

Southern African Regional Universities Association

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OPENING ACCESS TO KNOWLEDGE IN SOUTHERN AFRICAN UNIVERSITIES

Research Study Final Technical Report

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1. Synthesis

SARUA, in collaboration with the IDRC, initiated a research study to investigate the issues of 'access to knowledge' constraints in Southern African Universities and the role and potential contribution of Open Access Frameworks and initiatives for research and dissemination. Eight universities in seven countries were selected to participate in this multi-country, cross-sectional study. A qualitative approach to the analysis of semi-structured interview data was used to investigate the existing constraints of access to knowledge. The study found that the key constraint to accessing knowledge is a lack of awareness of what has been produced in the regions, which is exacerbated by the limited capacity to make research available online. Moreover, the publishing criteria used to determine promotion and reward further serve to steer the publishing patterns of researchers into disseminating research results in international accredited journals which are often not available or affordable to universities in the region.

The study found that 71% of respondents are aware of open access (OA) approaches to disseminating knowledge and that the majority of interviewees were in support of OA. Notwithstanding the support for the introduction of OA to promote access to knowledge, respondents did raise a number of concerns pertaining to the quality of open access material that is not peer-reviewed; e.g. copyright, plagiarism and recognition for research output. The study also found that experiments with OA are already underway in universities, but that these initiatives face considerable challenges to successful introduction into the mainstream of university life and practice. It was found that a favourable university policy environment, as well as effectively funded institutional and technical capacity, is needed in order to promote sustainable implementation of initiatives to enhance scholarly publishing and dissemination in the region.

The report proposes a new framework that is based on open knowledge approaches to knowledge production, publishing and dissemination in response to the identified constraints and challenges to a productive academic research and publishing sector. The adoption of a proposed *Vision for Open Knowledge* in southern African universities and the establishment of a research publishing and dissemination platform are an integral part of such a framework. These proposals will form the basis of a sustained campaign to promote the establishment of a regional research publishing and dissemination platform, subject to discussion and endorsement by SARUA and its members.

2. Research problem

Current levels of research and publishing in Southern African universities and production and introduction of new knowledge into teaching and broader society are considerably lower than what are required to meet the developmental needs of countries in the region. It is, therefore, important that universities understand the potential contribution open access can make, not only to scholarly publication, but rather, to changing the way research is conducted and disseminated. Open Access recognises that greater access to publicly-funded scholarly research is necessary for accelerating knowledge transfer in the context of university missions. The study focused on issues of 'access to knowledge' constraints in Southern African universities and the role and potential contribution of Open Access Frameworks and initiatives for research. It explored the views, perceptions and attitudes of respondents to create a picture of the key concerns they have in respect of constraints to accessing and disseminating knowledge. The specific research questions for investigation were:

1. What are the existing constraints to availability of academic and other relevant research publications in the social sciences and humanities, the health sciences and the natural sciences and engineering?
2. Are Southern African universities changing their practices relating to production and dissemination of research and publications and, if so, how?
3. How can Southern African universities increase the availability of academic and other relevant research publications to students and researchers?
4. What measures would be required to encourage new approaches to knowledge production and dissemination in Southern African universities among librarians, research managers and prominent researchers/scientists?
5. How can open access benefit and contribute to scientific collaboration and endeavour, and what are its implications for research across higher education institutions throughout the region, given the current limitations confronting Southern African Universities?

3. Research findings

It was found that the lack of awareness of what is produced in the region serves as a major constraint to accessing research undertaken in the region. Research produced in the region tends to be poorly organised, not indexed and not made available electronically. The predominance of unpublished research and scientific output, often dismissively referred to as 'grey literature,' does not lend itself to electronic discovery processes and, as a consequence, is not accessible. The lack of capacity to make research available online further exacerbates the situation. The publishing criteria used to determine promotion and reward further serve to steer the publishing

patterns of researchers into disseminating research results in international accredited journals which are often not available to universities in the region. Researchers prefer to publish in international journals rather than journals produced in the region due to perceptions of poor quality. Trust and confidence in local journals are further adversely affected because many journals are perceived to be published irregularly or fail to remain in existence.

A significant proportion of respondents (71%) are aware of open access approaches to disseminating knowledge. The majority of interviewees were in support of open access, of which a large proportion (77%) indicated that they explicitly support the introduction of open access. Notwithstanding the support for the introduction of open access to promote access to knowledge, respondents did raise a number of concerns pertaining to the quality of open access material that is not peer-reviewed; copyright, plagiarism and recognition for research output. Respondents expressed concern about the quality of open access material, particularly when it is not peer-reviewed. Respondents are plagued by uncertainties pertaining to intellectual property rights in the electronic environment. It emerged that respondents are not clear about where ownership is vested in the context of institutional repositories in particular. A fear of plagiarism was identified as having a further negative influence on the attitude of respondents to open access. Moreover, uncertainty over whether open access published research will be afforded the same recognition in university promotion policies serves to hinder the uptake of open access. Given all these constraints it was difficult for some academics to conceive of how open access would be operationalised in their respective university environments.

Experiments with open access are already underway in some universities, but face considerable challenges. Issues that need to be addressed for the successful implementation of open access projects and an open knowledge paradigm include a favourable university policy environment, as well as effectively funded institutional and technical capacity.

The research report proposes a new framework that is based on open knowledge approaches to knowledge production, publishing and dissemination in response to the identified constraints and challenges to a productive academic research and publishing sector. The adoption of a proposed *Vision for Open Knowledge* in Southern African Universities and the establishment of a research publishing and dissemination platform are an integral part of such a framework.

The findings significantly further the existing understanding about the key constraints to accessing knowledge for research and teaching, and how they may be addressed. Policy makers, university managers and academia more broadly can draw on the findings to develop effective policy and operational responses to address these constraints.

4. Fulfilment of objectives

The more than 66 universities in Southern Africa fulfil their missions in diverse environments and settings, each with its particular opportunities, constraints and resources. The primary project objective of broadening the current understanding in regard to constraints to knowledge for research and teaching in universities is therefore vital for developing responses that can effectively address such constraints. In this respect, the project achieved considerable success. Not only do the results provide a sound basis for the development of possible interventions, the process of implementing also provided an opportunity for different stakeholders to interact within the frame of developing appropriate responses to address the constraints identified in the research.

An initial methodology workshop served as the main capacity building platform for introducing the seven young researchers from the region, recruited to undertake the fieldwork in the respective countries. At the workshop, the researchers were introduced to the key concepts underpinning the open access approach as well as the methodology used in the study¹. These young researchers could serve as focal points for future research studies and development projects in their respective countries.

5. Project design and implementation²

The project consisted of three phases. The **first phase** was the project initiation and planning phase. This phase was important for establishing the parameters within which the project would be implemented, and clarifying the governance and management arrangements underpinning the project. The **second phase** focused on refining the methodology with specific reference to conceptual framework for the research design, analysis and development of the research instruments. This was followed by the completion of the fieldwork, data capture and analysis, the preparation of the research report and the communicating the research results as part of the advocacy activities. The **final phase** of the project was aimed at handing over the research data and results and concluding the project from an administrative perspective. The project should be viewed as part of a number of other projects initiated by the IDRC and other funding agencies³ aimed at deepening and broadening understanding in respect of the adoption of open access at institutional, national, and regional levels.

¹ See Appendix 1 and Appendix 2.

² See Appendix 1.

³ Such as Publishing and Alternative Licensing in Africa (PALM Africa) funded by the IDRC, Opening Scholarship Project funded by the Shuttleworth Foundation, and the Publishing Matrix funded by the Shuttleworth Foundation and the Open Society Institute.

6. Project outputs and dissemination

The following outputs were produced during the research process:

Output	Description
1. Methodology Workshop Report	A record of the proceedings of the methodology workshop held with researchers.
2. Conceptual Framework and Research Design	Describes describes the conceptual building blocks that provide the framework within which the study is located, and describes the key elements of the research design. The document also incorporates the sample of respondents and contains the research instruments.
3. Opening Access to Knowledge in Southern Africa: Framework for the Southern African Regional Universities Association	The report proposes a new framework that is based on open knowledge approaches to knowledge production, publishing and dissemination in response to the identified constraints and challenges to a productive academic research and publishing sector. This is based on the findings of the research study presented in the second part of the document.

