana are empowered to set their own priorities for academic programming, curriculum content and structure, teaching philosophy and research agenda, subject to laid down requirements and procedures by the National Accreditation Board (NAB), National Council for Tertiary Education (NCTE) and the Governing Councils. The type and nature of academic programmes are, however, restricted by the law establishing the university, NCTE guidelines for programme introduction and by accreditation.

The Innovation Index Report (2012) notes that Ghana has made some significant gains with respect innovation moving from a position 114 out of 141 countries in 2010 to a rank
of 90 out 141 countries in 2012. In the face of these recent gains made in innovation, the UNCTAD Review of the National Science and Technology Policy (2011), notes that, the capacity of the STI system overall is limited in comparison to those of middle-income countries such as India or South Africa, and the system overall is not performing to a standard that will enable the country to achieve its aspiration of becoming a truly middle-income economy. The report further notes that Ghana’s policies and institutions for science, technology and innovation have not been modernized, nor have they been aligned to economic growth and human development goals. The report further notes that a key feature of Ghana’s institutional landscape is the weak links and poor positive feedback between and among institutions, including the higher education and research institutes and the private sector. More importantly, there are no incentives to work together and few mechanisms to encourage communication and collaboration.

Additionally, the UNCTAD STI policy review (2011) notes that the institutions of education and training are not producing enough graduates with the required skills to spur technological innovation for economic growth. This is a major barrier to sustainable improvement of the country’s technological performance and to growing a national system of innovation sustainably. Consequently the need for a systematic and concerted approach to integrate the STI Policy into Ghana’s national development strategy is crucial. Such a process should lay particular emphasis on cascading of the national strategic goals into actions that will improve business and the quality of life for all Ghanaians in a sustained manner. Success should be reflected in better healthcare for the people, innovations to make Ghana’s businesses more productive and competitive, the modernization of farming and agribusiness, and an improved ability to address the challenges of climate change.

**3.4.3 Funding of Research, and Innovation in Ghana**
The status accorded science, technology and innovation in Ghana by public sector arrangement is low. Science and technology have a low priority rating in the eyes of policy makers and managers of the nation’s resources. This has resulted in the inadequate allocation of the nation’s budget to science, technology and innovation. Research and Development is not a key priority as suggested by national fund allocation. Consequently,
research priorities are often tailored towards the expectations of donors than conscious and systematically planned priorities that are derived from national research and development agenda (Annual Report of the CSIR, 2011).

The inadequate support for Science and Technology is manifest in the country's resource allocation to science and technology which has fluctuated between 0.3 and 0.5% of the Gross Domestic Product (GDP). Ghana’s expenditure on Research and Development was about 0.3 per cent of its gross domestic product (GDP) in 2008, nearly all of which comes from government outlays equivalent to around $49 million or 1.1 per cent of the budget as indicated in table 4. This allocation is well below the target of 1% of the country’s GDP prescribed at the Summit of African Heads of State of the Organization of African Unity (OAU) in 1980 under the Lagos Plan of Action and adopted by the AU as a critical means of realizing the goals and objectives of the New Partnership for Africa’s Development (NEPAD). This does not compare well to South Africa, for instance, which spends 0.87 per cent of its GDP on formal R&D (OECD, 2007) or to Korea, Singapore and Taiwan spend as much as 2% of GDP on Science and Technology.

Table 4: Research and Development Expenditure in Ghana for 2008

<table>
<thead>
<tr>
<th>BUDGET LINE ITEM</th>
<th>AMOUNT</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total government expenditure</td>
<td>4,292,084,203</td>
<td>100</td>
</tr>
<tr>
<td>Basic research R&amp;D</td>
<td>201,500</td>
<td>0.005</td>
</tr>
<tr>
<td>R&amp;D General public services</td>
<td>151,412</td>
<td>0.004</td>
</tr>
<tr>
<td>R&amp;D Economic affairs</td>
<td>44,314,486</td>
<td>1.032</td>
</tr>
<tr>
<td>R&amp;D Health</td>
<td>3,942,081</td>
<td>0.092</td>
</tr>
<tr>
<td><strong>Total S&amp;T</strong></td>
<td><strong>48,609,479</strong></td>
<td><strong>1.133</strong></td>
</tr>
</tbody>
</table>

Source: UNCTAD Review of the National Science and Technology Policy, 2011
* Budget represents estimates, not actual. ** New Ghanaian cedis and United States dollars were close to a 1:1 exchange rate during the 2008 budget year. Source: Republic of Ghana (2008b).
Though a Science and Technology Research Endowment Fund (STREFund) has been established, the National policy observes that the STREFund is minimally endowed (NSTI Policy, 2010). On the contrary, the UNCTAD Policy Review Report notes that though, the level of overall expenditure is not enough to support high-quality STI activities across the existing system. There is no indication that allocations for STI activities in Ghana will increase any time soon. However, this does not necessarily mean that more resources are required, or indeed, that additional resources would fix the Research and innovation problems.

The UNCTAD review notes that most of the funding that exists goes into salaries and some operational costs (over 90 per cent at both the universities and the research institutes), with little left for actual research. Rather, the report recommends that the Government must determine which areas and activities of the STI system are necessary and important, and must properly fund them to allow in order for STI to fulfill Ghana’s developmental goals. Any proposed new resources should be accompanied by substantial improvements in efficiency and incentives in order to turn new expenditures into development gains. Already the Council for Scientific and Industrial Research (CSIR) has been challenged to wean itself from government subventions within the next three years (Oteng Gyesi, Minster for Environment Science and Technology, 12th March 2013).

In addition to the STREFund, there are two main sources of funding for research in tertiary education. These are the Ghana Education Trust Fund (GET Fund) and the annual subvention provided by government. The government, through its budgetary appropriations, pays book and research allowances to academics of tertiary education institutions to enable them to procure some publications and other inputs required to carry out their teaching and research functions. The GET Fund was established by the Ghana Education Trust Fund Act 2000, Act 581 and is funded through Value-added Tax (VAT). VAT was increased from 10% to 12.5% in 2000, and the GET Fund is financed with the additional 2.5 percentage points (Effah etal. 2009).
The Fund has, since 2003, been making available funds for research and staff development to tertiary education institutions through the NCTE. In line with its mandate, NCTE has developed a formula for the allocation of GET funds for research and staff development. Sixty percent of the funds allocated for research and staff development is made on the basis of student enrolment and 40% on what has been termed as an equalizing factor.

The UNCTAD report further indicates that a number of studies have identified key limitations and weaknesses in Ghana’s STI system. These include the fact that the STI system is far too supply-driven, owing to its overreliance on the public budget and on external sources of funding including donor-sponsored projects based on donor agendas. Funding allocations are determined by the Government and often do not relate to the priorities of the providers of science and technology services (i.e. the research institutes and universities) and much less still to the end-users of technology and research, such as the private sector, farmers, and informal enterprises. The result is a system not subject to competitive pressures to ensure quality, and not adequately focused on Ghana’s own economic and social objectives.

3.4.4 Constraints limiting STI application in Ghana
According to the STI policy review (2011), Ghana has made much investment in science and technology infrastructure. However, these investments have not yielded the expected improvements in economic growth. This can be attributed to a number of constraints including
the inadequate scientific expertise in the country; the lack of advocacy for S & T at high political and policy levels; low science culture among the population; weak mechanisms for the management of S & T; ineffective coordination; inadequate budget and resource allocation; weak linkage between policy formulation and national development planning; weak mechanisms for implementation, evaluation and review; weak linkages between various agencies and organizations in S & T; weak linkage between industry and S & T; over reliance on the use of foreign expertise to the neglect of the use and development of local expertise, Poor performance of majority of senior high school graduates in the WASSCE (Culled from the STI Policy Review Report).
As part of Government’s commitment to build a better Ghana through the use of Science, Technology and Innovation, the Ministry of Environment, Science and Technology in collaboration with the GETFUND has instituted the Mathematics, Science and Technology Scholarship Scheme (MASTESS). This is to encourage students to study Mathematics, Science and Technology at both the Second Cycle and Tertiary levels. Additionally, laptops are distributed to students to empower the youth with technical equipment.

3.5 Role of Universities and Research Institutes in Innovation and National Development

The various Acts or laws establishing the Public Universities, and Polytechnics mandate them to undertake teaching, research and extension services. It must be noted that in responding to the question on which policies drive the research agenda in the universities, all three universities mentioned the law establishing the universities, with no reference to the National Science, Technology and Innovation Policy, or a national research agenda or strategy. Additionally in response to a question about how the university develops their research agenda, there was no mention or reference to any external policy or national research strategy document. This suggests that national research and innovation is not well coordinated or based on a concerted approach.

The University of Ghana reports that research agenda is developed by Senior Management in consultation with key stakeholders taking into consideration national development priorities and plans. The research agenda aims at contributing to national growth and development. While the KNUST indicated that each college develops its own research agenda which is in line with the universities mission and vision.
Table 5: Funding of Research in the Universities

<table>
<thead>
<tr>
<th>Research Budget</th>
<th>University of Ghana</th>
<th>KNUST</th>
<th>UPSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of the total university budget is for research</td>
<td>10%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>National budget for research in your university? %</td>
<td>- N/A</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>University's contribution to annual Research Budget %</td>
<td>10%</td>
<td>5</td>
<td>10%</td>
</tr>
<tr>
<td>Industry in Ghana contribution to research fund? %</td>
<td>- N/A</td>
<td>5</td>
<td>-N/A</td>
</tr>
<tr>
<td>Donor funds mainly through competitive grants</td>
<td>90%</td>
<td>60%</td>
<td>70%</td>
</tr>
</tbody>
</table>

*Source: Survey results, May 2013.*

3.6 Promoting Research and Innovation in Ghanaian Universities

The following section mainly discusses the initiatives taken by the institutions, the government and development partners in strengthening research and innovations in Ghana. These are however not exclusive.

3.6.1 Establishment of Research Management Offices

One of the initiatives is the establishment of research management offices. The University of Ghana established the Office of Research, Innovation and Development (ORID) in 2010 to foster and enhance research in the University, as part of its efforts to support and promote research. ORID’s mission is to promote, coordinate and facilitate research activities in the university, and also to lead the development of the university's strategic plans, including business plans and fund-raising strategies.

ORID aims at promoting creativity and innovation that supports cutting-edge research which advances the frontiers of knowledge and promotes national development and has the specific responsibility of developing and implementing the University’s research policy; raising funds for research; ensuring effective distribution and efficient use of research funds, in line with priority areas identified in the University's strategic plan; setting standards and ensuring effective dissemination of high quality research output;
representing the interests of the University in contractual relationships, grant applications and administering contract research; establishing systems for ethical clearance; and registration, patenting and commercialization of intellectual property.

3.6.2 Developing policy and capacity for managing research
The University of Ghana has taken the lead and developed an Intellectual Property Policy, an Ethics Policy and a Research Policy as well as Recruitment of Research Development Officers to promote and facilitate research at the Faculty level. The KNUST has also taken a number of initiatives, these include the establishment of a Technology Consulting Centre, to promote Research and Innovation and an office for research Grant Management.

The UPSA has also developed the Research Policy and a research fund. It has also instituted competitive mechanisms for selecting and sponsoring research to fit into its strategic objectives. The university has put in place an incentive to harness creativity and innovative ideas and uses this as part of the weighting criteria for promotion of academic staff.

The UPSA on the other hand uses the concept of institutional research agenda, which is coordinated by the Research Directorate. The directorate collates the annual research agenda from faculties and departments which is presented for reviewed and approved by the Research and Conferences Committee, with final approval by the Executive committee. The Executive Committee comprises all Deans and Management. Selection and allocation of funds for research is based on an internal competitive process based on a double blind mechanism.

Though the Research policy which outlines this process stipulates that the review and selection process should be double blind, in practice the process is not completely double blind because the team receiving the documents internally at the research directorate are known and the officers at the research directorate also know who submits which documents. To mitigate this limitation, the University now selects and sends the short listed proposals to an external partner for a more objective view. The process which is
contained in the UPSA’s Research policy is to promote collaboration among different faculty where there is a related interest and also to prevent duplication of research activities within the university. The UPSA does not however, have a mechanism for tracking duplication or collaboration with external peer institutions in the country. A national forum for setting and reviewing annual research agenda will be needed to improve on research management at the national level. This will allow the research institutions and the universities to collaborate better, avoid duplication and save resources for research and innovation in other areas.

3.6.3 Transparency and accountability of research
To respond to the need for transparency and accountability in research, some steps have been made. At University of Ghana management of research projects is done by the University’s research office (ORID) with oversight from the Pro Vice-Chancellor for Research Innovation and Development. The university also created an External Funds Unit which audits projects and maintains project financial information. They also publicize research opportunities and set clear guidelines for applications.

At KNUST, the research grants manager coordinates all research activities under the supervision of the Pro-Vice Chancellor. The research Team always have qualified accountant, to ensure that all requisitions, in respect of the accounts are followed. At the UPSA, the Research Committee which is a statutory Committee oversees the work of the research Directorate which together are responsible for Research proposal assessment, approval of research agenda, management of the research funds to ensure proper accountability and monitoring of research output to ensure that the project is undertaken in-line with the Term of Reference, as well as timely reporting and dissemination of research output. The directorate ensures that the research projects stays on track and when there are conflicts amongst team members resolves them, or arranges a replacement when a team member for some reason have leave the project team. The Directorate undertakes mid-year reviews and reports to the Executive Committee.
3.6.4 Identification of research priorities
According to the University of Ghana, information obtained through consultations with Faculty help to identify the research priorities including focus areas of faculty as well as the main constraints of the current operating conditions that prevent faculty from routinely producing world class research outputs and publications. With this, the university is able to come up with strategies to address the issues outlined and increase the research quality and productivity at the University.

In the KNUST, individual researchers and departments set their own research agenda which should be part of the university’s vision. In the UPSA, the Enterprise Research and Development Centre which is responsible for strategic planning ensures that the annual strategic objectives and targets for research have been teased out from the strategic plan and communicated to the Research Directorate, faculties and Departments in the entire University. The faculties have responsibility to cascade these objectives and ensure that their research agenda aligns with the annual strategic objectives. During assessment alignment is considered, though flexibility is allowed for emergent strategies, particularly when it has to do with donor funds or external collaborations.

The research profile of the University of Ghana is growing. The development of the Intellectual Property Policy will ensure that innovators are encouraged by benefitting from their discoveries and innovations. Innovations are also enhanced by promoting and rewarding the generation and implementation of creative ideas. The universities are also strengthening the capacities of staff in developing fundable research proposals, dissemination of research results, commercialization of inventions and project management. In UPSA, as a policy all research output should include a publication and a policy brief or industry brief. The university uses the number of publications and evaluation reports on policy and industry briefs to access impact. A concept that is now emerging in the university is using the application “Publish or Perish” to judge the impact factor of publications. This is however, not well coordinated though it appears to gaining recognition in the university. The universities are also fostering the development of collaborative projects between Ghanaian universities and other world universities.
3.6.5 Funding for research and innovation
Funding for research remains a serious constraint. Government allocations to research are not adequate. Institutions augment these by competing for research grants and also through joint researchers with other universities. Some universities such as University of Ghana have allocated part of its internally generated funds to set up funding schemes which are accessible to members of the University community for research. Universities have also developed faculty development grants to support staff members in research and attaining higher qualifications. These however are not adequate. Governments and the institutions themselves need to allocate adequate funds for research and innovation. Partnerships and collaborations have also been considered as one viable avenue.

3.7 The role of internationalisation
The education industry is one of the fastest developing sector worldwide, generating large scale revenues and employment. With the effect of globalisation, competition and emergence of knowledge economy, the demand for better education has increased, largely through increased private participation, commoditisation and internationalisation of higher education. In the higher education context, globalisation has been defined by (Knight and De Wit, 1995: cited in Beerkens, 2004:16) as an internationalisation of higher education, thus the process of integrating international dimension into the teaching, research and service functions of higher education institutions. Beyond, the three missions of higher education, the process of internationalisation of higher education has also impacted both on management of higher education systems and institution as well as curricula issues. Social pressures and the specific requirements of the labor market have resulted in an extraordinary diversification in universities and in programmes of study.