SARUA recognises that the extent to which the recommendations made in the research study and framework will be implemented, is dependent on how effectively it is able to mobilise the energies and resources of its member universities and other stakeholders. In view of this, SARUA will consider initiating a sustained campaign to communicate the emerging paradigm and proposals for growing research intensity and knowledge production in the region. The campaign would have three (3) components:

1. Publication of Framework on 'Opening Access to Knowledge in Southern African Universities'.
2. Workshop with SARUA member institutions.
3. Scholarly publication – a 2009 'Open Access' thematic edition of the Southern African Journal of Information and Communications, a Department of Education (South Africa) accredited journal.

The workshop will be the first event of this campaign. The purpose of the workshop is to discuss the proposals on the establishment of a regional research and publishing dissemination platform in the context of the research paradigm of the 21st century. The workshop will provide an opportunity for participants to step outside their existing institutional paradigms and grapple with the possible future states of research and scholarly communication in the region. The workshop will further provide an opportunity for participants to assess and prioritise the different options and proposals for the establishment of the regional research publishing dissemination platform. These inputs may be incorporated into a more detailed implementation plan applicable over the next several years.

The proposal for a thematic edition of the Southern African Journal of Information and Communications (SAJIC) is based on the growing interest in how ICT and the Internet is creating a new environment for universities in the regional context. This 2009 edition of the SAJIC proposes to address the main theme of “open access, research dissemination and scholarly publishing in the Internet age”.

7. Capacity-building

The Southern African Regional Universities Association (SARUA) has embarked on a series of initiatives to increase the understanding of the current realities and the challenges for universities in the region. These challenges relate to the future of research, teaching and community engagement. Early research studies include the 2007 studies on *Science, Engineering and Technology* and *ICT Infrastructure*. The study on *Access to Knowledge in Southern African Universities* provides a welcome and important contribution alongside the 2007 studies and addresses the question of scholarly publishing and dissemination. Scholarly publishing and dissemination is a necessary mechanism to foster the growth of science and technology research in Southern Africa. The study will form the basis for a major capacity building initiative over the next several years that seeks to build regional capacity for the establishment of a research publishing and dissemination platform.

In addition, the researchers involved in the study have developed basic capacities to research open access issues in higher education as a result of their participation in the study. Their future involvement in studies and initiatives of this nature could further strengthen their existing capacity.

8. Project management

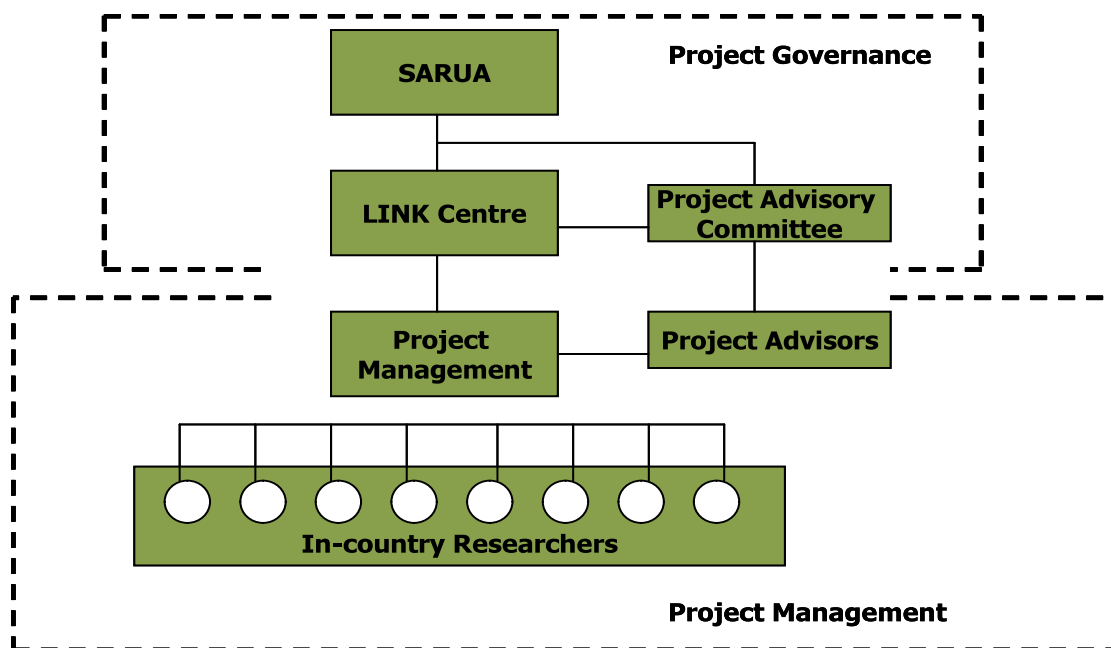
The project governance structure was comprised of representatives from SARUA (Ben McGarry) and the LINK Centre (Lucienne Abrahams), the project advisors, (Eve Gray and Andrew Rens) and the project manager (Mark Burke). Together, they constituted the Project Advisory Committee. The Project Advisory Committee (PAC) met at the completion of each phase of the project to review the deliverables and provide guidance on the activities for the next phase of the project. The role of the PAC also included ensuring that the necessary resources were made available for project implementation, major issues were resolved, risks were identified and measures implemented to mitigate such identified risks.

The LINK Centre was contracted to implement the project and was responsible for overseeing the implementation of the project. This oversight role included reviewing and quality assuring deliverables, managing risks and resolving issues. The LINK

Centre appointed a project manager who was responsible for implementing the project.

The project advisors consisted of resource persons with extensive knowledge and expertise in the Open Access environment. They were responsible for providing advice on the planning and execution of the project. SARUA provided excellent administrative support to ensure the smooth running of the project. Diagram 1 illustrates the governance and management arrangements.

Diagram 1: Project Governance and Management Arrangements



9. Impact

The findings of the study will be disseminated to the more than 66 universities in the 15 countries of SADC, for discussion. In addition, it will hopefully serve as the basis for initiatives to establish a regional publishing and scholarly communication platform in partnership with a range of institutions. The platform is intended to enhance public research output and increase the levels of scholarly communication in ways that support the social and economic development needs of countries in the SADC region.

A longer term measure of the impact of the project will be the size and shape of any advocacy campaign that SARUA may undertake, the emergence of a successful regional platform as proposed in the study, and the tangible uptake of open access principles and the establishment of open access policies and procedures in universities in Southern Africa.

10. Overall assessment

The research project was the stimulus for a series of ideas about the ways in which SARUA and/or its members might address the gap in knowledge production and dissemination in member universities in the region. It provided an important opportunity to assess the specific conditions relevant to universities in the region so that potential solutions might be tailored to the circumstances in which these universities operate. The study further mobilised people from different disciplinary and professional backgrounds to consider the existing constraints to research and knowledge and to begin to think about tackling them in a practical but also systematic way.

The project has been very well managed, and its technical execution has been appropriate and successful, and well within budget.

11. Recommendations

Initiatives that touch on the core values and mission of universities have to be undertaken in a careful, sensitive and strategic manner. Universities in Southern Africa are under tremendous pressures and face what often appear to be overwhelming challenges, especially when it comes to taking their places internationally.

Intellectual enthusiasm is not enough for a programme or new way of thinking to succeed; a socio-cultural approach is also needed. The question of introducing open access approaches to knowledge production and scholarly communication requires a multipronged approach that involves a variety of dimensions within the institutional culture and setting of the university.

Consultation, inclusion, sensitivity, as well as innovation, advocacy and determination are the leading watchwords.

APPENDIX 1

Conceptual Framework and Research Design

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12. Introduction and Background

Knowledge production, communication and dissemination is becoming central to the mission for all universities in the 21st century, thus enabling a shift beyond teaching towards research and civic engagement. The Internet and other collaborative technologies are changing the way universities conduct their business by making it possible to conduct collaborative research across disciplines, institutions and countries; making it possible for researchers and students to share working research and publications online; and to promote e-learning for undergraduate and post-graduate programmes.