According to the Human Development Report (2012), the Global education industry is the second-largest industry after healthcare. It had a market size of ~US$ 3.0 trillion in 2012. In terms of geography, the Universities in the World now generate a large amount for the Global economy. In 2012, more than 3.5 million students enrolled in higher educational institutions outside their home origin, indicating an 8.2% increase of 233,400 students over 2006. The students in tertiary education grew five-fold from 28.6 million in 1970 to
152.5 million in 2007, in contrast to a growth which doubled every 15 years. In contrast the share of tertiary students studying in North America and Western Europe declined from almost 50% in 1970 to 20% in 2007. This indicates the growing popularity of tertiary education in other regions such as Africa, the Arab world and Asia. A UNESCO GED Report, (2009) indicate that substantial progress in has been made smaller economies, such as Bangladesh, Chile, Ghana, Mauritius, Rwanda and Tunisia among a few to mention and this has contributed significantly to the growth of global higher education enrolments. This implies that cross-border education reflected in outbound and inbound mobility has now become a significant aspect of internationalisation of higher education this has been fueled by Online and Distance Learning (ODL) schemes.

The report further indicate that major changes have occurred in recent past in the structure of higher education driven by technology-learning and test preparation market, which has contributed significantly to international education provision and demand in Ghana. With the effect of globalisation and commoditisation of higher education, the demand for better education in Ghana has increased, largely through increased private participation. The E-education and distance education market is a burgeoning segment with high growth potential in the industry in Ghana.

Globally, international student mobility largely reflects a South-North phenomenon. Universities and academic systems themselves have developed many strategies to benefit from the new global environment and attract non-resident students. Some universities in non-English-speaking countries have established degree programs in English to attract students from other countries. Universities have established partnerships with academic institutions in other countries in order to offer degree and different academic programs, develop research projects, and collaborate in a variety of ways. The mobility of international students involves two main trends. One consists of students from Asia entering the major academic systems of North America, Western Europe, and Australia. Countries like the United Kingdom, Australia and Canada have adjusted visa and immigration requirements to attract foreign students, motivated to a significant degree by the desire to maintain economic competitiveness and realize financial gains by enrolling
large numbers of full fee-paying internationals. The other is within the European Union as part of its various programs to encourage student mobility.

The Accra Declaration on the implications of GATS and the Internationalisation of Higher Education in Africa in April 2004 by the Association of African Universities (AAU), UNESCO and the Council on Higher Education (CHE) (South Africa), did not seem to have slowed down the impact of the commoditisation and internationalisation of Higher education on Ghana. On the contrary, the higher education landscape in Ghana had changed dramatically since 2004. With this declaration not only was the flood gate opened for higher education in Ghana but now players, in particular, open and long distance learning became a potent stream (AAU, 2004).

Competition has since been enhanced with key players from US, Europe and lately China either aggressively prospecting students or setting up satellite campuses. However, the critical issues that come with increased competition of higher education in Ghana are issues of quality of cross-border provision and mutual recognition of credits and certificates in Africa and a quality assurance and accreditation systems appropriate for the development of higher education in Africa. What Africa needs to facilitate the internationalisation of higher education are fundamental blocks which include, a harmonized quality Assurance system (AAU, 2013, EU- AUC, 20Q3), and a qualifications framework and an Africa Higher Education Space where information on all recognized and accredited higher education institution can be accessed. Other critical issues affecting intra - Africa out bound mobility are linguistic barriers (Francophone, Anglophone, Lusophone), different credit systems, and the lack of a common quality Assurance and accreditation framework for Africa. Apart from South Africa, a good number of the outbound mobility ends up in the UK or the USA. (UNESCO, 2009)

Research and Innovation is becoming the spearhead of competition – at a regional level, on a national level, and for companies,” (Verwaayen, 2012). In Africa, as there is only limited research income available from universities or national governments. International partnership has become an important ingredient for donor funding. This emphasizes the
need for collaboration, particularly international collaborations. Research Africa report that research funders increasingly require investigators to partner up with colleagues in other institutions, countries or continents. Successful partnerships allow organisations to derive individual benefits while working towards a common goal (Research News Letter, April, 2013).

Challenges in partnerships include differences in language and terminologies, personal and professional cultures, and resources. Another key challenge in international collaborative projects is the fact that there are no guidelines for collaboration and often the lead institutions are left to determine entirely the terms which sometimes undermines trust and commitment. Websites and social media platforms like LinkedIn have become useful tools in searching for international partners. However, face-to-face networking at conferences is vital to cement new bonds. Select partners with care, as you will be sharing intellectual property with them. Exchange and mobility programmes are also of essence, but like the ACP-Intra Africa Mobility Programme, mobility is increasingly being geared towards research and innovation than teaching and learning.

3.8 Future of research and innovation in Ghana Index

The landscape for research has changed over the past few years with the oldest public universities concentrating their efforts on being research-led. To this end, there has been an increased emphasis in graduate enrolment and graduation. Specifically, the University of Ghana believes that increasing enrolment at the graduate level as well as enforcing the requirement of Faculty members to hold PhD or equivalent terminal degrees, research will thrive and continue to grow. These are the foundations of a research university.

The National Policy Dialogue on Tertiary education in Ghana, with the theme: repositioning tertiary education for national development (May, 2013), key issues discussed include, role of tertiary education in national development, differentiation and diversification of the tertiary education, which stressed the need for the establishment of some research universities. Another key issue which dominated much of the discussions was on research and innovation for national development, with particular emphasis on fostering
collaboration between the industry, civil society and training institutions. The Director General of the CSIR, made it clear that the two major challenges are the issues of coordination and collaboration between the research institutions and universities as well as civil society and industry. The second is the lack of funding with larger part of funding for research coming from donors which undermines the ability to tailor research towards planned national development needs.

Collaborations with industry and civil society as well as collaboration among research institutions and tertiary institutions are emphasized to support the development agenda of the country. Additionally science and technology parks and business incubation laboratory have been recommended to translate ideas into technology and market place products or social solutions. Research and Innovation should not be limited to science and technology but also to social interventions and solutions. The science and technology must be linked with social science particularly the management sciences, since the major challenges with STI management in Ghana lies with management and leadership of research and innovation.

A national coordination and systematic planning of research and innovation based on national priorities is also recommended. This calls for re-prioritizing of research and innovation through the improved funding but with a modified funding structure, a structure that is not overly reliant on public funding. This requires that research and innovation must become responsive to market needs. Utilization of public funds for research should be critically re-examined to make it more accountable and transparent by removing away from inefficient practices.

The innovation index framework of the Global innovation index suggests that innovation is influenced directly by the innovation efficiency index which also depends on the innovation inputs and output sub-indices. The innovation input variables are affected by institutions, human capital and research infrastructure, market sophistication, business sophistication and creative outputs. Of particular emphasis is the human capital and research component of innovation which directly depends on education and research and development. Unfortunately this is not well coordinated to feed the development needs of the country.
Research and innovation at both the universities and other tertiary education institutions and the research institutions in Ghana are heavily donor driven and therefore often not systematically planned in line with national development needs for innovation. Ghana has made some significant gains in the innovation index in 2012; however, it appears this is largely due to strides in the business and technology sector. What this suggests is that a stronger collaboration between industry, business and Tertiary education and research institutions could accelerate and sustain the gains made.

National Funding for Science, Technology and in particular Research should be strengthened.

The Mathematics, Science and Technology Scholarship Scheme (MASTESS) which is a key intervention to support Mathematics, science and technology education should be evaluated and reconsidered to it more accountable and effective.

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Ghana


Chapter 4

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Case study Kenya

4.1 Introduction
The production and reproduction of higher education and development policy in sub-Saharan Africa has been heavily influenced by a complex, overlapping, and shifting set of ideologies and paradigms constructed and embedded within the global supra-system. Education policymaking in Kenya has been characterised by dramatic shifts and fluidities as well as puzzling overlaps (Obamba, 2011). Particular policy themes and priorities have emerged at particular historical junctures; only to subsequently decline in significance, disappear, and be replaced by completely different, similar or even conflicting policy priorities. During the last two decades, there has been a widespread and dramatic global shift toward greater emphasis on the importance of knowledge in realizing development objectives and resolving prevailing human problems (OECD 1996; World Bank 2002). The emergence of the global knowledge economy has had a profound but differentiated impact on nearly every economic, political, or social organization on the planet (Castells 2005). As would be expected, a significant part of contemporary education and development policy in Kenya has followed the contours of these overlapping policy regimes.

This study provides a critical analysis of Kenya’s recent education and development policy trajectories based on a comparative analysis of key government policy publications using a chronological and thematic approach. It further draws on the findings from a recent study of Kenya’s higher education sector (Obamba 2011). The paper traces the rise and decline of various policy regimes in post-independent Kenya; traversing the period of the ‘developmental university’, the ‘Privatisation and liberalisation’ regime, through to the more recent ‘marketisation and New Public Management’ and the ‘knowledge for development’ policy regimes. The recent shift to knowledge-oriented development policy with its corresponding heightened emphasis on the Science-Technology-Innovation model
and internationalisation is subjected to critical analysis and interrogation to illuminate the existing potentials, gaps, and capacity deficits associated with Kenya’s current knowledge-based economic aspirations.

4.2 Trends and changes in policy and the roles of the university

This section presents an overview of the main trends and changes in policy and the roles of the university in Kenya.

4.2.1 The Developmental University Regime: 1950s-1970s

The idea of human capital development and its linkages to economic growth had captivated the imagination of sub-Saharan Africa from as early as the 1960s (Samoff and Bidemi 2003). This led to the idea of the ‘developmental university’ becoming the dominant paradigm shaping university education across Africa. Deriving from this developmental ideology of university education, the Kenya government firmly advocated for free university education. Kenya’s first National Development Plan 1964-1970 (Kenya 1964a) attached significant political and economic importance to promoting education and made recommendations for substantial public funding.

The focus of education at independence was on expanding educational opportunities for Kenyans; development and Kenyanization of manpower, and promoting economic and social development through increased investment in education at all levels. In a similar spirit, the Sessional Paper No.10 of 1965 affirmed the economic importance of education. The paper stated that education should be viewed as “much more of an economic than a social service…the principal means of...equalizing economic opportunities for all citizens” (Kenya 1965, p.305). This suggests that education was viewed as an instrument for upward social mobility and social justice.

The next major government policy document that embraced the evolving developmental purposes of the university system in Kenya was the Ominde Education Commission Report (GOK 1964). The proceedings and findings of this pioneering education inquiry commission were significantly influenced by the human capital development theory which had been dominant during the early 1960s (Schultz 1964; Becker 1964). The recommendations of
the *Ominde Report* (Kenya 1964b) and *Sessional Paper No. 10 of 1965* (Kenya 1965) formed the backbone of the government’s broader policy regime on education and development that remained influential throughout the 1960s until early 1980s. The report stated:

> Of all these reflections, perhaps the most urgent in our minds was the need to see education in the context of our national economic development; for upon the adequate fulfillment of this objective, our ability to reach all other national goals, including those in education, depends....Thus, the closer the link between our efforts in education and the ends of national development, the better for both education and development (Kenya 1964b: 24)

The third *National Development Plan 1974-78* (Kenya 1974) illustrated continuity with the government’s well established policy of increased higher public funding and expansion of educational opportunities for all Kenyans, especially in the university sector to develop the high level manpower required to meet the economic needs of the country. However, the 1974 Plan also represented a policy departure in two important and surprising aspects. First, it emphasized that the beneficiaries of higher education should be made to bear at least part of the costs of their university education. Secondly and most significantly, it became the very first public document in Kenya to draw attention to the escalating public costs of education and the need to reduce public expenditure on higher education. The *National Development Plan 1974* adopted the following economic argument:

> Because university education equips those who receive it for highly paid jobs; the government proposes that university students should contribute to a significant extent to the cost of their own education. For this reason students will be given loans rather than grants to pay for their fees and other expenses (Kenya 1974, p.13).

This school of thought partly explains why the government immediately enacted the *Higher Education Loans Fund Act (1974)*; which resulted in the establishment of *University Student Loan Scheme*. However, the HELF Act 1974 represented no significant policy shift regarding the costs and funding mechanisms of higher education; since university students still paid no tuition fees as the student loan scheme only covered the students’ accommodation and miscellaneous expenses. The 1974 Development Plan, despite decrying the rising costs, still reaffirmed the continuation of free university education. The document stated that “the
principle of free tuition will be maintained; the loan scheme will apply to personal allowances and accommodation” (Kenya 1974a, p.72).

Unsurprisingly, the study loan scheme was viewed primarily as a free study grant; because every university student got the maximum amount and the public believed that university education was free (World Bank 1995). Clearly, the combined weight of human capital arguments and the developmental university paradigm exerted significant influence on government policy. This staggering egalitarian regime of free tuition would be decisively shattered in 1991 following the implementation of the World Bank’s the Education Sector Adjustment Credit (World Bank 1991).

4.2.2 Privatisation and liberalisation: 1980-1990
The policy landscape that emerged in Kenya’s higher education during the 1980s and 1990s can be categorized as the Privatisation and liberalisation regime. This phase may be defined as the period when the government of Kenya introduced a policy framework that aimed to liberalise the higher education sector and promote the development of private universities. This goal was achieved through the enactment of Universities Act 1985 which provided the overarching policy framework for private universities in Kenya for the first time. The period is further characterised by key policy instruments and discourses that aimed to ‘privatize’ the public universities by introducing cost-recovery and cost-sharing mechanisms.

The Privatisation of public universities also manifested itself in the unprecedented government initiative to liberalise the public universities by allowing privately-sponsored students to be admitted into public universities alongside the traditional government-sponsored students. The policy on cost-sharing and Privatisation was strongly suggested in both the Mackay Report (1982) and Sessional Paper No. 6 of 1988. At the wider sub-Saharan Africa level, this phase coincided with and was deeply shaped by the period when higher education underwent marginalization in terms of funding and political support at international and national circles (World Bank 1991; 1988).

The shift to Privatisation and liberalisation regime was driven by a complex combination of internal and external forces which precipitated a period defined by substantial structural
and systemic crisis in Kenya’s university sector. The internal factors were chiefly connected to the unprecedented macroeconomic meltdown that engulfed Kenya during 1970s and 1980s. The economic crisis was characterised by rising budget deficits, worsening recurrent public expenditure levels, escalating inflationary pressures, and declining GDP growth in real terms (Swamy, 1994; World Bank 1995). This adverse and structurally distorted macroeconomic scenario formed the backdrop against which Kenya was forced to apply for the first IMF grant under the Enhanced Structural Adjustment Facility in 1979 to support unprecedented macroeconomic and fiscal stabilization restructuring in various sectors (World Bank 1994).

The structural adjustment lending to the education sector was known as Education Sector Adjustment Credit (EdSAC); whereas another lending instrument called the Kenya Universities Investment Project targeted universities specifically. Both were implemented in 1991, a move that dramatically sucked the higher education sector into the eye of the storm in terms of intense pressure and radical conditionalities for structural reforms (World Bank 1991). The period following the implementation of the EDSAC in 1991 would be marked by intense and rapid policymaking activity in Kenya. The second dimension of the university crisis was the unprecedented escalation of demand for higher education and the explosive expansion of university enrolments during the 1980s and 1990s. As a result of the ‘double-intake’ policy, total enrolment in public universities escalated from 9000 to a staggering 41000 between 1986 and 1991; whereas the number of public universities grew from two to only six during the same period (Kenya, 1991).