This creates the opportunity for African universities to participate in global knowledge production activities with significant potential gains through, inter alia, increased resources for research and publication in local and international academic journals. For institutions operating in developing countries within resource constrained environments such as SARUA member institutions, these technologies and associated practices offer tremendous opportunities for improving the research, publishing and dissemination processes and putting Southern African knowledge at the service of local economies and societies. The critical question is whether we are positioning our institutions to take advantage of these opportunities.

This question can only be answered if we understand the present constraints to knowledge production, processing and dissemination within our universities and the extent to which collaborative technologies and its associated practices can contribute to increasing our capacity for generating knowledge and expanding existing knowledge. The rise of open approaches to scientific endeavours and research are closely associated with open source technologies, open access, open data, open research for example, can significantly contribute to generating knowledge within our institutions.

SARUA has, in collaboration with the International Development Research Centre (IDRC), launched a research study entitled *Opening Access to Knowledge in Southern African Universities* to study the issues of 'access to knowledge' constraints in Southern African Universities and the role and potential contribution of Open Access Frameworks and initiatives for research.

The first section of the document describes the conceptual building blocks that provide the framework within which the study is located, while the second describes the key elements of the research design.

13. Conceptual Framework

The conceptual framework intends to serve as an organising principle for transforming fragmentary information into a structured and meaningful whole. It seeks to provide conceptual coherence, and a framework for the collection and analysis of the data. The constituent concepts of the framework are the emergence of the knowledge society, the role of universities in the knowledge society, the contribution of universities to knowledge production, open frameworks and approaches to knowledge production and its relevance to universities in Southern Africa. A frame of references for the study is constructed using these concepts.

2.1. *The Emergence of the Knowledge Society*

International and multilateral development agencies brought the increasing importance of information and knowledge for improving the quality of life and achieving sustained economic growth into sharp focus at the beginning of the 21st Century⁴. Sociologist Manuel Castells (1998, p.356) ascribes this phenomenon to the three interdependent processes of the information technology revolution; the economic restructuring that took place as a consequence of the crisis of capitalism and statism; and the booming of cultural-social movements. He argues that the interaction between, and reaction to these processes gave rise to the network society and the informational economy. Castells describes this order as informationalism and asserts that under this order the generation of wealth, the exercise of power and the creation of cultural codes depend on the technological capacity, with information technology as the core of this capacity.

According to UNESCO (2005, p.27), the reason for the existence of the emerging global information society is to bring about a higher and more desirable goal, namely the building, on a global scale, of knowledge societies. It views information as a knowledge-generating tool, but notes that it is not knowledge itself and that a knowledge society emphasises the ability to produce and integrate new knowledge and to access information, knowledge, data and a huge range of know-how. Accordingly, knowledge societies are about capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development.

A concept associated with that of the knowledge society is the knowledge economy. It is used to communicate the idea that a fundamental shift in the nature of economic activity and the process of wealth generation is taking place. This shift is underpinned by a move from an economy in which the principle source of value was human labour to one in which knowledge is the principle component of value creation, productivity and economic growth - a shift in which innovation based on knowledge is the key source of competitive advantage. The Organisation for Economic Cooperation and Development (OECD 1996, p.7) describes it as 'economies which are directly based on the production, distribution and use of knowledge and information', while the World Bank (World Bank Institute 2004, p.4) defines it as 'one that utilizes knowledge as the key

⁴ See for example, World Bank (1999) *World Development Report 1998/99: Knowledge for Development*, and United Nations Development Programme (2001) *Human Development Report 2001: Making New Technologies Work for Human Development*.

engine of economic growth and in which knowledge is acquired, created, disseminated and used effectively to enhance economic outcomes.’

While some argue that societies throughout the ages relied on knowledge for social and material wellbeing, it is the accelerated processes and capacities for creating and disseminating knowledge that shapes the knowledge society and economy through a virtuous cycle in which the progress of knowledge and technological innovation produces more knowledge in the long term. For example, internationally recorded disciplined-based knowledge took 1,750 years from the start of the Christian era to double for the first time; since then it has doubled in volume every 150 years and subsequently every 50 years. Disciplined-based knowledge now doubles every five years and it is projected that by 2020 knowledge will double every 73 days. It is further estimated that the amount of information available in the world doubles every four years.⁵

Benkler (2006, pp.31-32) attributes the changes in the way information, knowledge, and culture is produced and exchanged to the distribution throughout society, of the high cost of capital necessary for gathering, working with, and communicating information, knowledge and culture. The high capital costs therefore, no longer serves as a barrier to entry, since ‘the capacity to make meaning—to encode and decode humanly meaningful statements—and the capacity to communicate one’s meaning around the world, are held by, or readily available to, at least many hundreds of millions of users around the globe’ (ibid., pg.33). These technical conditions of communication and information processing are enabling the emergence of new social and economic practices of information and knowledge production.

2.2. Universities in the Knowledge Society

Universities are regarded as knowledge organisations or centres of knowledge production and dissemination and therefore, these institutions are potentially positioned to play an important role in defining the character of the knowledge society. The profile of universities has been raised in recognition of the importance of research and the training of a highly skilled workforce in positioning a country in a global knowledge-based economy (Meek 2003, p.1). Universities contribute significantly to training competent and responsible professionals, and is the main site of both basic and applied research providing crucial support for national innovation systems and often, serving as the backbone of a country’s information infrastructure (World Bank 2002, p.23).

The ‘extraordinary acceleration of technological power and corresponding changes’ taking place in the broader knowledge society has had a significant impact on the dynamics of higher education systems’ (Floridi 1999, p2). According to Swartz (2006 p.133), the transformation in the global political and economic system ‘required a whole new set of institutional arrangements in the economy as well as social structures of knowledge production and reproduction in society’. Social structures such as universities, which play an important role in knowledge production, did

⁵ Cited in Bernheim, C.T & de Souza Chaui, M., (2003) *Challenges of the university in the knowledge society, five years after the World Conference on Higher Education*, UNESCO Forum Occasional Paper Series No. 4, available:

[http://portal.unesco.org/education/en/file_download.php/697c33597621cdab0b77507d31da8cf8Tunterm+an+\(English\).pdf](http://portal.unesco.org/education/en/file_download.php/697c33597621cdab0b77507d31da8cf8Tunterm+an+(English).pdf) [accessed 17 March 2008].

not escape the pressure to transform with reforms focusing on the production of new skills to support emerging industries, greater alignment between higher education and industrial growth strategies, and achieving closer synergy between government, industry and universities in supporting the transformation to a knowledge economy. These reforms are viewed by some as threatening the traditional public mission of the university and redefining it through the intermediary of the market to match the needs of the profit maximising goals of corporations (Lieberwitz 2006).

Nevertheless, the new demands are that universities are expected to contribute more directly with their knowledge in the effort to increase the innovative capacity and competitiveness of nations. The expectations are not only directed at the natural sciences and technology, but include also the social sciences and the humanities. These pressures and the advances in the information and communication technologies are rapidly transforming academia and how it carries out its scholarly mission of teaching, research and social engagement.

2.3. Universities and Knowledge Production

Knowledge is the foundation on which the three traditional missions of academic teaching, research and social engagement that is at the heart of the academic enterprise, is built. Academic teaching emphasises the transfer of knowledge from the academic to the student. Research focuses on conducting scientific and social science research and on publishing the results of the research. Community engagement tends to be limited to localities immediately bordering the university and is aimed largely at providing students with a platform for practical learning and testing the application of their theoretical knowledge (Abrahams 2005, p7).

Knowledge production and dissemination, underpinning the core activities of universities, are complex processes that occur through multiple interconnected and overlapping processes that are continuously evolving (PhillipsKPA: 2006). The evolving modes of knowledge production and associated research practices are described and analysed from different perspectives.

The Systems of Innovation approaches are systems and network models that are national, regional or sectorally based. This approach draws heavily on interactive learning and evolutionary theories of innovation; significantly influences Science and Technology (S&T) policy; defines organisations and institutions as the key components of the system; and regards knowledge as generated throughout the innovation process and system as learning (Houghton 2003; Haukka 2005).