4.2.2.1: In the Eye of the Storm
The 1980s and 1990s marked a complex and highly turbulent juncture in Kenya’s higher education policy landscape. These were in response to the domestic economic crisis and the intense pressure exerted by the Bretton Woods multilateral donors through the EDSAC and the Universities Investment Program (World Bank 1991). The first and most significant legislation during this period was the Universities Act 1985. This Act was important because it provided the legal and policy framework for the establishment of private universities in Kenya and also legislated the setting up of the Commission for Higher Education. The fundamental purpose of the Commission was to coordinate the planning and development
of higher education in Kenya (Kenya 1985, p.4). A significant number of key policy instruments were also pronounced during the same period to help create a comprehensive policy framework for Privatisation and liberalisation.

In 1988, the Government issued Seasonal Paper of 1988 on Education and Manpower Development (Kenya 1988). This policy document was a direct creature of the recommendations of the Kamunge Education Commission which had published its report in 1988; but it was also significantly influenced by the demands of another radical World Bank policy paper issued in 1988 which demanded radical reforms in the funding and management of university education in Sub-Saharan Africa (World Bank 1988).

The Kamunge Report 1988 made firm recommendations for the introduction of the cost-sharing policy in public higher education. This recommendation was based on the argument that the public costs of providing free university education had escalated significantly and it was economically prudent to transfer a larger part of these direct costs to the students who were seen as the actual beneficiaries of university education. The 1988 Sessional Paper explains that “the government welcomes the current practice of cost-sharing in the financing of education between the government, the communities, parents and private organisations” (GOK 1988, p.50). The cost-sharing approach describes a financing model where students are required to cover the full or partial costs of their tuition, accommodation and living expenses that were previously funded fully by the taxpayer. The cost-sharing phenomenon was not entirely new in Kenya’s policy landscape.

The rising costs of education and the need for the cost-sharing approach had long been discussed in Kenya in the 1970s in the Third Development Plan 1974 (Kenya 1974a, p. 431), which had resulted in the enactment of the Students Loans Fund Act 1974(Kenya 1974b). Again, in 1982, the MacKay Presidential Working Party Report had also strongly suggested that university students should be made to pay for costs of their education (Kenya 1982, p.32). The 1986 Sessional Paper on Economic Management for Renewed Growth resolved to implement measures to reduce public expenditure on education to approximately 30 per cent of national recurrent budget (Kenya 1986). The 1986 Paper also specifically recommended ‘the desirability of increasing fees’ at the public universities (Kenya 1986, p. 431).
The 1988 Sessional Paper was therefore issued at a time of intense economic pressure hence its overwhelming focus was to reduce recurrent public expenditure universities and enforce cost-sharing:

_The government is concerned about the rising cost of education and the constraints it has caused the government in its ability to provide adequate financing to other sectors of the economy. In view of this the government has decided, as stated in Sessional Paper No 1 of 1986, to reduce the expenditure on formal education and training to about 30 per cent of the national recurrent budget. The Government intends to achieve this through increased cost-sharing in the financing of education and training_ (Kenya 1988, p.50).

Although the 1988 Sessional Paper did not in itself directly demand the introduction of direct tuition fees in universities, it however represents a significant step towards that goal by stating that ‘universities should establish ways and means of generating funds from the private and public sectors’ (Kenya 1988, p.30). The paper further stated that the government will “encourage the admission of self-sponsored students in public universities” to ensure cost-effectiveness and optimum utilization of scarce resources and facilities (p.32). These two key policy resolutions indirectly for grounded the enforcement of direct tuition fees in all public universities in 1991 as well as the emergence of privately-sponsored programs in public universities since 1998, both of which represented major features of the emerging Privatisation and commercialization of higher education in Kenya.

### 4.2.3 Marketisation and New Managerialism: 1990-2005

The period between 1990 and 2005 in Kenya’s education policy history can be described as the era of neoliberal Marketisation and New Public Management. In many ways, this new regime represents a period whereby some of the key characteristics that marked the preceding Privatisation and liberalisation regime now became more intense, widespread, and institutionalized. The key feature defining this period is the entrenchment of neoliberal market-oriented operations in higher education through government policy instruments that emphasized direct tuition fees payments, enrolments of privately-sponsored students in public institutions, and income diversification through commercialization. The second element in this new regime was the increased emphasis on economic efficiency and new
approaches to public management and governance in higher education as well as in the public sector generally.

A policy blueprint of particular significance with respect to public governance transformation in Kenya is the Economic Recovery Strategy for Wealth and Employment Creation ERSWEC 2003-2007 (Kenya, 2003). The ERSWEC emphasized and articulated the principles of public accountability, transparency, efficiency, cost-effectiveness, and performance measurement in the delivery of public services. The blueprint went further and operationalised the enforcement of these new policy technologies into the entire public sector in Kenya through the instrument of *Legal Notice No. 93 on Performance Contracting* issued in 2004 (Kenya 2004). One of the most significant instruments that shaped the *Marketisation and New Public Management regime* and which embodied the World Bank’s relentless influence in policy engineering in Kenya was the implementation of World Bank’s Education Sector Adjustment Program of 1991.

### 4.2.3.1 Education Sector Adjustment Credit

The macroeconomic and sectoral crisis examined above provided the context that forced the government of Kenya to request for sectoral adjustment credit financing from the World Bank to rescue the education sector from collapse, particularly the university sector. In 1991, the World Bank approved the disbursement of the *Education Sector Adjustment Credit* (EDSAC) worth US$ 203 million to support one of the most audacious restructuring programs of Kenya’s entire education sector. At the same time, the International Development Association also approved a parallel bilateral credit package known as the *Universities Investment Program* (UIP) valued at SDR 41 million to implement the revitalization and radical adjustment of Kenya’s public universities that were on the grip of an unprecedented financial crisis (World Bank 1995).

The EDSAC pursued four major objectives for the entire education sector: First, to reduce the rate of increase of public recurrent expenditure on education; second, to expand access to education; third, to enhance quality and relevance of education at all levels; and fourth, to strengthen the capacity for education sector management, planning, policy, and information systems (World Bank 1995). With specific reference to the higher education
subsector, the EDSAC instrument was attached to specific structural and policy conditions: limiting the rate of increase in the total number of undergraduate enrolments at less than 3 per cent per annum in all public universities; introduction of direct tuition charge for all students; the restructuring of student loan scheme; and fundamental restructuring and strengthening of the Commission for Higher Education to make it more effective in discharging its mandate.

The *Universities Investment Project* spelt out a separate set of additional conditionalities that universities and the government had to comply with. Schedule II of the UIP credit instrument defines two tough conditionalities: reducing the rate of increase of public expenditure in higher education through cost sharing and efficient investment planning; rationalization and strengthening of the institutional framework of the university subsector; and improving the quality of education and research in public universities (World Bank 1991, p.9).

It is important to recognize that these conditionalities and policy guidelines were largely based on recommendations drawn from a set of radical World Bank policy published during the time (World Bank 1986; 1988; 1994). These reforms triggered an unprecedented restructuring of the organizational and policy landscape of higher education in Kenya within a relatively short time. It is intriguing to recognize that within a space of less than 5 years, the World Bank deployed its immense financial and geopolitical instruments through EdSAC and UNIP to accomplish one of the most unprecedented and radical restructuring programs that the government of Kenya had failed to achieve on its own in more than two decades of ‘home-grown’ policymaking.

**4.2.3.2 Changing role of the state in management and funding**

In the face of tightening donor conditionalities, chronic macroeconomic instability, rising public expenditure, and growing budget deficits, the Government of Kenya became more determined to chart a new trajectory of fiscal austerity and radical structural adjustment to steer the country towards economic growth and stability. The hallmark of government policy was to ensure public expenditure reduction and budget deficit rationalization. The education sector, especially, higher education, became a major focus of government
financial austerity measures in compliance with the conditionalities attached to World Bank Credit facilities discussed above. The 1990s decade kicked off with the release of the government’s *National Development Plan 1994-98* (Kenya 1994). This economic blueprint elaborated the key elements of the government’s new economic policy paradigm marked by radical public expenditure reductions, liberalisation and Privatisation, and the application of market instruments in public service delivery and management. The *Plan* outlined this new policy regime in no uncertain terms:

*The central thrust of the new policies is to rely on market forces to mobilize resources for growth and development with the role of the government increasingly confined to providing an effective regulatory framework and essential public infrastructure and social services. The government will limit direct participation in many sectors and instead promote private sector activity* (*Development Plan 1994-1998*).

However, even before the *Development Plan 1994-1998* could run its full course of implementation, the government came under renewed external pressure from the World Bank to clearly define and operationalize a more comprehensive strategy for tackling macroeconomic adjustment and growth as part of the conditions attached to the on-going World Bank-engineered Sectoral Adjustment Lending programs. The government had no alternative but to comply by issuing *The Policy Framework Paper for Economic Reform 1996-1998*; which was authored by the government of Kenya but curiously with significant input from the IMF and the World Bank (Kenya 1996). This economic policy blueprint laid major emphasis on three key trajectories: market liberalisation, Privatisation, and decentralization. With regard to education the papers states: “The government has given clear priority to education and health; and has taken pragmatic approaches in respect to private provision of these services” (ibid. p.5). The 1996 policy paper emphasized that:

*Consistent with the decentralization strategy, determination of fees to supplement government grants to meet especially the actual costs of tuition, accommodation and catering will be fully devolved to the individual university Councils from the academic year 1996/1997* (Kenya 1996, p.37).

The Paper elaborates on the government’s new Privatisation and liberalisation agenda:
The government considers the private sector as the only basis for sustainable long-term economic growth. Accordingly, the government intends to move further away from direct involvement in economic activity through rationalisation of the public sector firms and an accelerated program of Privatisation (Kenya 1996, p.17)

The evolving direction of government policy was that public universities were required to develop alternative strategies of generating supplementary income and reduce their dependency on government subsidies. This was part of the policy to reduce public expenditure on education and rationalize the mounting budget deficit. The evolving policy regime strongly emphasized Privatisation, Marketisation, private financial diversification, and entrepreneurialism at the universities and has been entrenched by a significant corpus of government documents since the 1990s (Kiamba 2004, p. 55). This new dominated policy paradigm was firmly articulated in the Government’s Master Plan on Education 1997-2010 (Kenya, 1998). The Plan states that:

Universities will be encouraged to develop non-public sources of their revenues, including income-generating activities (such as returns from research and consultancies with industry and employers, services to the community, agro-based production, manufacturing for the market, including making equipment for use in schools, hiring out university facilities); grants and donations from NGOs and well-wishers; and funding from alumni (Kenya, p. 110).

The next significant document on education policy was the Sessional Paper No 1 of 2005 on Education, Training & Research (Kenya 2005a). This is the second Sessional paper on the education sector since the Sessional Paper No. 6 was published back in 1988; and since the Master Plan on Education was released in 1998. The paper represents a reproduction and elaboration of the dominant policy regime of Marketisation and Privatisation.

The Sessional Paper however represents a policy shift from the two preceding blueprints since it manifests the emergence of completely new strands of policy priorities and discourses within Kenya’s higher education. These emergent discourses include ‘global competitiveness’, ‘demand-driven’, ‘democratic management’, and ‘responsiveness to the market’. The 2005 Paper characterizes the type of education Kenya is seeking to create:
It [the policy] will also lead to the development of a diversified financial base and provide a maximum degree of managerial independence; while at the same time paying attention to the issues of relevance, and responsiveness to the market and to national priorities...university education will therefore need to be demand-driven, high quality, gender sensitive, technologically informed, research supported, democratically managed, and globally marketable (Kenya 2005a, p.47)

The next policy instrument is the Kenya Education Sector Support Program (KESSP) 2005-2010 (GOK 2005b); which represents a sector-wide investment program funded jointly by Kenya government and the World Bank. The KESSP is a creature of Sessional Paper No. 1 of 2005 mentioned above; however, it also fits within the framework of the government’s new Economic Recovery Strategy 2003-07 (Kenya 2003). The KESSP represents a paradigm shift towards a more intense focus on market-oriented coordination and financial diversification in higher education; further Privatisation and public-private partnerships; increasing recognition of the international context of higher education, and an emphasis on autonomy and decentralized governance.

One of the most significant elements contained in the KESSP is the renewed focus on the importance of the market instrument for coordinating and delivering quality university education. For instance, under its key investment priorities in the university sector, the KESSP aims to ‘review existing programs with a view to addressing relevance and market demands’ (p. 260).In continuity with the Sessional Paper of 2005 the KESSP also emphasizes that education in Kenya should be ‘demand-driven’ and ‘globally marketable’, priorities which denote increasing international and market consciousness (Kenya 2005b, p.256).The KESSP blueprint signifies the back-end of the period characterised as that of neoliberal Marketisation and new public management in Kenya. The next set of policy blueprints represents a radically different but overlapping layer of policy narratives and priorities which can be described as the knowledge and development regime.

4.2.4 Knowledge for Development Management
The basic notion that higher education is an important tool for creating skilled manpower for is neither uncommon nor unfamiliar within the large body of education and development policy documents produced in Kenya since independence. For many decades,
however, there has been neither coherent public debate, nor a clear policy blueprint articulating the actual nature, scope, and significance of the interrelationships between higher education and national development priorities or processes. Over the recent few years since 2006, however, the landscape of education and development policy in Kenya has shifted dramatically toward what can reasonably be characterised as the emergence of knowledge-based development policy regime in development planning. This policy regime is characterised by a more articulate discussion of the connections between knowledge, higher education, and sustainable development and is embodied in a series of key policy documents. At least in theory, this emerging regime is defined by an emphasis on the following set of priorities: Science Technology and Innovation (STI); knowledge-driven development management, higher education partnerships, and university-industry linkages.

4.2.4.1 Footprints of STI Regime
The emergence of the Science-Technology-Innovation paradigm in Kenya’s recent higher education and development policy discourse is completely unprecedented and almost out of character. However, the roots of this sudden commitment to STI rhetoric can be traced to the broader global policy landscape. The idea of ‘innovation system’ was first defined in a major OECD report which articulated its conceptual foundations (OECD 1997). A decade after the seminal OECD’s Innovation Systems report (OECD 1997), the World Bank also convened its own Global Forum on Science, Technology, and Innovation (STI) in Washington in 2007. The purpose of this watershed Forum was “to discuss strategies, programs, and policies for building science, technology, and innovation (STI) capacity to promote sustainable growth and poverty reduction in developing countries” (World Bank 2007, p.1). It is not insignificant to recognize that the Kenya Vision 2030 blueprint (Kenya 2007a), with its unprecedented focus on STI and knowledge, was formulated shortly after this World Bank Global Forum which was also attended by senior delegations from the Kenya government (Obamba, 2013). The analysis of Vision 2030 and a host of other recent policy blueprints presented in the next sections will suggest that these documents have been shaped by the dominant principles and thinking that were part of the resolutions at the World Bank STI Forum.
The genesis of what has become the current intense policy discussion regarding Science Technology and Innovation and the linkages between knowledge, economic productivity, and sustainable development is demonstrated in two recent reports commissioned by the Government of Kenya: Public Universities Inspection Board (PUIB) Report (Kenya, 2006) and the Task Force on National Education Strategy Report (Wandiga Task Force) (Kenya, 2007). The PUIB Report called for a new knowledge-based economic dispensation in Kenya and forcefully articulated the role of universities and knowledge as vital instruments for rapid economic growth and sustainable development. The report also captured the knowledge-development agenda within the context of university entrepreneurialism (Clark 1998) and recommended “the transformation of universities into entrepreneurial and developmental universities by enriching the practical orientation of academic programs and through linkages with industry and other productive sectors of the national economy” (Kenya 2006). In seeking to re-align universities to the developmental purpose, the report asserts further that “the critical role of utilizing university education to address the national agenda of poverty eradication should be inculcated in university programs, and be enshrined in their vision” (ibid). The Report provides by far the first and clearest articulation of the knowledge-development link and the role of universities in Kenya’s development policy history. It states:

A major contribution of university education to national development is through conducting research and ensuring the utilization of research findings to improve certain crucial areas of economic development. Kenya in particular needs research to enhance food security and deal with emerging diseases such as HIV/AIDS (p. 303).

The Wandiga Task Force also produced a highly detailed and comprehensive report (Kenya 2007a). Borrowing substantially from the PUIB Report in terms of membership and mandate, the Wandiga Task Force distilled a wide range of fundamental policy questions and defined a completely new vision and trajectory for Kenya’s higher education and development policy. The significant features that characterize both PUIB Report and Wandiga Report are their common emphasis on the importance of Science Technology and Innovation (STI) capacity for economic development, the power of the knowledge economy, and the development of university-industry linkages to stimulate university-driven innovation and entrepreneurialism. These two reports therefore demonstrate a
profound and unprecedented synthesis of the phenomenon of knowledge-based economic thinking and the use of knowledge to promote economic growth, poverty reduction, and sustainable development in the widest sense. The Wandiga Report also articulates the developmental role of knowledge:

*In Kenya, the ability to use knowledge could dramatically raise agricultural productivity, reduce disease burden, protect the environment, add value to local resources and the tourism sector, by embedding knowledge and culture into tourism products, and establish Kenya as a hub for financial services* (Kenya 2007, p.18).

Whereas the *PUIB* and the *Wandiga Task Force* reports do not necessarily constitute government policy in their current forms, it is particularly significant nevertheless to recognize that the two reports have had a tremendous influence on recent public policy and practice with respect to education and economic development in Kenya. A large proportion of the new radical insights and innovative policy recommendations they articulate have since been embedded in a number of major recent policy instruments and are shaping Kenya’s development policy and discourse in profound and unprecedented ways.

### 4.2.4.2 National Innovation Policy Framework

A large and growing body of major recent policy blueprints in Kenya appears unanimous that science technology and innovation provides immense scope and opportunities for promoting rapid economic growth, stimulating productivity, and improving people’s livelihoods. This section provides a critical review of selected key policy documents that are defining the prevailing landscape of Kenya’s new STI-based development management framework. The most important instrument is the *Kenya Vision 2030* (Kenya 2007b), which is the country’s current national development blueprint. Other major recent papers to be examined include the *Strategic Plan of the Ministry Higher Education Science and Technology* (Kenya 2008), the *National Science, Technology and Innovation Policy and Strategy* (Kenya, 2009); *Science, Technology and Innovation (STI) Bill* (Kenya, 2010a), and the *Research Technology and Innovation Sector Report* (Kenya 2010b). Thereafter, this section will also examine the scope and character of Kenya’s evolving national innovation
system and provide an assessment of its strengths and deficits. Key institutional actors within the research and innovation sector will be identified and critically analyzed.

The idea of a national innovation System articulated in the two reports form the backbone of Vision 2030, Kenya's current national development blueprint (Kenya 2007b). One of the several radical features of the Vision 2030 is that it strongly emphasizes the importance of building local capacity for Science, Technology and Innovation and integrating knowledge production into the overall national development strategy in order to achieve rapid economic growth, poverty reduction, and Millennium Development Goals. Compared to all previous development plans in Kenya since independence, the Kenya Vision 2030 demonstrates the clearest awareness of the vital linkages between knowledge and economic growth and defines a bold and comprehensive framework aimed at transforming Kenya from a primary factor-based economy to a “globally competitive” knowledge-based economy (Kenya, 2007a). The Kenya Vision 2030 declares that the agenda for transforming the trajectory of Kenya's economic and social development will be anchored on the intensive development and application of science technology and innovation capacities through a national innovation System that cuts across all sectors of the Kenyan economy (Kenya 2007). Higher education is portrayed as playing a vital role in this new knowledge-intensive economic landscape:

*A pool of relevant and adequate skills must be available for absorption into the economy. However, for technology deepening to occur within the general society it is crucial to translate these skills into productive competencies engaged within industry. Therefore the higher education training and research system must be proactive in addressing the needs of industry to ensure effective synergy* (Kenya 2007b, p.5)

The Vision 2030 continues to elaborate the redefined focus on stimulating dynamic linkages and synergies between universities and industry:

*In order for Kenya to realize the maximum benefits of research [and training] there is need to adopt a systems approach to address innovation dynamism in all sectors of the economy by examining interdependencies, interconnections, and interrelations. The current system does not encourage access, use, generation, and diffusion of knowledge within business systems.* (Kenya 2007b, p.24)
The same ideas of knowledge and innovation systems have been embodied in other key recent instruments. In particular, the Strategic Plan of the Ministry Higher Education Science and Technology (Kenya 2008), the National Science, Technology and Innovation Policy and Strategy (Kenya, 2009); and Science, Technology and Innovation Bill (Kenya, 2010), and Universities Bill (2010c) represent a new body of policy instruments that articulate a radical emphasis on a knowledge-based economic order and demonstrate the growing importance of science technology and innovation capacity for national development. The MOHEST Strategic Plan 2008-2012 (Kenya 2008), for instance, affirms that “Kenya intends to become a knowledge-based economy, wherein the creation and use of knowledge will be among the most critical factors for rapid economic growth” (ibid., p. 1). The Science Technology Innovation Bill (2010) captures this idea and provides for “the promotion and coordination of technology acquisition, adaptation, and diffusion into national development processes; and the development of mechanisms for the promotion and utilization of innovations in the country” (Kenya 2010, p. ii).

In 2009 the Government of Kenya undertook to enshrine STI into its development and education policy by formulating the National Science, Technology and Innovation Policy and Strategy (Kenya, 2009). This blueprint demonstrates the most comprehensive articulation of Kenya’s emerging STI approach to economic development management as well as education. Developed by the Ministry of Higher Education Science and Technology, the ground-breaking STI Strategy paper provides the over-arching policy and programmatic framework for strengthening STI development and application in Kenya’s education system and economic development planning. Apart from introducing and defining the phenomenon of a dynamic Kenya National Innovation System, the Strategy further outlines a range of policy guidelines, institutional arrangements, and strategic programs that are aimed directly at strengthening the capacity for the creation, diffusion, and application of STI to promote sustained economic growth, productivity, and poverty reduction in Kenya in accordance with Vision 2030. The government defines a national innovation system as a close network of firms, universities, communities, NGOs, and enterprises which are engaged in various activities to acquire, exploit, diffuse, adapt, and translate knowledge, technologies, products and processes to promote increased economic productivity and

Apart from providing a comprehensive policy and institutional framework for the governance of STI initiatives in Kenya, the STI Strategy also focuses on a range of related initiatives aimed at strengthening the capacity of universities and intermediate research agencies to undertake collaborative and multidisciplinary research. Crucially, the Strategy also aims to promote and strengthen education in science, engineering and technology subjects in Kenyan universities and colleges to ensure a steady production of scientifically qualified workforce. To achieve these goals, the STI Strategy Paper undertakes to: (i) reinforce its commitment to transformational research aimed at generating new ideas and putting into perspective those already developed to address Kenya’s strategic development priorities; (ii) provide increased funding to universities and intermediate institutes to promote research capacity and stimulate research activity, and (iii) promote appropriate science, engineering and technology (SET) skills at various levels through the STI Training Assessment Project and STI Curriculum Review in all Kenyan universities (Kenya 2009, pp.34-35, 65-66). The Strategy further commits to “promote regional and international cooperation and collaboration in science, technology and innovation specifically targeted towards achieving the goals of international relations, national development and security” (ibid, p.35). This commitment is particularly significant as it demonstrates the mainstreaming of internationalisation in Kenya’s education and development policy. There is no doubt that the STI Paper is clearly an unprecedented policy document; however, one of its most serious limitations is the glaring absence of any financial budgetary details or logical operational framework for implementation despite the obvious significant financial implications and the operational complexity of Strategy.

4.2.4.3 Recent Institutional and Policy Thickening

The policy blueprints and programs discussed above represent the immense efforts by the Kenya Government to nurture a vibrant policy environment for the mainstreaming of STI into the country’s national development agenda. An important dimension of the increasing
institutionalization of STI is the establishment of the National Economic and Social Council (NESC) within the Office of the President to provide an integrated think-tank with the mandate and resources to strengthen the development, coordination, mainstreaming, and implementation of government policy and programs on Science Technology and Innovation for enhanced economic growth, international competitiveness, and achieving the Millennium Development Goals (NESC, 2008). Another similar institutional development is the National Council for Science and Technology (NCST). Although established back in 1977, the NCST has recently been radically strengthened to undertake the critical mandate of coordinating, supporting, and promoting scientific research and the production and diffusion of knowledge for sustainable development. The mission of the NCST is “to effectively co-ordinate research, promote and provide evidence based policy advice on matters of Science, Technology and Innovation in Kenya for national social-economic development” (NCST 2009, p.5). The NCST’s current Strategic Plan provides a detailed outline of the Council’s core objectives: promoting innovation in priority growth sectors; strengthening STI performance management framework; mobilizing resources to ensure effective implementation of the government’s STI programs; and enhancing STI awareness among key stakeholders (NCST 2009).

However, the most significant indicator of the Kenya Government’s commitment to the mainstreaming of STI and knowledge in its development management is embodied in the establishment of the Research Innovation and Technology (RIT) sector during the 2008/09 Financial Year (Kenya 2010). This unprecedented move implies that RIT is now recognized as a fully-fledged sector of the economy equipped with funding commitments as well as a coherent policy framework and programmatic mandate to spearhead the STI agenda. Unlike the STI Strategy paper (Kenya 2009), the RIT Sector document provides a detailed financial statement of costs and expenditures associated with each of the several strategic programs within the sector. The core aim of RIT Sector is to facilitate the process of acquiring new knowledge in a systematic manner in order to produce and improve products and processes by focusing on four strategic objectives (Kenya 2010, p.1):

(i) Provide economic and institutional systems with incentives for efficient use of existing knowledge, new knowledge creation, and entrepreneurship;
(ii) Develop an educated and skilled population that can create share and use knowledge effectively;

(iii) Develop a dynamic information and communication infrastructure (ICT) that facilitates collection, processing, storage, retrieval and dissemination of information; and,

(iv) Establish centers of excellence that tap into the growing stock of global knowledge, assimilate and adapt to local needs, while furthering new knowledge and technologies.

The *Research Innovation & Technology Sector* consists of Ministry of Higher Education Science and Technology (MoHEST) which embraces all seven public universities; Ministry of Information and Communications (MOIC); and the five major research-based Directorates. It also encompasses a broad constellation of 10 publicly-funded research institutes. A recent report shows that during FY 2009/10 the Sector was allocated approximately KSh35 billion for recurrent and development expenditures whereas during 2011/2012 a total of KSh 44.2 Billion was disbursed. The sector also received external funding from development partners, amounting to a total of over KSh 4 Billion in 2009/2010, for example. This brief review of Kenya's current policy landscape on knowledge-based economic and education planning clearly demonstrates that there is no shortage of ambitious and highly well-articulated policy guidelines on the need for a knowledge-oriented approach to development. It is still too early to draw any conclusions regarding the Kenya Government’s commitment and capacity to implement these strategic actions plans focusing on STI and knowledge-based development management. In the next section we explore the characteristics of Kenya's national research system in terms of its scope, actors, and capacities.

**4.2.4.4 Kenya’s Research System: Actors, Boundaries, Capacities**

As noted in the discussions above the concept of a national innovation system has become the core priority of Kenya’s recent development policy and discourse. Significantly, Kenya is one of the 19 African countries participating in the *African Science and Technology Innovation Indicators* (ASTII) initiative that is coordinated under the New Partnership for Africa’s Development (NEPAD 2005). The aim of the SIDA-funded ASTII Program is to build the human and institutional capacities required to produce common internationally comparable indicators as tools for research and innovation at surveys at national levels (Kenya 2012, p.1). A national innovation system is understood as a close network of firms, universities, communities, NGOs, and enterprises which are engaged in diverse activities to
acquire, exploit, diffuse, adapt, and translate knowledge, technologies, products and processes to promote increased economic productivity and growth (OECD 1997; Edquist 2001). The innovation system also consists of the policy frameworks and interrelationships that shape the flow of knowledge and activities among the diverse actors within the system (OECD 1997). According to the STI Strategy (Kenya 2009) Kenya’s National Innovation System consists of four dynamic and interacting components: Research and Education System, Business System, Intermediate Organizations, and Framework Conditions.

Kenya’s national research and innovation system encompasses six categories of key actors: (i) two government ministries, (ii) six research-oriented governmental Directorates; (iii) ten publicly-funded research institutes; (iv) Seven public universities and 26 private universities; (v) seven locally-based international research organizations, and (iv) business enterprises of various sizes. This configuration demonstrates that Kenya has an increasingly diverse and vibrant research and innovation landscape that is embedded within an increasingly coherent policy framework. Basically, the two Ministries mentioned above represent the overarching ‘framework conditions’ within which Kenya’s National innovation System is embedded. Two additional specialized government agencies have also been established to play a catalytic and coordinating role within overall policy framework of the National Innovation System. These are the National Council for Science and Technology (established 1977) and the National Economic and Social Council (launched 2007). These five key directorates include the Directorate of Resource Surveys and Remote Sensing (DRSRS), Directorate of E-government (E-GOVT), Government Information and Technology Services (GITS), Integrated Population Registration System (IPRS), and Kenya National Bureau of Statistics (KNBS). These research-oriented directorates within the government provide vital research capacities and synergies to support specific domains of the Kenya government’s own independent research requirements and development agenda. They represent growing and unprecedented tendency for knowledge production and consumption within the Kenya government.

The publicly-funded research institutes are of three main types. The first category constitutes medical-biological sciences research. The medical research landscape is dominated by the flagship Kenya Medical Research Institute (KEMRI) which has
international recognition for its advanced research and innovation across a wide range of medical fields. The National Museums of Kenya (NMK) also has a strong reputation in botany, zoology, biodiversity, and earth sciences research. Between 2000 and 2010, scientists affiliated to the NMK produced an impressive body of 524 scientific papers (INASP, 2012, p.17). The second category encompasses research on agricultural and natural resources. This segment consists of the largest number of specialist research institutes focusing on particular crops and natural resources, reflecting the fundamental importance of agriculture and natural to the Kenyan economy. These include the giant Kenya Agricultural Research Institute (KARI) as well as the relatively smaller agencies such as Coffee Research Foundation (CRF), Kenya Forestry Research Institute (KEFRI); Kenya Sugar Research Foundation (KESREF), Tea Research Foundation of Kenya (TRFK); Kenya Marine and Fisheries Research Institute (KMFRI). The third set of institutes is concerned with research in the social, economic and industrial sciences. This domain is covered by the Kenya Institute of Public Policy Research and Analysis (KIPPRA), Kenya Industrial Research and Development Institute (KIRDI); Institute of Policy Analysis and Research (IPAR), and National Crime Research Centre (NCRC). The country’s research system is further diversified and strengthened by the presence of at least six prominent international research organisations. These include International Centre for insect Physiology and Ecology, International Potato Centre, International Crops Research Institute for Semi-Arid Tropics (ICRISAT), International Livestock Research Institute (ILRI), World Agro-Forestry Centre (ICRAF), and Centre for Disease Control (CDC). This expansive and diversified institutional landscape provides an indication of the growing complexity and significance of Kenya’s evolving national Research Innovation and Technology system. The table below identifies some of the prominent actors that constitute Kenya’s national research system.