From the Triple Helix perspective, the key institutions of university, industry and government form a layered network in a national innovation system that is characterised by a strong role of universities and other knowledge producing institutions; active engagement of all levels of government in formulating policies; strategic alliances of firms in developing and marketing new products, product and process innovation within industry which are complemented by techno-scientific innovation; and the emergence of science-based technologies that originated in academia and were encouraged by Government policies. The three institutional sectors of public, private and academia that previously worked separately are increasingly working together in a

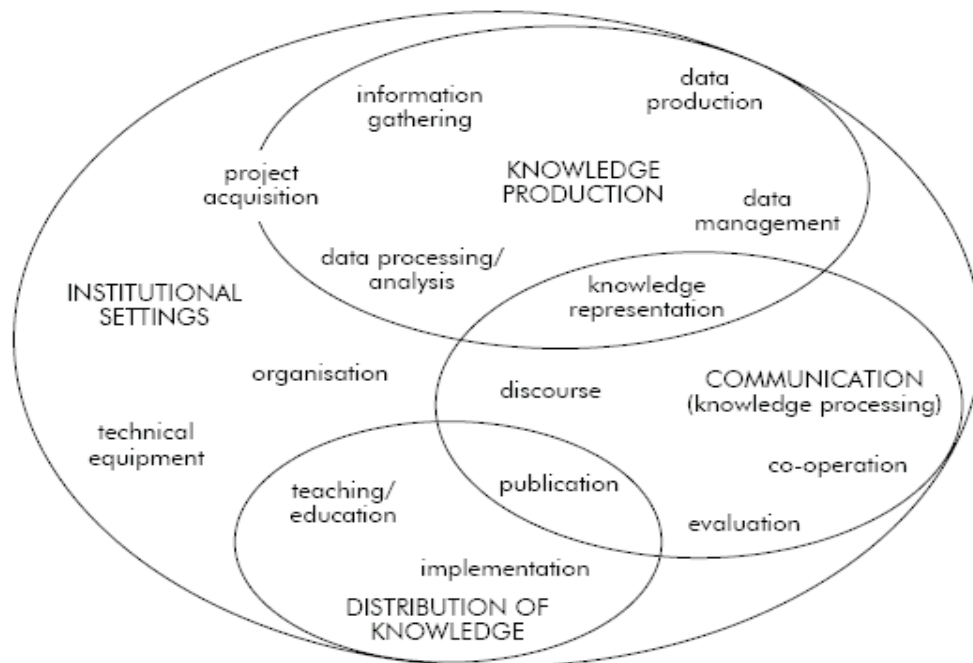
spiral pattern to form a triple helix with linkages emerging at various stages of the innovation process (Etzkowitz 1998).

In the New Production of Knowledge thesis, Gibbons (2000) describes the outcome of the increasing number of sites where competent research can be carried out and the ICT mediated interactions between these sites, as a socially distributed knowledge production system, also known as Mode 2 knowledge production.

These perspectives emphasise different aspects of the knowledge production and dissemination process and the roles of various actors. What is certain though, is that ICT affects practically all aspects of the knowledge production and dissemination enterprise resulting in the emergence a new mode of knowledge production. Houghton (2003, p.126) concludes that this mode of knowledge is increasingly characterised by greater emphasis on interdisciplinary, multidisciplinary, transdisciplinary research; enhanced diversity in the locations of research activities; an increasing focus on problems, rather than techniques; and more emphasis on collaborative work and communication. This in turn, creates new information access and dissemination needs, since there is an increase in the demand for access to a wider range of more diverse sources; for access mechanisms that cut across disciplines; and for access to, and management of non-traditional, non-text objects.

In order to investigate and understand the constraints to knowledge within the production and dissemination cycle, it is necessary to categorise, define and scope the types of scholarly activity that is undertaken in this process. Nentwich (2003, p.22) distinguishes between knowledge production, knowledge processing and knowledge distribution. These processes take place within an institutional setting that requires technical and organisational set-up, as depicted in Figure 1:

Figure 1: Scholarly activities and framework conditions



(Source: Nentwich 2003)

Nentwich considers three categories of institutional factors that impact the knowledge production and dissemination processes. Firstly, general coordinates refer to framework conditions within the legal, political and disciplinary environments. Secondly, economic factors such as the budgetary situation pertaining to libraries and research units, as well as the cost of publishing play an important role. Finally, cultural parameters such as publishing traditions within the different science families and the culture of production will influence the knowledge production process.

Knowledge production refers to the research processes related to information gathering, data production, analysis and management. ICT's enable the production of data sources in new forms such as data banks and metadata from research texts. Researchers have access to more information as a consequence of the digitization of scientific work. Digitization further provides new possibilities for data mining and analysis such as software programmes for statistics or text analysis that create new links and correlations or expert systems that automate complex parts of the process of arriving at scientific conclusions. An example is the Human Genome Project, where the analysis of the human genome was made possible through the automation of analysing routines. Computers aid data generation in significant ways through, for example, performing calculations, modelling and simulations (Pfeffer 2003).

Knowledge processing or communication refers to scholarly communication involving knowledge representation, discourse, evaluation and cooperation. Communication and collaboration is fundamental to the research process (Houghton 2003, p.76). Email is the most common use of the Internet and it is the basis for more complex applications such as mailing lists and newsgroups, and plays a crucial role in research teams and networks. Increasingly,

technologies such as desktop-based publishing and videoconferencing play an important role at all levels of research. Emerging grid computing technologies support geographically and institutionally distributed research projects, especially complex and multidisciplinary projects (ibid., p.138). These technologies offer a virtual space in the Internet for the storage of electronic materials and tools for various kinds of interaction in a limited community, both of which can be accessed anytime from any place.

Knowledge distribution refers to publication, implementation and teaching. Teaching is regarded as the rapid transmission of knowledge, and as noted by Duderstadt (2002:58), 'the real power of digital technology can be achieved only when we take advantage of the shift from the one-to-many character of broadcast media, to the many-to-many ability of digital networks'. This could provide the basis for a shift from passive lecture courses distributed on CD-ROMs, streamed from Internet Web sites or beamed via satellite broadcasting with little or limited interactivity to computer-based collaboration involving the use of computer conferencing, electronic mail and threaded discussions. Publication is regarded the nucleus of formal communication among academics and serves a multiplicity of purposes that include (Nentwich 2003, p36):

- *Certification*, that is the "quality stamp" given by the community;
- *Registration*, which records a research result and relates it to particular authors (including the "time stamp" for priority claims);
- *Diffusion*, that is the distribution (communication) of academic knowledge including awareness building;
- *Transparency*, that is the disclosure of results with a view to both legitimise the research, to allow for connecting research and to open it for control and re-assessment;
- *Discourse*, as a publication is one element of a wider on-going communication process in the research communities; and finally
- *Preservation*, i.e. archiving and building up the memory of academia.

There has been a particular focus on developing more open information and knowledge access structures over the last several years, mainly due to the increasing control of multinational publishers in scientific and scholarly publishing and rapidly rising content charges. These initiatives include the development of pre- and e-print archives, and the development of free, publicly accessible journal article collections⁶. Through the development and promotion of standards that facilitate the dissemination of content and open access to it, *The Open Archives Initiative*⁷ has played a significant role in the establishment of open access digital repositories for both self-archiving and institutional archiving.

⁶ For example, in physics (arxiv.org) and in medicine (www.pubmedcentral.nih.gov).

⁷ See www.openarchives.org

2.4. Knowledge Production through Open Data, Open Research and Open Access

Knowledge is both an output and an input, since knowledge is applied to knowledge in the process of producing knowledge (Houghton 2003). Hence, the ability to access knowledge and to disseminate and communicate it is vital for the knowledge production process.

Scientific and knowledge-based communities are especially receptive to the proliferation of efficient and specialised dissemination of information and knowledge. The Academy of Sciences of South Africa (ASSAf 2006, p.81) notes that 'Science, or building of shared objective knowledge about the world, is a collective human endeavour, and the advent of the connected cyberworld has emphasized this more forcefully than ever before'.