Table 1: The key components and actors in Kenya’s Research and Innovation System

<table>
<thead>
<tr>
<th>System Category</th>
<th>Key System Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Ministries</td>
<td>• Higher Education Science and Technology</td>
</tr>
<tr>
<td></td>
<td>• Information and Communications</td>
</tr>
</tbody>
</table>
### Universities
- University of Nairobi
- Moi University
- Kenyatta University
- Egerton University
- Jomo Kenyatta University of Technology
- Masinde Muliro University
- Maseno University
- 26 private universities

### Public Research Institutes
- Kenya Agricultural Research Institute (KARI)
- Coffee Research Foundation (CRF)
- Kenya Forestry Research Institute (KEFRI)
- Kenya Medical Research Institute (KEMRI)
- Kenya Sugar Research Foundation (KESREF)
- Kenya Marine & Fisheries Research Institute (KMFRI)
- Tea Research Foundation of Kenya (TRFK)
- Kenya Institute of Public Policy Research and Analysis
- Kenya Industrial Research and Development Institute
- National Crime Research Centre (NCRC)

### Government Directorates
- Department of Resource Surveys and Remote Sensing
- Directorate of E-government (E-GOVT)
- Government Information and Technology Services
- Integrated Population Registration System (IPRS)
- Kenya National Bureau of Statistics (KNBS)
- National Museums of Kenya

### International Research Agencies
- International Centre for Insect Physiology and Ecology
- International Potato Centre
- International Crops Research Institute for Semi-Arid Tropics (ICRISAT)
- International Livestock Research Institute (ILRI)
- World Agro-Forestry Centre (ICRAF)
- Centre for Disease Control (CDC)

Source: Research Innovation and Technology Sector Paper (Kenya 2010)

### 4.2.4.5 The shape and size of Kenyan Science
The national research profile outlined above suggests that Kenya has a relatively impressive knowledge production infrastructure by regional standards and is rated among one of the more competitive research systems in Africa (Tijssen 2007). The OECD *Frascati*
Manual identifies human resource capacity is one of the core international indicators for national research and innovation competitiveness (OECD 2002; 2005). The recent African Innovation Outlook (NEPAD, 2010) reported that Kenya had a total of 6799 research personnel of which 3794 were classified as researchers. This suggests that 55.8% of the total research capacity is composed of researchers, which compares favorably with the range of 55% - 75% in most OECD countries (NEPAD 2010). Notably, more than 2200 (33%) of the total number of research personnel were holders of PhD or university degrees; while approximately 70% (4680) had tertiary level training. A national Innovation Survey conducted in 2012 indicated an innovation intensity of nearly 90% for the period 2008-2011; suggesting that a large majority of the 160 firms that were surveyed had implemented at least one form of innovation during the focal period (Kenya 2012, p.12). These indicators suggest the presence of considerably strong and vibrant human research capacity within Kenya’s innovation system.

The capacity of a national research system can also be examined based on knowledge production in the form of refereed research publications (Tijssen 2007). The recent African Innovation Outlook (NEPAD, 2010) that reviewed knowledge production capacities in 19 African countries placed Kenya in the fourth position after South Africa, Egypt, and Nigeria respectively. According to the SCOPUS database, the 19 African countries produced a total of 234 861 scientific papers between 1990 and 2009, representing some 78% of all papers produced by all the 54 African countries. The breakdown demonstrates the continuing dominance of South Africa (37%) and Egypt (27%), as well as the significant contributions of Nigeria (12%), Algeria (5%) and Kenya (5%). Between 1990 and 2009, Kenya’s science landscape was dominated by knowledge production in agriculture (26.5%), medicine (22.8%), immunology and microbiology (10.9%) and Biochemistry and molecular biology (10.0%). The social sciences are in fifth place with a contribution of 7.7% (NEPAD, 2010).

A more recent survey has examined Kenya’s knowledge production profile using an updated SCOPUS database (INASP 2012). According to this latest study, between 2000 and 2010 Kenya-based researchers produced 10508 published papers featured on SCOPUS. The table below provides the distribution of publications by disciplinary domains for each year between 2000 and 2010. The data shows that the medical sciences, agriculture, and
biological sciences combined still command about 77% (8108) of all publications produced in Kenya. The social sciences and economics contribute 13% (1356) while all other disciplines combined together shared the remaining 11% (1116) of the total knowledge production (INASP 2012).

Table 2: Number of publications by Kenyan researchers by discipline (2000-2010)

<table>
<thead>
<tr>
<th>Academic disciplines</th>
<th>Year and Number of Publications</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
<td>01</td>
</tr>
<tr>
<td>Medical sciences</td>
<td>191</td>
<td>190</td>
</tr>
<tr>
<td>Agric. &amp; Biology</td>
<td>211</td>
<td>267</td>
</tr>
<tr>
<td>Social sci./ econ.</td>
<td>63</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other disciplines</td>
<td>108</td>
<td>78</td>
</tr>
<tr>
<td>Total Publication</td>
<td>573</td>
<td>610</td>
</tr>
</tbody>
</table>

Table 3 below portrays another major characteristic of the Kenyan science landscape. The table shows that the knowledge production landscape is dominated by the giant public-funded research institutes and locally-based international research organizations. As judged in terms of publications captured on SCOPUS database, the university sector is completely dwarfed by these independent research powerhouses. The universities are associated with an estimated total of 3781 papers compared to an estimated 5052 papers produced by the public and locally-based international research institutes. The Kenya Medical Research Institute (KEMRI) dominates knowledge production in the non-university sector with a record of 1648 published papers published between 2000 and 2010. This is followed distantly by ICIPE (703 papers), ILRI (685 papers) and National Museums of Kenya (524 papers). Among the universities, Nairobi University is the dominant knowledge producer with 2133 published papers representing nearly 60 per cent of all papers attributed to all Kenyan universities. Other productive institutions are Kenyatta University (607 papers), Moi University (562 papers) and JCUAT University (479 papers). The younger universities such as Masinde Muliro University and Maseno University have no publications whereas Egerton University, despite being one of the older institutions, does not feature in any recognized publications in the SCOPUS database (INASP 2012). This asymmetric science landscape is well captured in the table 3 below. The
overall interpretation is that knowledge production in Kenya is shifting away from universities and is currently firmly dominated by non-traditional, non-university knowledge producers; a trajectory that suggests the gradual emergence of Mode 2 knowledge production dispensation in Kenya (Gibbons et al 1994).

Table 3: Publication productivity by actors within Kenya’s research system (2000-2010)

<table>
<thead>
<tr>
<th>Universities</th>
<th>No. of Papers 2000-2010</th>
<th>Research Institutes (Public)</th>
<th>No. of Papers 2000-10</th>
<th>International Research agencies</th>
<th>No of papers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nairobi university</td>
<td>2133</td>
<td>Tea Research</td>
<td>32</td>
<td>ILRI</td>
<td>685</td>
</tr>
<tr>
<td>Kenyatta University</td>
<td>607</td>
<td>Coffee Research</td>
<td>11</td>
<td>Agro forestry</td>
<td>375</td>
</tr>
<tr>
<td>Moi University</td>
<td>562</td>
<td>Sugar Research</td>
<td>4</td>
<td>Potato centre</td>
<td>49</td>
</tr>
<tr>
<td>JKUAT</td>
<td>479</td>
<td>Forestry Research</td>
<td>64</td>
<td>ICRISAT</td>
<td>53</td>
</tr>
<tr>
<td>Maseno University</td>
<td>00*</td>
<td>Marine Research</td>
<td>116</td>
<td>ICIPE</td>
<td>703</td>
</tr>
<tr>
<td>Masinde Muliro University</td>
<td>00*</td>
<td>KEMRI</td>
<td>1247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egerton University</td>
<td>00*</td>
<td>KEMRI-Wellcome</td>
<td>401</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 Private Universities</td>
<td>00*</td>
<td>KARI</td>
<td>394</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>National Museum</td>
<td>524</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>3781</td>
<td>TOTAL</td>
<td>3187</td>
<td></td>
<td>1865</td>
</tr>
</tbody>
</table>

4.2.4.6: Funding Kenya’s research system
Establishing and maintaining a vibrant national research system can be a complex and costly undertaking for any country, but developing countries can encounter even more complex financial and structural constraints. The Gross Expenditure on Research and Development (GERD) is one of the key indicators of how much money a country dedicates to research and development activity as a percentage of its GDP. The Frascati Manual (OECD, 2002) suggests that the appropriate expenditure data for computing GERD can be collected for four sectors: the business sector, government sector, higher education sector, and private non-profit organizations. African Union adopted a resolution that commits each African country to spend targeted 1 per cent of its GDP on Research and Development (African Union 2006). The 2010 African Innovation Outlook (NEPAD, 2010) shows that Kenya’s gross expenditure on research and innovation exceeded KSh 7.6 billion during
2007/2008. If converted into comparable Purchasing Power Parity, the expenditure levels translates into a GERD of PPP$ 277.8 million (approx. US$90 Million), which means that Kenya spent 0.48% of its GDP on Research and Development. To put this into perspective, this gross expenditure on R&D is just under half of the overall African target of 1 per cent of the GDP. South Africa spent PPP$ 4976.6 representing 1.05% of its GDP while Nigeria spent PPP$ 583.2 or 0.2% of its GDP (NEPAD 2010, p.37). The overall picture is that Kenya’s expenditure is moderate.

The *Medium Term Expenditure Framework Report* (Kenya 2010) provides a useful but more specific breakdown of the actual expenditures attributed to the Research Innovation and Technology Sector. Unlike the *African Innovation Outlook*, the estimates provided by the MTEF Report are more accurate and do not include private sector expenditures on research and innovation activities. The table below shows that total recurrent expenditure by the RIT sector increased from nearly KSh. 22.5 billion in 2007/08 to approximately KSh 38 billion in 2009/2010 Financial Year; representing a growth of 69% in sectoral expenditure. For the FY 2011/12 the RIT Sector was allocated a total of KShs 44.2 Billion to finance recurrent and development expenditures. The Ministry of Higher Education Science and Technology (MoHEST), which is the parent ministry for all public universities, saw its recurrent expenditure rise from KSH 15.7 billion to over KSh 23 billion during the same period. While it is not clear how much of this money actually went into funding universities it suggests that funding to the higher education sub-sector has continued to increase.

*Table 4: Funding for Kenya’s Research Technology and Innovation Sector*

<table>
<thead>
<tr>
<th>Sub-sectors</th>
<th>Actual Expenditures (Millions KSh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent</td>
<td>Devt.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.2.4.7 STI Policy Gaps and Capacity Deficits

The body of recent policy instruments and sectoral restructuring programs discussed above represents Kenya’s unprecedented efforts toward establishing a dynamic knowledge-driven development paradigm anchored on science technology and innovation. At least in theory, these blueprints represent the most comprehensive policy framework aimed at mainstreaming research and innovation into the country's development management. In concrete terms, the government’s national STI strategy requires greater emphasis on science, technology, engineering, and mathematics training in universities (Kenya 2006; 2007a; 2009). The Vision 2030 states that ‘public and private universities will be encouraged to expand enrolment, with an emphasis on science and technology courses (Kenya 2007a, p.16). The Wandiga Task Force Report (Kenya 2007b) made a strong recommendation regarding the need “to create a culture of knowledge generation, adaptation, application and innovation in Kenyan universities” (p.36).

The STI Strategy Paper also proclaims that “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” (Kenya 2009, p.9). These series of recent policy statements, among many others, represent a specific and growing focus on science-oriented training programs and point to a vital and radically redefined role for universities, public research institutes, and other major stakeholders in the new knowledge-based economic dispensation. However, any critical review of the policy papers against reality on the ground suggests that there are gaps,
deficits, and inconsistencies that cast serious doubts on the Government’s commitment and the wide gulf between policy rhetoric and actual practice.

The attainment of these goals present immense human, financial, and governance implications that will require fundamental paradigm shifts. However, on closer scrutiny, widening contradictions and gaps still dominate between the government’s new ambitious knowledge-intensive development policy regime and the higher education institutions that are supposed to drive this transformative national strategy. In particular, the extent of the government’s commitment to effectively implement and sustain this new dispensation is still not entirely clear. For instance, the *National STI Strategy Paper* (Kenya 2009) is replete with policy recommendations for promoting science and technology within universities but does not provide any information on budgetary investments or specific time-scales that can be used to determine the level of the government’s commitment and preparedness.

The *Research Technology and Innovation Sector* Report (Kenya 2010) outlined the funding and expenditure levels allocated to Kenya’s national research system. However, it also uncovers significant and quite disturbing financial deficits facing each of the key agencies within the RIT sector. Based on the sector’s actual financial requirements the funding provided by the government in 2007/08 and 2008/09 financial periods implied budget deficits of Ksh 56 billion and 60 billion respectively (Kenya 2010, ix). In FY 2011/12 the Sector required a total of KShs. 104.2 Billion yet the Sector was allocated a total of KShs 44.2 Billion, implying a gaping financial deficit of KShs 60 Billion (ibid, p. ix). These staggering budget deficits suggest that Kenya faces significant challenges and weaknesses in its efforts to fund its RIT programs (Kenya 2010, p.30); a scenario which could have damaging implications for the success of the entire knowledge-based economic trajectory (see also INASP 2012).

An even weightier question relates to whether, and to what extent this new knowledge-based development paradigm has been internalized and operationalised by the higher education sector which is supposed to be the critical driving force. An effective national innovation system of the type Kenya envisages in its *Vision 2030*is an integrated network of
firms, research centres, universities, communities, and other organizations that creates local knowledge and adapts global knowledge to solve local development challenges (Kenya 2007a). Such a system obviously requires universities that have sufficient capacity in terms of effective governance systems, research infrastructure, and adequate numbers of highly qualified academic staff. It also demands intensive networking, connectivity, and cooperation within and across institutions and organizations at national and international levels to promote knowledge exchange (British Academy/ACU, 2009).

On the contrary, the existing teaching activities in many of the Kenyan universities do not currently reflect the required levels of emphasis, organization, and funding in support of the national strategy for mainstreaming STI within the education system and embedding it firmly as an instrument for national development. Instead, Kenyan universities continue to intensify the traditional trajectory of unregulated market-oriented expansion, commercialization, mass enrolment, and the proliferation of programs predominantly in social sciences and humanities (Obamba 2011). The African Innovation Outlook (2010) suggested that Kenya had an impressive 3794 highly qualified researchers which seemed to compare well with OECD countries. The Africa survey even showed that 63% of these researchers were affiliated to universities whereas about 31% were employed by the Government sector which includes the public research institutes. However, the prevailing preoccupation with expansionist tendencies in Kenyan universities has profoundly over-stretched, dislocated, disempowered, and dispersed even the existing limited human capacity. The institutions have been hollowed out by the expansion.

The weakening of research capacity at Kenya’s university subsector is clearly evident from recent bibliometric studies which demonstrate that the Kenyan knowledge production landscape is dominated by the public research institutes and locally-based international research agencies (INASP 2012). The University of Nairobi alone produces over 60% of all papers from the university subsector, whereas some of the public universities and all the private institutions are not involved in any recognized knowledge production (INASP 2012).
Recent studies estimate that only 36% of total academic staff in Kenyan universities is trained to doctoral level (IUCEA 2006). This suggests a severe lack of both teaching and research capacity in Kenyan universities amid staggering increase in student enrolments (Kenya 2012, pp.161-62). Kenyan universities also face monumental challenges in developing doctoral training programs as well as reproducing and retaining the next generation of academic workforce. A recent study of 277 doctoral students in 3 Kenyan universities documented some of the major problems that have resulted in lengthy delays, high dropout rates, and poor quality doctoral studies (Ng’ethe, Jowi, et al, 2012). The study found that supervision was the greatest problem facing doctoral trainees (81%), followed by lack of research funding (68%), inadequate learning infrastructure and facilities (67%), and poor governance and bureaucracy (65%).

Recent official papers have highlighted the poor coordination, governance, funding, and utilization of research in Kenya as well as the severe lack of cooperation and synergy between university and industry and between university and national development priorities (Kenya, 2005; 2007; 2012). Cooperation and networking among Kenyan universities at the national level is either negligible or altogether non-existent since most universities are often preoccupied with pursuing short-term and mostly unequal linkages with universities in the industrialized countries (Obamba, Mwema, and Riechi, 2012).