The genesis of open models and frameworks in support of research and scientific endeavours can be traced to the Open Source Software (OSS) movement. OSS is characterised by the availability of the source code, under a copyright license that permits users to use, change, and improve software. The public and collaborative development process 'bears striking similarities to the fundamentally deregulated, flexible and self-organising nature of the process of scientific publishing' (Shiltz et al 2005).⁸ The open source software development model, together with the arrival of new definitions of information and ownership, as presented in the Creative Commons Licenses, have provided the basis for the emergence of commons based approaches, frameworks and models for open data, research and access.

Open Data⁹ is a philosophy and practice requiring that certain data is freely available to everyone, without restrictions from copyright, patents or other mechanisms of control and is often focussed on non-textual material such as maps, genomes, chemical compounds, mathematical and scientific formulae, medical data and practice, bioscience and biodiversity. Open Research¹⁰ is scientific research encompassing the natural, social sciences and humanities and is conducted in the spirit of free and open source software in which the clear accounts of the methodology, data and results are made available on the Internet. Open Access¹¹ is defined as the free, immediate, permanent, full-text, online access, for any user, web-wide, to digital scientific and scholarly material, primarily research articles published in peer-reviewed journals. Such commons-based modes of knowledge production rely on access, rather than exclusion (Kerloff 2006). These open approaches, frameworks and models hold significant opportunities for supporting knowledge production, processing and dissemination in universities in Africa.

2.5. Universities, Access to Knowledge Constraints and Open Approaches

⁸ Schiltz, M., Verschraegen, G., Magnolo, S., (2005) 'Open Access to Knowledge in World Society?' *Soziale Systeme* 11(2005), Heft 2, S. 346 – 396, available <http://www.soziale-systeme.ch/pdf/Schiltzet al.pdf> [accessed 25 March 2008]

⁹ http://en.wikipedia.org/wiki/Open_data

¹⁰ http://en.wikipedia.org/wiki/Open_research

¹¹ http://en.wikipedia.org/wiki/Open_access

According to the Task Force on Science, Technology, and Innovation (2005), 'A nation's ability to solve problems and initiate and sustain economic growth depends partly on its capabilities in science, technology, and innovation.' Increasingly, it is acknowledged that science, technology, and innovation (STI), need to go beyond generating new, integrated knowledge towards actively applying this knowledge to real world problems, helping decision-makers evaluate the possible benefits and pitfalls of different response options, and facilitating implementation of required actions, if its full potential is to be realised (International Council for Science 2005).

Developing countries, especially in Africa, face a broad spectrum of research infrastructure and capacity constraints that limits their capability to produce scientific output, and absorb scientific and technical knowledge. Unequal access to information and knowledge by developing nations that is exacerbated by unequal development and exchange in international trade, serve to reinforce the political and cultural hegemony of developed countries. The impact of knowledge-based development will continue to have insignificant impact for as long as this asymmetry in research output and access to up-to-date information remains (Chan, L., & Costa, S. 2005).

One of the major priorities for addressing Africa's development challenges therefore, should be knowledge production by African researchers working primarily at African institutions, focusing on locally relevant knowledge production. According to Sawyerr (2004, p.218), this insistence 'on African research and researchers at African institutions is to ensure rootedness and the sustainability of knowledge generation, as well as the increased likelihood of relevance and applicability. This condition presupposes local institutions and an environment adequate to support research of the highest calibre and insists upon the rootedness of such research as well as its positive spill-over effects on the local society'.

The contribution universities can make to scientific knowledge production and application places these institutions at the centre of knowledge-based development efforts, particularly in Africa. According to Saweyrr (2004), 'the strength of Africa's universities and research institutions is a key condition for its development, and their weakness is an index of, as well as a contributor to, its poverty'.

Scholarly publishing is important for disseminating and validating research results and moreover, provides an indication of the knowledge production and research capacity of countries and regions. Sub-Sahara Africa has a low publication rate relative to other developing regions, and suggests a 'problem of knowledge diffusion for the region and possibly low knowledge generation' (Ondar-Okemwa 2007). Gray (2006) argues that if Africa is to meet its urgent development needs the marginalization of African research produced by African, out of Africa would need to be reversed.

Open access approaches, frameworks and models promise to create opportunities for the participation of African universities in global knowledge production activities at the service of local economies and societies. Open approaches are premised on the conception of information and knowledge as a public good, rather than a commodity that, as Lyotard (1984 p.5) foretold, will be produced in order to be sold; is and will be consumed in order to be valorised in a new

production.’ As a public good, it gives rise to open institutional innovations and practices that lead to socially efficient outcomes. As a commodity over which intellectual property rights are assigned, it conveys a monopoly right that prevents ideas from being used to satisfy the needs of society (David 2002, p.6). In the resource scarce environments in which African universities find themselves, the institutions and practices based on the ‘knowledge as commodity’ conception will further adversely affect access to knowledge since the resources are not available to pay for knowledge as a commodity. In addition to this fundamental constraint, a range of environmental and institutional factors specific to African universities impact its knowledge production capabilities.

The onset of economic decline and fiscal problems in the 1970s and 1980s associated with the introduction of structural adjustment in many countries in Africa, left African universities without much needed resources to carry out research. According to Assie-Lumumba (2005), university systems from the late 1970s to the 1990s was characterised by a great instability, with numerous lost years, strikes by both students and teaching staff, and confrontations between students, faculties, administrations, and governments, often followed by sporadic or prolonged closures. Infrastructure such as libraries, bookstores and research facilities collapsed; a serious shortage of books, laboratory equipment and research funds was experienced; and conditions of inadequate teaching personnel and poor staff development and motivation prevailed.

Ondari-Okemwa (2007) categorises constraints specific to knowledge production and dissemination into economic (inadequate funding and budgetary cuts, lack of incentives, brain drain) technological (Internet connectivity and telecommunications infrastructure) and environmental factors (freedom of expression). Kanyengo (2006) identifies the non existence of information policies for handling information, poor ICT infrastructure to manage the preservation of knowledge resources, inadequate financial resources, and the lack of technical knowledge and legal barriers as the key impediments to preserving information resources as inputs into knowledge production.

In spite of these constraints, taking full advantage of the new electronic forms of communication for research and research capacity building in Africa, could open up access to knowledge and research findings worldwide, and present exciting opportunities for plugging African researchers into a flexible knowledge system and enabling them to leapfrog to the frontiers of knowledge (Sawyerr 2004: 227).

14. Research Design

The research study is a multi-country, cross-sectional study aimed at investigating and exploring the issues of access to knowledge constraints in Southern African Universities and the role of open approaches to research and science cooperation. The outcome of the research is expected to form the basis for policy advocacy at the institutional, country and regional level in relation to knowledge production and knowledge sharing in the 'digital commons' context.

The elements of the research design include the specific research questions, the methodology and conceptual model, data collection methods and sampling, and data collection and analysis, as described below:

3.1. Research Objectives

The specific research questions that will be investigated are as follows:

- What are the existing constraints to availability of academic and other relevant research publications in the social sciences and humanities, the health sciences and the natural sciences and engineering?
- Are Southern African universities changing their practices relating to production and dissemination of research and publications and if so, how?
- How can Southern African universities increase the availability of academic and other relevant research publications to students and researchers?
- What measures would be required to encourage new approaches to knowledge production and dissemination in Southern African universities among librarians, research managers and prominent researchers/scientists?
- How can open access benefit and contribute to scientific collaboration and endeavour, and what are its implications for research across higher education institutions across the region, given the current limitations confronting Southern African universities?
- How feasible is the establishment of a SARUA regional open access network(s) based on an "open knowledge charter", and the development of a Science Commons? What are the options for doing so?

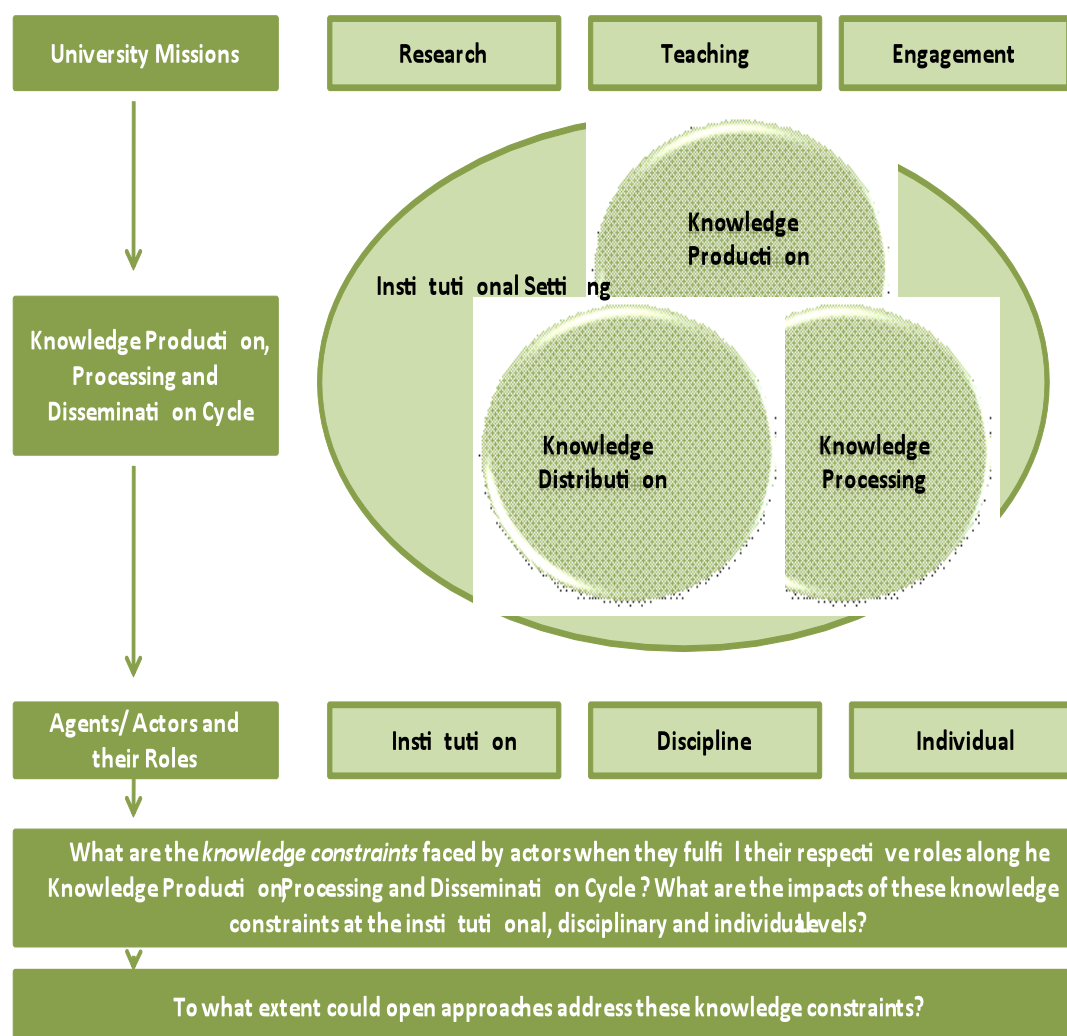
3.2. Methodology and Conceptual Model

Social constructionist theory informs the methodology for the study. This approach takes as its point of departure the development of social phenomena in specific social contexts, and places emphasis on how knowledge is constructed through social relationships and interactions.

The study is framed within the context of how knowledge production enables the achievement of the research, teaching and engagement mission of universities. More specifically, the knowledge chain is viewed from a process perspective consisting of knowledge production, processing and dissemination processes, which take place in a university institutional environment. Each of these processes and the institutional environment are impacted by the increasing pervasiveness of

modern information, communication and networking technologies. These technologies in turn, contribute to and provide the impetus for the emergence of new modes of knowledge production, processing and dissemination. The emergence of open approaches and frameworks is one such institutional innovation that takes advantage of the embedded networking and collaboration properties of such technologies and that could, contribute to addressing existing knowledge constraints. The study therefore, seeks to investigate the existing knowledge constraints experienced at the institutional, disciplinary and individual levels within the knowledge cycle, while at the same time determining the extent to which open modes of knowledge production can assist in addressing these constraints. The model is illustrated in Figure 2.

Figure 2: Complete Conceptual Model



3.3. Data Collection Methods

The study will employ a combination of descriptive and explanatory methods, using literature review and semi-structured interviews to generate the data. The purpose of the literature review is to identify and explore the core concepts underpinning changing knowledge production processes within the context of the university mission. These concepts provided the basis for the formulation of the conceptual framework, illustrated in Figure 2. The semi-structured interviews will provide an opportunity for key informants to describe and explain their views on the research questions.

3.4. Sampling

Eight universities¹² from seven countries have been selected to participate in the study. A purposive sampling approach was used to select the key informants situated within pre-defined criteria for the study. The criteria used in formulating the categories of respondents were information-rich and knowledgeable people involved in science and research within a university context. More specifically, respondents were selected based on their positions in respect of university institutional structures and disciplinary structures. The sample of respondents for each university is as follows:

Table 1: Sample of Key Informants at University

Institutional Respondents	Health and Life Sciences	Health and Life Sciences	Social Sciences and Humanities
DVC Research	Dean/ Head	Dean/ Head	Dean/ Head
Head: Library Sciences	Researcher/ Scientist	Researcher/ Scientist	Researcher/ Scientist
Case Study	Academic	Academic	Academic

3.5. Data Collation and Analysis

Researchers will be appointed in each of the countries from which the universities were selected. The data collection process will take place over an eight week period. Researchers will be expected to record the interviews in digital format. The recorded interviews will then be transcribed and together with the detailed notes of each researcher on each interview, will form the basis for the content analysis. A number of categories and elements will be defined as the basis for coding the data and analysis thereof.

¹² University of Botswana, Eduardo Mondlane University, University of Malawi, University of Mauritius, University of Tanzania, University of South Africa, University of Pretoria, University of Zambia

15. Conclusion

The Conceptual Framework and Research Design is intended to serve as a guide on the approach and structure of the research study by framing the research and developing shared understandings of the key concepts the study seeks to explore.

References

- Abrahams, L., (2005) *South African Higher Education in the 'Knowledge Economy': Visions and Vignettes towards the Future*, available: http://www.triplehelix5.com/pdf/A309_THC5.pdf [accessed 20 January 2008].
- Academy of Sciences of South Africa (2006) *Report on a Strategic Approach to Research Publishing in South Africa*, available: http://www.assaf.co.za/strat_report.html [accessed 02 December 2007].
- Assie- Lumumba, T., (2005) 'Critical Perspectives on African Higher Education', *JHEA/RESA* Vol. 3, No. 3, 2005, pp. 1–29, available http://www.codesria.org/Links/Publications/jhea3_05/assie_lumumba.pdf [accessed 20 January 2008].
- Benkler, Y., (2006) *The Wealth of Networks*, Yale University Press: Yale and New York also available: http://www.benkler.org/Benkler_Wealth_Of_Networks.pdf [accessed 18 March 2008]
- Bernheim, C.T & de Souza Chaui, M., (2003) *Challenges of the university in the knowledge society, five years after the World Conference on Higher Education*, UNESCO Forum Occasional Paper Series No. 4, available: [http://portal.unesco.org/education/en/file_download.php/697c33597621cdab0b77507d31da8cf8Tunnerman+\(English\).pdf](http://portal.unesco.org/education/en/file_download.php/697c33597621cdab0b77507d31da8cf8Tunnerman+(English).pdf) [accessed 17 March 2008].
- Castells, M. (1998) *The Information Age: Economy, Society and Culture. Volume III. End of the Millennium*, Blackwell: Oxford.
- Chachage, S. L. (2006) 'The University as a Site of Knowledge: The Role of Basic Research', *JHEA/RESA* Vol. 4, No. 2, 2006, pp. 47–67, available: http://www.codesria.org/Links/Publications/jhea2_06/chachage.pdf [accessed 04 January 2008].
- Chan, L., & Costa, S., (2005) 'Participation in the Global Knowledge Commons: Challenges and opportunities for research dissemination in developing countries'. *New Library World* 106 (1210/1211) 141 – 163.
- Chen, D., & Dahlma, C. (2006) *The Knowledge Economy, The KAM Methodology And World Bank Operations*, World Bank Institute, available: http://siteresources.worldbank.org/WBI/Resources/The_Knowledge_Economy-FINAL.pdf [accessed 15 January 2008]
- Gibbons, M., (2000) 'Universities and the New Production of Knowledge: Some Policy Implications for Government', in Kraak, A., ed., *Changing Modes: New knowledge production and its implications for higher education in South Africa*, HSRC Press: Cape Town.
- Gray, E., (2006) 'At the South Eastern Frontier: The Impact of Higher Education Policy on African Research Publication'. Paper delivered at the *CODESRIA-ASC Conference on Electronic Publishing*

and Dissemination September 6-8, 2006, Leiden, The Netherlands, available:
www.policy.hu/gray/docs/ASC_Codesria_conference_paper.doc [accessed 04 February 2008].