A national study commissioned by the Commission for Higher Education (Gichanga, 2005) reported that there was limited collaboration between Kenyan universities and industry. This fragmentation and non-synergy is partly due to lack of awareness by local industry of the potential research contributions from Kenyan universities; and partly the lack of awareness on the part of university researchers regarding the needs of the industry that can form the basis for research partnerships (Kenya, 2007b). The recent Innovation Survey (Kenya 2012) found that the linkages within Kenya’s innovation system are weak. The survey concluded that knowledge-based institutions including universities, public research institutes, and all other tertiary institutions are not actively involved or highly rated by the business sector as important sources of knowledge and information for innovation (Kenya 2012, p. 21).
The Wandiga Report observed that research enterprise in Kenya is constrained by the poor coordination and harmonization between researchers and research institutes, and the limited funding allocated to research (Kenya 2007b, p.159). To remedy this deficit, both the Wandiga Task Force report (Kenya 2007b) and Vision 2030 (Kenya 2007a) strongly recommended the development of strategic linkages and partnerships between universities and industry to enhance mutual knowledge exchange, collaborative research, and innovation transfers. Kenya’s intermediate organizations such as research institutes and think tanks have come under criticism for contributing to the prevailing poor coordination and university-industry synergies. The STI Strategy (Kenya, 2009) observes that Kenya’s intermediate organizations have not succeeded in creating an overall system of learning, knowledge production, and problem solving. The paper further claims that “Kenya’s innovation system is linear and does not effectively serve critical national needs” (Kenya 2009, p.27). The gap between university knowledge system and the productive economic system appears widespread in sub-Saharan Africa. A recent World Bank report on Africa notes that “universities in each country are yet to nurture problem-oriented research that would interact with and contribute to the leading economic sectors” (World Bank 2009, p. xxv).

4.3 The impacts of internationalisation
Internationalisation has a remarkably long history within the academia straddling back to the medieval ages but it has acquired growing significance in recent higher education debates and practices worldwide. This paper embraces the widely used definition of internationalisation provided in Knight (2005). Knight defines internationalisation as ‘the process of integrating an international, intercultural and/or global dimension into the goals, functions (teaching, research, services). There are multiple developments that seek to explain this increasing recognition and interest in the international ramifications of higher education.

First, various dimensions of higher education trends, practices, and phenomena are increasingly examined through international comparative approaches (Huisman & der Wende 2004). Secondly, there is a growing active involvement of international
development organizations and supra-national governance structures and networks in matters of higher education development, analysis, governance, and policymaking are also seen as important manifestations of the global interconnectedness and mutual interaction among economies, labour markets, cultures, and societies across national boundaries (de Boer, Huisman et al. 2002).

Another significant development that drives internationalisation is the growing realization that a wide range of contemporary problems tend to be complex, dynamic, and trans-boundary; which implies that their solutions must also be increasingly collaborative, multifaceted, crosscutting, and multidisciplinary (Gibbons et al. 1994; McArthur and Sachs 2009). The rise of this new trans-boundary paradigm of problem-solving has resulted in a much stronger global focus on international collaboration and partnerships among universities and other organizations in knowledge production, use and sharing (Koehn and Obamba 2012). Notwithstanding these recent developments it is important to recognize that the scope, patterns, intensity, and outcomes of internationalisation tend to vary widely across countries and across individual higher education institutions around the world. Internationalisation therefore does not constitute a uniform terrain.

The process and magnitude of internationalisation can be examined both at the national level as well as at the scale of individual higher education institutions (Knight 2005). At the national and institutional levels, manifestations of internationalisation can take a wide variety of dimensions and at different levels of intensity and consistency (Qiang 2003). Some authors have recently suggested a set of generic indicators that can be applied to provide a picture of the extent of internationalisation within a given institution or to perform comparative analyses of internationalisation across different institutions (Brandenburg and Federkeil, 2007).

According to Brandenburg and Federkeil (2007), the broad range of key indicators of the internationality of an institution include: management structure and policies; academic faculty and student profile; the orientation of curriculum, teaching and academic programs; non-academic staff profile; levels of funding allocated to international programmes,
number of active international collaborations and mobility; and levels of international research funding and publications. Qiang (2003) has also suggested a dynamic analytical framework that may be applied to understand the scope and character of internationalisation processes, programs, or activities within higher education institutions. The framework is based on the idea that internationalisation programmes of a university or country can be organized analytically along two intersecting dimensions.

Along one axis, internationalisation activities can be undertaken either in a ‘systematic’ or ‘sporadic’ pattern. The second axis is concerned with whether internationalisation programmes can be either ‘central’ or ‘marginal’ to the institution’s overall corporate strategy. Qiang (2003) explains that some institutions undertake internationalisation programmes ‘in a sporadic, irregular, often knee-jerk way, with lots of loose ends in terms of procedure and structure; whereas others tend to develop more precise explicit procedures in an ordered and systematic manner’ (ibid.:259). Hence, for some universities internationalisation is a relatively marginal activity - an interesting addendum to a predominantly regional or national focus; whereas for others, internationalisation is highly central to their work and permeates every aspect of institutional life (Qiang 2003:259). In sum, therefore, the indicators identified by Brandenburg and Federkeil (2007) and the two-way conceptual model (Qiang 2003) can provide one useful analytical framework and set of building blocks for discussing the scope and character of internationalisation in Kenya’s higher education.

4.4 National Policy Landscape
Internationalisation, or at least international consciousness, has been a familiar feature in the development of Kenya’s education policy for many decades. Indeed, the very first higher education institution on Kenya soil, the Royal Technical College Nairobi (later University of Nairobi), had significant international ties and exchanges with the University of London and Makerere University, Uganda (Kenya 2006). The development of university education in the East African region, and indeed in most parts of the continent, has traditionally incorporated some degree of a regional and international dimension.
The first three university colleges that emerged in the three countries within the East African Territory before independence were confederated to form the Federal University of East Africa, which consisted of Makerere College Uganda, Nairobi College Kenya, and Dar es Salaam College Tanzania. The three separate university colleges also maintained intense collaboration with the parent University of London on a wide range of matters including curriculum development and delivery, policy, governance, examinations administration, and certification. This impressive international tradition represents the earliest and barest manifestations of internationalisation in Kenya’s higher education.

Another important early dimension of internationalisation in Kenya constituted the out-bound mobility of Kenyan students and senior government officials to pursue further studies and training overseas, both through independent initiatives and as through specifically organised mobility initiatives such as the Airlift Programme during the 1960s. However, in-bound student mobility to Kenya was non-existent or at least negligible at these earlier times.

Policy papers in Kenya have also captured aspects of internationalisation in a sporadic and disjointed pattern over the decades. The Ominde Commission Report (Kenya 1964) declared that one of the goals of Kenya’s education system was to ‘foster international consciousness’; although the report did not articulate how this goal would be achieved or operationalised. No other Sessional Paper during the 1970s and 1980s ever referred to the international dimensions of Kenya’s education until the Koech Report (Kenya 2000). The Report claimed that education is ‘to nurture internationalisation of universal knowledge, including key technological advances, with a view to harmonizing it for national development’ (Kenya, 2000).

However, the specific rationales or mechanisms through which Kenya would embrace internationalisation are hardly clearly articulated or operationalised in the report. The mentioning of ‘internationalisation’ in this report therefore represents an isolated and unsubstantiated claim that is not part of a coherent program or policy for internationalisation. Both Sessional Paper of 2005 (Kenya 2005a) and the ambitious World
Bank-funded *Kenya Education Sector Support Programme* (Kenya 2005b) do not refer to internationalisation; instead only mentioning Kenya’s statutory obligations under international treaties, protocols, and goals including EFA and Millennium Development Goals. The KESSP and *Sessional Paper No. 1 of 2004* (Kenya 2004) that it draws from both assert that Kenya’s education should be “globally marketable”; but in both documents there is total silence on how Kenya’s education programs and products can be re-engineered to meet the requirements of international markets for students and labour.

A Ministry of Education report published in 2004 suggests that the government should formulate policies that promote ‘partnerships between foreign universities and local institutions to offer their degree programmes locally’ (Kenya 2004:48). This is a positive suggestion but it is an isolated move and there is no evidence that the government or local institutions actually followed it through.

More recent government reports and policy blueprints emerging since at least 2006 have increasingly embraced the discourse of internationalisation, even though they too do not provide much in terms of a more coherent policy framework or strategic vision for the internationalisation of universities. The first report in this category is the *Public Universities Inspection Board* (PUIB) Report (Kenya 2006). This report emphasizes the importance of the international dimensions of Kenya’s higher education in a globalizing world and states that ‘internationalisation is aimed to enrich scholarship and diversity, invigorate intellectual inquiry and research, and foster international understanding’ (Kenya 2006:71). It recommends that Kenyan universities should put in place mechanisms and resources to strengthen their international presence and integration into the competitive global knowledge economy.

Similar insights and recommendations are strongly emphasized in the *Wandiga Task Force* (Kenya 2007). Wandiga Report calls for stronger linkages and partnerships between Kenyan universities and their counterpart universities at the international level as well as with key international development and scientific agencies. It also recommends the strengthening and expansion of KENET, Kenya’s national education and research network.
(NREN), in order to provide a platform for increased connectivity and collaboration among universities not only at the national and regional levels but also crucially at the international level (p.285). Hence a key recommendation of the Wandiga Report is to “develop strong university linkages and partnerships that enhance mutual learning, research and innovation emanating from the universities” (p.278).

The 2008-12 Strategic Plan of the Ministry of Higher Education also captures this emerging discourse on internationalisation and emphasizes the strategic importance of university collaborations and linkages with both local and international universities and organizations (Kenya, 2008). The Vision 2030 (Kenya 2007), Kenya’s current national development blueprint also portrays a strong recognition of the international dimension of Kenya’s higher education by suggesting that it should be globally competitive. International and regional linkages and cooperation in research and development initiatives also form a central focus within Kenya’s STI Strategy Paper, suggesting a clear trajectory for internationalisation (Kenya 2009, x). These recent policy blueprints represent the growing embeddedness and vibrancy of the internationalisation discourse within the overall policy landscape in Kenya. However, internationalisation at the institutional level portrays a more fragmented and uneven terrain.

4.5 Institutional implications of internationalisation
Kenyan universities - both the old and newer ones - have demonstrated varying levels of scope for incorporating an international dimension to their profiles with regard to research collaborations, infrastructure development, and institutional linkages particularly with universities in industrialised countries. Indeed, the wide majority of Kenyan universities are involved in at least a small number of active linkages and partnerships of diverse forms with other universities and agencies at the international levels and most universities have utilized these international collaborations to promote faculty development, acquire equipment and develop physical infrastructure, and generally build institutional capacity (Jowi et al. 2007; Obamba, Mwema, and Riechi, 2012).
Some international linkages in Kenyan universities are initiated at the institutional level whereas others are part of broader collaborative programs involving other universities and are often externally-funded and initiated. For example, Moi University and Nairobi University are both participating in the VLIR International Cooperation Program funded by the Belgian government as well as in the EDULINK Higher Education Cooperation program supported by the European Union to promote research cooperation and academic mobility among ACP countries and EU member countries (Obamba et al 2012; Obamba 2012). In 2011, Moi University had approximately 100 active international linkages of various kinds, including the flagship and long-standing AMPATH partnership program between Moi University and Indiana University Medical Schools (Obamba, Mwema, and Riechi, 2012).

An emerging characteristic of many international linkages and partnerships in Kenyan- and African- universities is the focus on tackling specific development challenges, particularly those linked to achieving Millennium Development Goals (Obamba, 2012). However, most international linkage programs are often short-term, conceived narrowly for a particular purpose rather than comprehensively, and are largely driven and dominated by the foreign provider of funding (Obamba and Kimbwarata, 2009). As a result of power asymmetries and a lack of strong institutional embeddedness and ownership, many international linkages start to weaken and disappear shortly after the termination of the external funding (Obamba and Koehn 2012).

Kenyan universities are also active on the international scene as members of a wide range of major international and regional bodies, including the Association of African Universities, International Association of Universities, Association of Commonwealth Universities, and many others. All Kenyan universities have been collaborating nationally and regionally in the area of Internet bandwidth purchases and development of network infrastructure for sharing research and knowledge content across institutional and national border through the Kenya Education Network (KENET) which is part of an Africa-wide terrestrial optic-fibre connectivity project (Jowi and Obamba 2013). Most Kenyan universities develop research partnerships predominantly with universities in the industrialised countries whereas the domain of national-level research and development
cooperation among Kenyan universities remains strikingly dormant and poorly developed (Obamba et al, 2012).

A fundamental dimension of internationalizing a university is the realignment of its vision, mission and philosophy to make it more adaptive to programmes, activities, networks and processes that constitute internationalisation (Brandenburg and Federkeil 2007). As Qiang (2003) has asserted, it is crucial to consider both the academic and the organizational elements that constitute internationalisation. Any critical review of the visions and strategic plans of many of the Kenyan universities illustrates that internationalisation has become a clearly dominant discourse and rhetorical priority.

The various universities’ policy documents mention a wide range of actions that each institution plans to undertake to promote its own internationalisation profile. For example, The University of Nairobi Strategic Plan identifies internationalisation and international linkages as a key priority for the university’s strategic vision. The university states that ‘more value-adding networks, partnerships and linkages need to be built at local, regional, and international levels if the university is to reposition itself in the global arena as a viable and vibrant institution of higher learning’ (University of Nairobi 2008: 25-26).

Moi University’s current Strategic Plan notes the overwhelming importance of globalisation and the fact that university education must be considered in a global context. However, with respect to specific internationalisation initiatives, the Strategic Plan generally mentions isolated elements scattered loosely under various headings but without a coherent focus of priority on internationalisation (Moi University, 2005). Most Kenyan universities have increasingly developed structures variously known as ‘International Programs Office’ that are supposed to drive the internationalisation agenda. However, these structures tend to have a narrow and fragmented perspective of what internationalisation entails and many lack the capacity, funding, resources, and adequate mandates necessary to undertake international activities (Jowi at al 2008; Obamba et al, 2012). Put differently, internationalisation in most Kenyan universities is narrowly defined, inadequately supported, and is seen predominantly as part of the universities’ frantic
clamour for income and prestige rather than as a serious and coherent institutional activity.

The internationality of curricular, research programmes, student and faculty profiles are some of the key indicators of internationalisation at the institutional level (Brandenburg & Federkeil 2007). In the dimension of curriculum development and pedagogical approaches, there has been limited or no coherent attempt to integrate international and multicultural dimensions into the academic programmes and teaching, particularly in public universities. Academic programmes, teaching, as well as the organization of academic practices and environments in Kenyan universities have remained predominantly oriented toward meeting the needs of local students and the domestic labour markets (Jowi 2009).

Academic programs in Kenya do not include elements of international mobility or international exposure ‘at home’ for students or even faculty (Jowi et al 2008; Knight 2008). However, some private universities in Kenya have a higher international profile in these dimensions. The USIU, for example, in 2009 pioneered the introduction of premium academic programmes that both incorporate a strong international component in their content, conceptualization and nomenclature, and also attract a more international student clientele. For example, the USIU’s Global Executive MBA (GEMBA) is conducted in partnership with faculty and resources from a leading business school in the USA, incorporates international student and faculty mobility, and is funded jointly by the Coca Cola Africa Foundation (Obamba 2009).

As regards the profile of the academic faculty and the student community, the Kenyan landscape portrays a growing trajectory towards greater localization, particularly in public universities. A recent government report admitted that the configuration of the student and faculty community in Kenya’s public universities has become predominantly local since the 1980s (Kenya, 2006); and the emerging trend of proliferation of universities along ethnic boundaries is leading to new depths of localization, insularity, and fragmentation. In a 2008 survey, researchers reported that out of the total enrolment of about 130,000 students in
all Kenyan universities; only 562 were international students, of which more than 350 were enrolled in just one private university (Jowi et al. 2008).

4.6 Conclusion
This paper has provided a critical review of the changing education and development policy landscape in Kenya over the nearly five decades since independence in 1964. The analysis demonstrates that different policy regimes and priorities became prominent at different times before falling into decline and being replaced or sedimented by newer priorities. A key point to recognize, however, is that the successive policy regimes are hardly completely distinct from each other; instead each represents some degree of reproduction, overlap, or even intensification of the preceding regime.

With respect to the current knowledge-based policy paradigm anchored on Science Technology and Innovation, the study demonstrates that there has been a significant and sustained government focus on providing an integrated institutional and policy framework for building a knowledge-based economic dispensation. However, this paper highlights the prevailing policy-practice gaps and contradictions, doubtful government commitment, as well as the severe deficits and inconsistencies in the capacity of most Kenyan universities to adequately embrace and drive an unprecedented national development agenda anchored on science technology and innovation. The scope and character of Kenya’s National Innovation System has been critically discussed. The analysis suggests that Kenya’s knowledge production landscape is increasingly dominated by the non-traditional, non-university knowledge producers, whereas the entire university subsector plays a relatively peripheral role in the country’s science landscape.
4.7 References


Chapter 5

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Case study on Uganda

5.1 Background to higher education in Uganda
The history of higher education in Uganda dates back to 1922, with the start of Makerere as a technical college (Kasozi, 2003). It expanded over the years to become a centre of higher education in East Africa in 1935. In 1937, the college changed into an institution of higher education offering post-school certificate courses. In 1949, it transformed into a constituent college of the University of London (Bailey, Cloete&Pillay, 2012). In 1963, Makerere became the University of East Africa offering courses leading to the general degrees of the University of London. In 1970, it became a full- fledged national university of the republic of Uganda, offering and awarding its own undergraduate and post-graduate degrees.

At independence, Uganda had one of the best higher education systems in Africa, attracting many students from neighboring countries. However, the widespread political and economic instability that befell the country between 1960s and 1980s damaged the Higher education system and created problems of funding, quality and educational relevance (Musisi, 2003). According to Kasozi (2003), the military rule and mismanagement of the economy between 1971-1979, and post Idi Amin civil wars of the 1980s depicted a sad phase in the country’s educational development. During this time the higher education system lost its credibility, integrity and professionalism. This had serious implications to academic quality and research capacities of the system.

With a return to normalcy in late 1980s, the higher education system in Uganda generally comprised of universities, national teacher colleges, colleges of commerce and technology and other tertiary institutions (Obwona & Ssewanyana, 2007). However, this paper focuses only on the growth and development of Ugandan universities that offer degree courses or programmes.
Universities in Uganda are categorized into public and private. Public or state funded universities are established by an Act of parliament while private universities are chartered, licensed or unlicensed (Bailey et al., 2012). Private universities are chartered and licensed by the National Council for Higher Education (NCHE). With increased demand and the liberalisation of the education sector in 1990s, Uganda recorded rapid increase in the number of public and private universities. Uganda has five public universities most of which were established in the last quarter of the twentieth century: Makerere University (1922), Mbarara University (1989), Kyambogo University (2002), Gulu University (2002) and Busitema University (2007). In addition, other twenty four privately owned universities blossomed from 1990s onwards, with Ndejje University being the first to be established in 1992 (Owoeye & Oyebade, 2011).

The tertiary education sector in Uganda comprises two tiers, namely degree awarding universities and ‘other tertiary institutions’ commonly referred to as the technical sub-sector, which offer diplomas and certificates. There are 152 higher education institutions in Uganda of which 51 were public while 101 were private. The university tier had 28 institutions – five public, 13 chartered and licensed private, and ten unlicensed, private universities. There were 124 ‘other tertiary institutions’ out of which 46 were public. The dominant institutions amongst public ones are national teacher colleges, health training institutions and theological institutions. Private institutions mainly comprise colleges of commerce and management institutions.

5.1.1 Private provision
Although the bulk of private (i.e. fee-paying) university students are found in public universities, Uganda has witnessed an upsurge of private universities in recent years. While in 1988 there was only one private university, the number has risen to more than 20 in 2005, representing 82% of the total number of universities in the country. Only one private university, Kampala International University, is regarded as a for-profit institution. With the exception of the Islamic University, which was founded by an international body – the Organisation of Islamic Conference – private universities in Uganda fall into three main
categories including religious-founded (local), community-founded, or evolved from other tertiary institutions. These institutions depend mainly on tuition fees paid by students and donations made by the founding bodies. All private universities offer undergraduate degrees predominantly in the humanities, with a few institutions offering postgraduate programmes in the humanities and soft sciences.

The rising demand for higher education and government’s reluctance to finance higher education has led to an increase in private expenditure on higher education and public institutions bidding to develop various mechanisms for generating funds from private households. Moreover, in public institutions, most students now pay fees as a result of the dual-track entry scheme. This dual-track scheme was instituted in 1992 and legalised by the Universities and Other Tertiary Institutions Act (2001).

5.1.2 Funding of the system
In the last decade, there has been a decline in public funding of universities as student enrolment continues to increase steadily. This due to the government’s adoption of the Education Sector Investment Programme (ESIP) of 1998 whose primary focus was on funding of universal primary education. ESIP became a blue print guiding the allocation of funds between education sub-sectors. This move resulted into a drastic decline in public expenditure on higher education. Universities were thus encouraged to generate resources to supplement their own budgets, as well as to encourage the private sector to play a more active role in the provision and funding of higher education (Bailey et al., 2012). As a result, public universities put up various mechanisms for generating funds from private households.

The education reforms have led to three sources of financing for higher education including the government (public), private (tuition and other fees) and donor funding. Although both private and donor funds played a relatively minor role, in recent years these two sources of funding have become crucial in the provision of higher education, so much so that in their absence, higher education in Uganda would be in a terrible crisis. While public and donor
funds are to be found in both public and private institutions, public funds for higher education are only allocated to public institutions.

Funds allocated to higher education through the Education Sector Investment Program arrangement is subsequently sub-divided among four public universities and over 40 ‘other tertiary institutions’. Regrettably, there are no clear guidelines shaping allocations within the sub-sector. Instead, there is what is referred to as government subvention, line item funding, and project financing for newly established universities. These public financing modes run alongside the dual-track system of tuition fees. Public funds are disbursed to institutions through four distinctive channels: (a) directly from the Ministry of Finance, (b) through Modes departments of Higher Education; Business, Technical and Vocational Education Training Institutions (BTVET) and Teacher Education, (c) through the district, and (d) through other line ministries.

Public universities (Makerere, Mbarara, Kyambogo and Gulu) are required to submit a budget to parliament. Nonetheless, parliamentary allocations are hardly influenced in a substantive way by these submitted budgets. Instead, allocations are based on the institution’s historical allocations, its size and needs, although not in a consistent manner. Government funds are disbursed to universities in two blocks: recurrent and development budgets. For the recurrent budget, each public university receives block grant or ‘subvention’. The amount of the subvention is purportedly calculated using the number of government-sponsored students and the ‘unit cost’ which the Ministry thinks is ‘reasonable’ for that particular institution.

Unit costs have ranged from USh 1.5 million (USD 680) in Kyambogo University to USh 16.1 million (USD 7 300) in Mbarara University of Science and Technology. Ministry personnel in charge of budgeting insist that the government ‘unit cost’ is calculated slightly higher, often more than twice the amount of the annual fee paid by a private fee-paying student, because it is inclusive of the student’s welfare costs. For instance, in the financial year 2005/2006, Makerere University received a subvention of Ush 35 billion (USD16 million) calculated at about 7 000 students at a unit cost of USh 4 million (USD 1 800) per student.
The main categories of education expenditure are the following: District Primary 57%, District Secondary 15%, Universities 10%, MoES plus primary 14% and District Tertiary 3.5%. Financing of higher education in Uganda is input-based, with minimal attention paid to the process and the outputs that accrue out of institutional activities. The primary driver of financing seems to be enrolment. Assessment of institutional performance is mainly based on the number of students admitted and registered per institution. A study of 15 institutions by the Makerere University Institute of Social Research (2003) revealed that 72% of the total funding in higher education went to Makerere University, compared to its 75% enrolment share.

5.1.3 Public and private support to higher education

Over the past ten years, the phenomenon of public-private partnerships has manifested itself in the enrolment structure and in the resource inflow to public universities as part of tuition and other fees paid by students. The percentage share of private resources in public institutions has overtaken government support. At Makerere University, for example, funds from private sources contributed 60% to total recurrent expenditure in 2005/06 up from 28% in 1996/97. Kyambogo University had 51% of the recurrent budget from private sources in 2005/2006.

Mbarara University of Science and Technology, which has a better public funding arrangement than Makerere University, raised only 22% of its total support in the same financial year, from private sources. However, the increase in private resources both in Makerere and Kyambogo is considerably lower than the growth in private student numbers. For example, at Makerere University, private students constitute 80% of the total enrolment compared to the resource contribution of 60%. Likewise, in Kyambogo University private students constitute 82% of the total enrolment compared to the 51% contribution to the budget.

Considered in this light, students in Kyambogo University are much more highly subsidised by government compared to those in Makerere. This confirms the earlier observation that
the unit government contribution in Kyambogo is much higher than in Makerere. It also highlights the fact that private students do not pay the true cost of the higher education they receive. Moreover, on average, a mere 17% of the students in public universities are government-supported with all costs, including tuition, accommodation and welfare costs, borne by the state.

To date, there is no clearly-defined student financing scheme in Uganda, as is the case in Kenya for example. Student financing takes the form of direct public or private support. Public support for higher education is reserved for a few students admitted to public institutions based on academic merit. For universities, students receive a ‘full’ government scholarship. The scholarship, which is a block grant that universities receive, covers tuition, accommodation, scholastic materials and an allowance for field attachments in programmes with this provision. Government-sponsored students, however, are categorised into two: resident and non-resident. Resident students are accommodated in the halls of residence. This provision is by and large reserved for the top scholars in the various fields. These students receive support in kind apart from the faculty allowance (for scholastic materials) and a field attachment/internship allowance.

For the non-resident students, an allowance is given to cover accommodation, food and transport in addition to similar financial support that is given to resident students for scholastic and internships. The state has reserved an annual 4 000 positions for government sponsorship of students admitted into the five public universities. The system is merit-based and students with the highest grade points are admitted for scholarship based on the individual requirements of the institutions and the faculties where the students are to be based. The 4 000 students represent only 17% of the students who qualify for university entry and a mere 10% of the students who sit for entry exams.

In 2005/06 a new system was introduced primarily to redress the enrolment imbalance between sciences and the humanities. In the new system, 75% of the 4000 government-sponsored are admitted on the basis of merit but are limited to subjects deemed crucial to national development, specifically in Science and Technology, Law,
Performing Arts, and Economics. The remaining 25% of the 4000 places is used to address equity gaps. A quota system was introduced for the best students in each district, for persons with disabilities, and for sportsmen and women that meet the minimum requirements of specific institutions and programmes.

Students who do not qualify for government sponsorship are admitted through the private sponsorship scheme or to the ‘other tertiary institutions’. State scholarship therefore is highly competitive and mainly favours students from the higher socio-economic strata whose parents can afford good secondary schools. The 4 000 students who access state scholarships in the four public universities are mainly those from the higher income brackets as evidenced by the secondary schools they attended. For example, 47% of the students admitted at Makerere University in 2004/05-2006/07 for government sponsorship came from the 25 most prestigious and highly-selective schools.

This privileged group receives ‘free’ university education including tuition, accommodation, meals and other welfare costs. Additionally, because of the merit-based entry mechanisms, these students are admitted to the professional courses such as law and medicine. This further increases the socio-economic divide between the urban rich and the rural poor. Currently, only 18% of the more than 70,000 students in public universities receive full board government sponsorship.

The Ministry uses public funds to subsidise the universities. Because of the academic independence of these institutions and the mingling of public and private funds, it is extremely difficult to account for how public funds are spent. To address this problem, the Ministry will direct a higher portion of funds to students rather than institutions, allowing it to specify the disciplines in which these are focused (science and technology). This change will also make the market for higher education more market-driven by allowing students to enter the public or private institution that offers courses that meet their needs, thus leading to better quality and more attractive programmes.
5.2 Higher education governance and policy

The legal framework for the provision of higher education in Uganda is set by Universities and Other Tertiary Institutions Act of 2001 (Government of Uganda, 2001). The Act seeks to attain four goals: increasing access to quality higher education institutions, ensure quality in all institutions, provide avenue for equating similar professional qualification from other institutions, and to oversee establishment and management of higher education institutions.

On the other hand, the regulatory role of universities is vested in the National Council for Higher Education (NCHE). The roles include: to receive, process and accredit universities, monitor, evaluate and regulate universities, set standards and coordinate admission of students into universities, and to provide policy advice on matter to do with higher education.

The regulatory role of higher education is vested in the National Council for Higher Education (NCHE) as established by the Act. Among other responsibilities, the NCHE is responsible for the establishment and accreditation of public and private institutions of higher education; monitoring, evaluation and regulation institutions of higher education; ensuring minimum standards for courses of study and the equating of degrees, diplomas and certificates awarded by the different public and private institutions of higher education; setting and coordination of national standards for admission of students to the different institutions of higher education; and advising the government on policy and other matters relating to institutions of higher education.

The Act stipulates that the Higher Education Department within the MoES has jurisdiction over tertiary education. However, this seems to be only true in the case of universities as the Teacher Education Department is responsible for all the national teacher colleges while the Department of BT-VET is still responsible for some of the technical tertiary institutions, particularly health training institutions, colleges of commerce, and technical colleges. At the same time, other government ministries have jurisdiction of some over the ‘other tertiary institutions’ (e.g. the Aeronautical College is under the Ministry of Defence).
5.3 Policy framework for research and knowledge creation

Research is one of the three major mandates of any higher education system. Research forms a core background upon which teaching and community engagement rests. Research is therefore of paramount importance not only as a core function of any university but also a contributing factor to innovations and development of any country. In this regard, the Government of Uganda in 2007, approved the Comprehensive National Development Planning Framework (CNDPF) which provides for the development of a 30 year Vision to be implemented through: three 10-year plans; six 5-year National Development Plans (NDPs); Sector Investment Plans (SIPs); Local Government Development Plans (LGDPs), Annual work plans and Budgets.

Consequently, Cabinet approved the National Vision Statement, “A Transformed Ugandan Society from a Peasant to a Modern and Prosperous Country within 30 years”. The short term National Development Plan 2010/11 – 2014-2015 clearly stipulates the role of research in development initiatives, and more specifically recognises universities and vocational institutions as centres of research excellence. The plan looks at higher education as heart of education as well as the core of national innovations and development systems. The plan calls for increased funding for research in universities and in Business, Technical, Vocational and Education and Training institutions (BTVET).

The newly introduced Uganda Vision 2040 articulates clear strategies and policy directions to transform the country into a competitive upper middle income country with per capita income of USD 9,500. This requires average real GDP to grow at the rate of 8.2 per cent per annum translating into total GDP of about USD 580.5bn from USD17bn in 2010. Uganda’s population is projected to reach 61.3m from 32.9m in 2010. The Vision is aimed at transforming the Ugandan Society from a peasant to a modern and prosperous country within 30 years underscores the role of research in national development.

In order to supervise and direct research in higher education institutions, the Government of Uganda established the National Research Council (NRC) in 1970 through a cabinet decision. The NRC was later replaced by the Uganda National Council for Science and
Technology (UNCST) in 1990 (Ecru et.al, 2008). The UNCST has a responsibility for research oversight and advising on national research policy. It is also a research funding arm of government with a broader mandate of advancing not only research but science and technology holistically (Ecru et. al, 2008). Therefore, research matters in Uganda are coordinated nationally through the UNCST. The UNCST through the National Council for Higher Education ensure that research carried out in higher education institutions conform to the minimum standards and regulations for higher degree programmes. In this paper, we shall basically discuss and analyze research in universities because the quantity and quality of research carried out in other tertiary institutions is almost negligible.

The Makerere University Strategic Plan 2008/09 – 2018/19 is in conformity with the minimum standards and regulations for research set up by NCHE. The strategic plan underscores the importance of research as a major channel to scientific discoveries and innovations that drive national economies forward. The strategy recognises the fact that research is a pillar of both institutional and national development. The strategic plan is aimed at re-positioning Makerere University as a Research-led University through creating the environment and capacity for knowledge generation, innovations and utilisation.