Duderstadt, J. J., Atkins, D. E. and Van Houweling, D., (2002). *Higher Education in the Digital Age: Technology Issues and Strategies for American Colleges and Universities*, American Council on Education and Praeger Publishers, Westport, CT.

Etzkowitz, H. (1998). The Triple-Helix of Academia-Industry-Government: The U.S. National Innovation System. In R. Anderson, T. Cohn, C. Day, M. Howlett & C. Murray (eds.), *Innovation Systems in a Global Context* (pp.127-147). Quebec: McGill-Queen's University Press.

Floridi, (1999) *Philosophy and Computing: An Introduction*, Routledge: London.

Haukka, S. (2005) *Research training and national innovation systems in Australia, Finland and the United States*, unpublished thesis (Phd.) RMIT University, Melbourne, Australia, available http://www.intcap.com/downloads/ICS_Article_2005_National%20Innovation%20Systems%20-%20Finland,%20Sweden%20and%20Australia%20Compared.pdf [accessed 19 March 2008].

Houghton, J. W., (2003) *Changing Research Practices in the Digital Information and Communication Environment*, Department of Education, Science and Training, Australian Government available http://www.dest.gov.au/NR/rdonlyres/AC17B809-3896-46E2-920A-0FD5CA29F843/1424/c_res_pract.pdf [accessed 20 January 2008].

International Council for Science (2005) *Harnessing Science, Technology, and Innovation for Sustainable Development*. A report from the ICSU-ISTS-TWAS Consortium ad hoc Advisory Group, available http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLopen_accessD/584_DD_FILE_Consortium_Report.pdf [accessed 04 February 2008].

Kerloff, K., (2006) *Access to Knowledge in a Network Society: A Cultural Science Perspective on the Discussion on a Development Agenda for the World Intellectual Property Organisation*, unpublished thesis (M.A.) Universität Lüneburg available <http://nearlyfreespeech.org/downloads/a2k.netsoc.pdf> [accessed 20 January 2008].

Kanyengo, C. W., (2006) 'Managing Digital Information Resources in Africa: preserving the integrity of scholarship', Paper delivered at the CODESRIA-ASC Conference on Electronic Publishing and Dissemination September 6-8, 2006, Leiden, The Netherlands available: www.ascleiden.nl/Pdf/elecpublconfkanyengo.pdf [accessed 05 December 2007].

Lieberwitz, R. L., (2006) 'Expanding Global Access to Knowledge: The Role of the University', Paper presented to the *Knowledge, Economy and Management Congress*, Kocaeli, Turkey, November 3 – 6, 2006.

Meek, V. L., (2003) *Market Coordination, Research Management and the Future of Higher Education in the Post-Industrial Era*, UNESCO Forum Occasional Paper Series No 5, available: <http://unesdoc.unesco.org/images/0013/001341/134121e.pdf> [accessed 17 January 2008].

Nentwich, M., (2003) *Cyberscience: Research in the Information Age*, Austrian Academy of Science Press: Venna.

Ondar-Okemwa, E., (2007) 'Scholarly publishing in sub-Sahara Africa in the twenty-first century: challenges and opportunities', Paper presented at the *PKP Scholarly Publishing Conference*, available: http://pkp.sfu.ca/files/Scholarly_publishing_in_sub.pdf [accessed 04 December 2007].

Organisation for Economic Cooperation and Development (1996) *Knowledge Based Economy*, available: <http://www.oecd.org/dataoecd/51/8/1913021.pdf> [accessed 09 February 2008]

Pfeffer, T., (2003) *Virtualisation of Research Universities: Raising the Right Questions to Address Key Functions of the Institutions*, Centre for Studies in Higher Education, University of California, Berkeley available: <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1015&context=cshe> [accessed 22 March 2008].

PhillipsKPA (2006) *Knowledge Transfer and Australian Universities and Publicly Funded Research Agencies*, A Report to the Department of Education, Science and Training, Australian Government, available: www.dest.gov.au/.../36818C20-9918-4729-A150-464B662644B3/12630/Knowtran_FinalCompilation_005_web1.pdf [accessed 20 January 2008].

Sawyerr, A., (2004) 'African Universities and the Challenge of Research Capacity Development', *JHEA/RESA* Vol. 2, No. 1, 2004, pp. 213–242, available: http://www.codesria.org/Links/Publications/jhea1_04/sawyerr.pdf accessed [20 January 2008].

Schiltz, M., Verschraegen, G., Magnolo, S., (2005) 'Open Access to Knowledge in World Society?' *Soziale Systeme* 11(2005), Heft 2, S. 346 – 396, available <http://www.soziale-systeme.ch/pdf/Schiltzetel.pdf> [accessed 25 March 2008]

Swartz, D, (2006) 'New pathways to sustainability: African universities in a globalising world', in Nkomo, M., Swartz, D. & Maja, B. (eds), *Within the realm of possibility: from disadvantage to development at the University of Fort Hare and the University of the North*, HSRC Press, Cape Town.

UNESCO, (2005) *Towards Knowledge Societies*, available: <http://unesdoc.unesco.org/images/0014/001418/141843e.pdf> [accessed 04 February 2008].

United Nations Development Programme (2001) *Human Development Report 2001: Making New Technologies Work for Human Development*, available: <http://hrd.undp.org/en/media/completenew1.pdf> [accessed 04 February 2008].

UN Millennium Project (2005) *Innovation: Applying Knowledge in Development*. Task Force on Science, Technology, and Innovation, available: www.unmillenniumproject.org/documents/Science-complete.pdf [accessed 03 December 2007].

World Bank (2002) *Constructing Knowledge Societies: New Challenges for Tertiary Education*, available:

http://siteresources.worldbank.org/EXTAFRREGTOPTEIA/Resources/Constructing_Knowledge_Societies.pdf [accessed 20 January 2008]

World Bank (1999) *World Development Report 1998/99: Knowledge for Development*, available: <http://www.worldbank.org/wdr/wdr98/contents.htm> [accessed 04 February 2008].

Annexure A: Invitation Letter

[Insert Name of Respondent]

[Insert Title of Respondent]

[Insert Respondent Address]

[Insert Date]

Dear [Insert Name of Respondent]

**RE: SARUA OPENING ACCESS TO KNOWLEDGE IN SOUTHERN AFRICAN
UNIVERSITIES RESEARCH PROJECT**

SARUA has, in collaboration with the International Development Research Centre (IDRC), launched a research study entitled *Opening Access to Knowledge in Southern African Universities* to study the issues of 'access to knowledge' constraints in Southern African universities and the role and potential contribution of Open Access Frameworks and initiatives for research. The [Name of University] University has been selected to participate in this exciting research project.

Up to thirteen key informant interviews will be conducted at each participating university, targeting different discipline and competencies. You have been selected to participate in the study as a respondent within the [Category of Sample] sample.