Other universities both public and privates ones, have reoriented their strategic plans in line with the Makerere University strategic plan. The huge challenge to the realisation of a research based university lies in the area of resources, and especially funding research. The average money invested in research in public universities in Uganda is less that 7% of the total recurrent budgets of public universities. But, much of the funds allocated to research come from foreign funding, and especially through research collaborations. Shortage of funding for research has largely affected private universities because their links to local and foreign funding are quite limited. As a result, there is low research output in as far as research and development is concerned (Ecru, et.al 2008).

However, with the introduction of the public-Private Partnerships (PPP) in public universities and the gradual recognition of the role of a university to national development, links between universities with the industry are gradually taking shape. For instance, when the College of Engineering, Design, Art and Technology at Makerere University developed a
car that runs on rechargeable lithium batteries and a four kilometre test drive was successfully carried out, local and foreign attention was directed towards Makerere University and public confidence towards the university grew higher. It will take a little while to receive a fully fledged research-led university in Uganda, but the signs for such a university are emerging.

### 5.3.1 Knowledge production and research output

In this paper, knowledge production is viewed in terms of research publications and doctoral graduates produced. In this regard, Ugandan universities are characterised by a weak knowledge production as demonstrated by low doctoral graduation rates and low research output. In Makerere- the largest and established university in Uganda, for example, the number of research publications and doctoral graduates remain low (see Table 3). This suggests that Ugandan universities remain predominantly undergraduate teaching institutions. As a result, knowledge production outputs are seemingly not strong enough to enable the institutions make a sustainable contribution to development.

<table>
<thead>
<tr>
<th>Year</th>
<th>Research publications</th>
<th>Doctoral graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>73</td>
<td>11</td>
</tr>
<tr>
<td>2003</td>
<td>107</td>
<td>21</td>
</tr>
<tr>
<td>2005</td>
<td>118</td>
<td>25</td>
</tr>
<tr>
<td>2007</td>
<td>233</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: Bailey et al., 2012

In Uganda, the Government White Paper (1992) set five basic functions of Higher Education, two of which centers on research (particularly applied research), and publication of research papers, books and journals. Furthermore, the National Development Plan (NDP) policy document stresses the significance of research and innovation towards socio-economic development and transformation (Government of Uganda, 2010: 51). In line with the above policy requirement, Ugandan Universities seek to pursue goals which include:
- Generating advanced knowledge and innovations through research and to be able to adopt such knowledge to the local Ugandan situation
- Promote the development of local scientific and technological capacity required to deal with the problems of development.

The value of research for Uganda's national development particularly in areas such as health (e.g. combating Malaria and HIV), poverty reduction, engineering and technology cannot therefore be over emphasized. Consequently, the government devised plans and mechanism to assist universities move towards research activities. Such plans and mechanisms include:

- Provision of scholarship to train researchers in areas experiencing shortage such as medicine, science and technology, law, economics and industrial arts
- Legislation such as the Government White Paper (1992), which charges universities to generate knowledge and innovation through research, and its diffusion in Ugandan context.
- Provision of funds to supplement the cost of research activities within universities

The Uganda Millennium Science Initiative was started in 2006 through financing provided by the World Bank. The objective of the USD 35 million programme was to increase the number and quality of scientists produced by Uganda's universities and research centres, and to boost the country's technological productivity in industrial, agricultural and other sectors.

According to Egwang (2010), the Millennium Science Initiative has made great progress in areas such as malaria vaccines, banana processing and value addition, fisheries, agro-biotechnology, innovations in science and medical education, climate change, and innovative partnerships between the private sector and academia. There is a concern that the programme may be coming to an end because of a lack of enthusiasm by the government (specifically the Ministry of Finance which is responsible for science and technology) to request a renewal of the contract.
Universities are also the engine driving the national development agenda towards achievement either directly or indirectly. The achievement of national policy documents such as the Poverty Eradication Action Plan (PEAP) (MFPED, 2004), and the National Development Plan (NDP) (Government of Uganda, 2010), for example, requires university participation either directly or indirectly through teaching or research.

The five pillars of the Poverty Eradication Action Plan (PEAP) documents, for example, refer to ‘human development’ (MFPED, 2004). The document states that ‘education contributes to the accumulation of human capital, which is essential for higher income and a sustained economic growth’ (ibid.). PEAP further recognizes that university education supports poverty eradication by training a qualified and adaptable labour force of varying background such as scientists, teachers, business leaders and technicians. PEAP adds that universities have the capacity to generate and use knowledge (ibid.: 161). Working in collaboration with universities therefore becomes crucial in the fight against poverty. It is in this regard that PEAP targets to increase enrolment in higher education, to provide bursary to poor students, and to improve curriculum and higher education facilities.

Second, the National Development Plan (NDP) also underscores tertiary education, science, technology and innovation in development. The document stress that to reach socio-economic transformation, continuous improvement in how goods and services are produced and delivered is vital (Government of Uganda, 2010).

While there is a positive sign of an increasing awareness on the significance of the knowledge economy in the new national plans, the role of higher education has not been clarified or agreed upon. This is evident in, amongst others, the low level of funding and the low participation rates in higher education.

At institutional levels, the importance of knowledge economy amongst university stakeholders is strongly emerging, and is increasingly reflected in institutional policies or strategic plans (Bailey et al., 2012). Also evident is a strong orientation towards providing appropriate human resources to the growing economy. Despite showing a strong
development orientation, this awareness has not been institutionalized into policies and structures that can operationalize this new orientation. This is evidenced by the statement that ‘most institutions are still in the traditional mode of producing skills for the civil service’ (Bailey et al., 2012 p.104). Bailey et al., (2012) concludes that there is no broad agreement between national and institutional levels that knowledge, and by implication higher education, is key to development.

5.4 Institutional environment for research and innovation

With the emergence of digital revolution and knowledge economies, research in universities has gained more prominence than ever before. Through research, Ugandan universities are expected to use scientific methods to identify and find answers to problems affecting the society. In this regard, the report of the Visitation Committee to Ugandan Public Universities (2007), for example, gave prominence to research as one of the primary functions of universities. The report highlighted that universities needed to create and produce knowledge through research and to disseminate that knowledge through publications. The report further asserts that ‘a university that does not conduct research is like a high school and is condemned to intellectual and academic obscurity’. The report concludes that given the significance of research in this era, Ugandan universities cannot afford to remain mere teaching colleges consuming knowledge generated in other universities around the world. It recommended that the nation’s universities must join in competitive research to serve their purpose, justify their existence and build their national and international reputations.

Kyaligonza (2009) argues that research in Uganda universities has declined from 1971 over the years. This is partly due to economic and political instability, brain drain, poor remuneration and inadequate research funding. In 1971, for example, Idi Amin plunged Uganda into economic ruin and dictatorship. Asians who controlled the economy, the British, the Americans and other cadre of researchers in Makerere were either expelled or
forced to leave the country. This caused a decline in research activities which existed before 1971. The situation has not changed much to date. Kyaligonza (2009) further revealed that public universities in Uganda were failing to fulfill their functions of higher education as they lagged behind in research. They emphasized teaching at the expense of research. Seemingly, the government is also not very serious with matters to do with research as they fail to remunerate and motivate research supervisors, acquire research equipment/facilities and to increase funding for research.

Funding of university research activities in Uganda is done by the government, institutions and donors. Currently, Ugandan universities experiences acute shortage of research funding. Every year, public universities prepare and submit a budget for research to the government for funding. Unfortunately, research funds approved often fall far below 50% of the budget prepared by these universities. Furthermore, according to a study by World Bank, less than 15% of the Ministry of education budget is allocated for higher education (World Bank, 2000). The Structural Adjustment Programmes and other policies of international lenders have not done any better to salvage the situation. Most of these programmes shows a shift in policy that targets funding of basic education (both primary and secondary) while side-lining tertiary education level. The consequence of such underfunding is the decline in the quality of higher education and a drastic reduction of research in public universities.

Despite the fact that respective universities also set aside a small fund for research, the bulk of university research funds originate from development partners and the private sector through contract research, joint ventures, licensing and trademarks (Makerere, 2008b: 9). Moreover, instances of collaboration in funding of research projects by donor organizations such as NORAD of Norway, SIDA of Sweden and Carnegie Cooperation of New York are evident. The Millennium Science Initiative of 2006 funded by the World Bank to the tune of USD 35 Million is one such example. It aimed to increase quality of scientists from Ugandan Universities and to enhance technological productivity in industrial, agricultural and other sectors. According to Egwang (2010), the initiative made great progress in areas like Malaria Vaccine, fisheries, Banana processing, agro-
biotechnology and climate change. Furthermore, it encouraged linkage between academia and the private sector.

Ugandan universities are expected to play a significant role in public service. Public service activities of higher institutions include: consultancy, health care services, extra mural teaching, artistic performances, conferences, courses, seminars and symposia (Owoeye & Oyebade, 2011). Universities are therefore expected to spearhead, set and regularly contribute to the national research agenda.

5.5 University linkages with business/industries

Some of the functions of universities include teaching and research (Bailey et al., 2012). Through this there has always been some link between university development and economic/industry development. In Uganda, there has been some loose link between the universities and external stake holders which include business and industry. One of the links is based on the role of universities in training the pool of competent graduates who offer the required expertise to propel national and industrial growth. Universities have also contributed to the industrial growth by ensuring that the outputs (graduates they provide) are market oriented.

The private sector (industries) on the other hand provides the universities with useful feedback for improving the academic programs. (Bailey et al., 2012). The industry also offers graduates/trainees an enabling environment where they can express or gain experience of the theoretical knowledge acquired while in training through (practical/field attachments). Common examples include teaching practices attachment.

Despite the fact that universities are trying to ensure that there is always a constant supply of a pool of expertise in the market, the private sector and government are not providing as much support to the universities. This is evident as the government prefers outsourcing for consultancy services outside the country (Bailey et al., 2012). This practice has always undermined the progressive development of universities and shows lack of confidence that the government and industry have in universities. The link between universities and
industry is therefore not as strong as it ought to be. Universities have also been accused of not being responsive to the needs of the industry (Bailey et al., 2012).

5.6 Internationalisation and Higher Education in Uganda

As higher education institutions and especially universities are transforming themselves from basically teaching or regional universities to research-led institutions, global and international forces are emerging and have started to impact universities in Uganda. There is a gradual shift from student mobility (as the major manifestation of international education) as the case was in 20th Century to collaborative research, staff exchange, creating off-shore campuses and internationalising the curriculum.

The concept of internationalisation is taking shape in Uganda’s higher education institutions and especially universities. A sizeable number of institutions are offering either sandwich or joint graduate degrees and programmes. The majority of staff have either attained scholarships or paying half payment as a result of collaborations between institutions. Numerous memoranda of understanding have been signed between higher education institutions in Uganda and those in other regions where the majority of academic staff have opted to offer their degrees in Doctor of Philosophy (Mulumba, Obaje, Kobedi & Kishun, 2008). Others have trekked to Britain, Scandinavian countries and the Far East.

The academic staff educated abroad are very instrumental in establishing research collaborations with their fellow colleagues or professors in the universities where they offered their graduate studies. This scenario is very common in science related disciplines at Makerere University. The shift from discipline based research to multidisciplinary research has made collaborative research more important than never before. The experiences gathered from abroad by academic staff seem to have had an impact on the curricula of various universities in Uganda. This is manifested in the various new courses and programmes that have been developed since the liberalisation of higher education in the 1990s (Mamdani, 2007). Many of the new programmes are geared towards providing graduates with skills and knowledge to operate in the global marketplace (Scott, 2006).
There are increasing prospects for universities in Uganda to internationalise and various fillers have so far been witnessed.

In order to re-position themselves in the academic world, some universities in Uganda have established international offices to coordinate and provide support their internationalisation activities. Regional and continental bodies such as the Inter University Council for East Africa (IUCEA) and the African Union (AU) are increasingly facilitating international students through formulating policies geared towards smooth mobility of students. Such regional and continental bodies have stepped up their funding for activities concerning internationalisation. Despite such opportunities, internationalisation still faces numerous challenges in Uganda.

Support for international students is still a major challenge. The services provided to international students do not conform to international standards. Students have to locate their accommodation, and some reside in slums such as Katanga and Bwaise for students in Makerere University, Banda for students in Kyambogo University, to mention but a few. Furthermore, computer laboratories and libraries are still are not adequately staffed with equipment and materials respectively. The internet connection is another cause to worry due to limited bandwidth. In spite of these challenges, internationalisation in Uganda has gradually taken root and continues to develop.

5.7 Conclusion
Much as the government has put in place plans and mechanisms to encourage research and innovation in the Universities, challenges still persist. According to the National Development Plan (Government of Uganda, 2010), inadequate focus on research and development, inadequate funding, brain drain, inadequate research and development personnel, and a weak collaboration between researchers and economic planners as well as institutions, industry and academia are some of the challenges leading to poor performance in research, science and technology innovation. With regard to collaboration, for example, there is little coordination between policy makers in higher education and those in economic planning. In terms of research and development personnel, Uganda has 1 researcher per a thousand members of the workforce. This is low compared to 5-18
researchers per a thousand members of the workforce in the OECD countries (Bailey et al., 2012).

The national research policies, structures and systems are quite sufficient and can steer research, innovation and development in higher education institutions and other national and institutional research sectors. International collaborations and academic staff exchange in Uganda have facilitated research in higher education institutions more than never before. Research has redefined higher education institutions particularly the universities. A university is no longer viewed as a training ground for key professionals and the educated elite but instead perceived to be primarily economic engines of advanced societies whose future wealth is now based upon knowledge (Clancy & Dill, 2009). The shift from the traditional view of a university to a much more inclusive one has greatly impacted universities in Uganda. Universities in Uganda are migrating from their primary role of teaching and training to encompass research and development. This shift has started a journey towards research-led universities despite the challenges of meager resources and brain drain.

The progress of universities in Uganda is low (Bailey et al., 2012). These tertiary institutions have weathered a lot of challenges that are slowing the fast development of universities. Research has indicated that for progressive growth to occur a lot of emphasis has to be put in research to obtain meaningful development (Bailey et al., 2012).

For meaningful development, the government of Uganda needs to provide enough funding to the universities. In the past this tertiary institutions have received poor attention in terms of funding leading to poor performance in research. The laboratory facilities’ and library are research facilities that contribute enormously to research development. There is need for universities to link with private sector like banks and industrial organizations to fund research projects because they stand to benefit from the output of innovations. Foreign research centers should also link with Ugandan colleges through networking and exchange programmes to come up with solutions to problems and challenges facing Ugandans. There is also need for the government to improve in infrastructural
development, more colleges and private universities should be set up to ensure that transmission of knowledge is moving to the suburbs.

Universities staff should be well enumerated to curb the rampant issue of knowledge drain faced in Uganda. It has been noted that due to poor salaries and lack of research funding, lectures are exporting their talent to foreign countries where there is green pasture. Human manpower at the university level should be invested on in terms of seminars, workshops, and exchange programmes with well performing institutions to ensure that they are up to date with the current technology.

Universities should provide source of their own funding through instituting consultancy services and income generating activities through providing environment for research by other organization that would pay for the facilities used. This will enable them not to be over dependent on grants. External grants should also be considered as a source of funding. Proposals should be tabled to seek funds from the government and to develop the country.

The heart of learning and research in universities are good library which is well equipped with the latest teaching, reference materials, good storage facilities of research materials. This will enhance progressive learning and research to take place. The laboratories also need be up to date with latest science apparatus to enable Ugandan learners competing with other universities in terms of research.

In conclusion, Ugandan universities should be agents of technological innovation as well as economic growth and development. As such, the universities should generate and domesticate knowledge by diffusing it into the economy through linkages with the private sector. To play this role effectively, the universities need not focus only on the production of graduates but also to drive community development, working directly with their host communities to address critical development problems such as unemployment, poverty, hunger, food insecurity, and to carry out social renewal.
References