The project is a qualitative research study that will be implemented in a sample of seven countries in the Southern African region over a ten month period. The study will assess the current situation pertaining to access to knowledge constraints in Southern African universities and the role of Open Access Frameworks and initiatives for research and scientific collaboration. The specific questions that form the basis for the investigation are as follows:

- What are the existing constraints to availability of academic and other relevant research publications in the social sciences and humanities, the health sciences and the natural sciences and engineering?
- Are Southern African universities changing their practices relating to production and dissemination of research and publications and if so, how?
- How can Southern African universities increase the availability of academic and other relevant research publications to students and researchers?
- What measures would be required to encourage new approaches to knowledge production and dissemination in Southern African universities among librarians, research managers and prominent researchers/scientists?
- How can open access benefit and contribute to scientific collaboration and endeavour, and what are its implications for research across higher education institutions across the region, given the current limitations confronting Southern African universities?

The outcome of the research is expected to form the basis for policy advocacy at the institutional, country and regional level with respect to knowledge production and knowledge sharing in the 'digital commons' context. In addition to encoding the outcomes of the research in

the form of a report that all universities and respondents will have access to once it is completed, the outcome of the research study is further aimed at informing the establishment of a network of researchers, practitioners, administrators and policy makers that will focus on addressing the identified access to knowledge constraints in Southern African universities.

Your participation in this study is voluntary and we would appreciate your involvement in this respect tremendously. We look forward to your support in making this endeavour a huge success.

Yours sincerely

PIYUSHI KOTecha
CHIEF EXECUTIVE OFFICER
SARUA

Annexure B: Interview Guides

Institutional Interview Guide: DVC Research

What are the research and publishing objectives of the University?

Probing Questions:

- What are the existing practices of research production and dissemination?
- What are the existing forms and means of access to research output and publications?
- Are the university's research and publishing objectives being met? How?
- What are the existing constraints to disseminating and accessing research output and publications?
- What are the national regulations that promote disseminating and accessing research output and publications?
- What are the national regulations that constrain disseminating and accessing research output and publications?

What are the current practices for research utilisation in the University?

Probing Questions:

How are Southern African researchers, teachers and students using African research:

- In curriculum development?
- In further research?
- In social/ community engagement?

Is Southern African research accessible in the University?

Probing Questions:

- How accessible is research from the Southern African region to your university for the purposes of research, teaching and community engagement?
- Is your research readily available to other Southern African universities for the same purposes?
- What are the difficulties that you encounter in accessing research?
- What are the difficulties that you encounter in making available research?
- How does the University encourage the growth of research output and dissemination (policies, structures, practises, other)?
- Does your institution have an Intellectual Property policy or rules?

What approaches are being introduced to grow research output and dissemination?

Probing Questions:

- Is your university considering any of the following measures to encourage research and dissemination?
 - Changes to the academic promotion and reward system
 - Funding
 - Staff development
- Are you aware of, and are you considering introducing Open Approaches to Knowledge production and dissemination among librarians, research managers and prominent researchers/scientists?
 - If yes, how do you think they would benefit your institution?
 - If no, what do you see as the challenges?
- What measures would you like to introduce to grow research output and dissemination in your institution that could be supported by a SARUA initiated open knowledge network?

Institutional Interview Guide: Library Services

Does the library play a role in promoting and publishing research within the University?

Probing Questions:

- What role does the library play in research production and dissemination?
- How does the library contribute to the achievement of research and publishing objectives of the university?
- Are you successful in making this contribution? How?
- What are the existing constraints to disseminating and accessing research output and publications?
- What are the university policies and regulations that promote disseminating and accessing research output and publications?
- What are the university policies and regulations that constrain disseminating and accessing research output and publications?

Is Southern African research accessible in the University?

Probing Questions:

- How accessible is research from the Southern African region to your university for the purposes of research, teaching and community engagement?
- Is your research readily available to other Southern African universities for the same purposes?
- What are the difficulties that you encounter in accessing research?
- What are the difficulties that you encounter in making available research?
- How does the library encourage the growth of research output and dissemination (policies, structures, practises, other)?
- Does your institution have an Intellectual Property policy or rules?

What approaches are libraries using to promote access to research?

Probing Questions:

- Are you aware of, and are you considering introducing Open Approaches to research and dissemination among librarians, research managers and prominent researchers/scientists?
 - If yes, how do you think they would benefit your institution?
 - If no, what do you see as the challenges?
- Do you support open approaches to research and dissemination?
- Does the library provide online access to electronic resources (local, international)?
- Do these online resources include national and African resources?
- Does the capacity of the university computer network allow online access to electronic research publications?

- Does the library participate in any way in the publication or dissemination of research output from your university, through institutional repositories or otherwise?
- If yes, describe the ways in which the library promotes access to these electronic resources?

Institutional Interview Guide: University Press/ Publisher

What do you see as your press' role in respect of promoting research and disseminating research output within the university?

Probing Questions:

- What does the university see as your role in promoting scholarly publication and the dissemination of research output?
- Is your press a unit of the university or do you have an independent governance structure?
- What are the challenges associated with your relationship with the university, and how does it affect your ability to promote research and disseminate research output?
- Is there a link between the press and the library? If there is, please describe this link.
- What are the university policies and regulations that promote or constrain scholarly publication and dissemination of research output?

Is the university research output accessible through your press?

Probing Questions:

- How accessible are your publications to universities in the Southern African region?
- What are the difficulties that you encounter in making available your publications?
- How does the press encourage the growth of research output and dissemination (policies, structures, practises, other)?
- Does your press have an Intellectual Property policy or rules, and how does it affect publication of research output?

What approaches are your press using to promote scholarly publication and the dissemination of research output?

Probing Questions:

- Are you aware of, and are you considering introducing Open Approaches to Knowledge production and dissemination among librarians, research managers and prominent researchers/scientists?
 - If yes, how do you think they would benefit your institution?
 - If no, what do you see as the challenges?
- Do you support open approaches to scholarly publication and the dissemination of research output?
- Does the press provide (or are you considering providing) online access to electronic resources (local, international)? Who pays for making these resources accessible electronically?

- Does the press participate in any way in the publication or dissemination of research output from the university, through institutional repositories or otherwise?
- If yes, describe the ways in which the press promotes access to these electronic resources?

Interview Guide: Dean

What are the research and publishing objectives of the Faculty?

Probing Questions:

- What are the existing practices of research production and dissemination?
- What are the existing forms and means of access to research output and publications?
- Are the university's research and publishing objectives being met?
- What are the existing constraints to disseminating and accessing research output and publications?
- What are the policies and regulations that promote disseminating and accessing research output and publications?
- What are the policies and regulations that constrain disseminating and accessing research output and publications?

What are the current practices for research utilisation in the Faculty?

Probing Questions:

How are Southern African researchers, teachers and students using African research:

- In curriculum development?
- In further research?
- In social/ community engagement?

Is Southern African research accessible in the University?

Probing Questions:

- How accessible is research from the Southern African region to your Faculty for the purposes of research, teaching and community engagement?
- Is your research readily available to other Southern African universities for the same purposes?
- What are the difficulties that you encounter in accessing research?
- What are the difficulties that you encounter in making available research?
- How does the University encourage the growth of research output and dissemination (policies, structures, practises, other)?
- Does your institution have an Intellectual Property policy or rules?

What approaches are being introduced to grow research output and dissemination?

Probing Questions:

- Is your university considering any of the following measures to encourage research and dissemination?
 - Changes to the academic promotion and reward system

- Funding
 - Staff development
- Are you aware of, and are you considering introducing Open Approaches to Knowledge production and dissemination among librarians, research managers and prominent researchers/scientists?
 - If yes, how do you think they would benefit your institution?
 - If no, what do you see as the challenges?
- What measures would you like to introduce to grow research output and dissemination in your institution that could be supported by a SARUA initiated open knowledge network?

Interview Guide: Academic

How do the research and publishing activities support teaching and learning provision of the Faculty/School/Department?

Probing Questions:

- What is the relationship between research, publications and teaching?
- To what extent do research publication and output support teaching activities?

What are the current practices for research utilisation in the Faculty/ School/ Department?

Probing Questions:

How are Southern African researchers, teachers and students using African research:

- In curriculum development?
- In further research?
- In social/ community engagement?

Is Southern African research accessible in the University?

Probing Questions:

- How accessible is research from the Southern African region to your Faculty/ School/ Department for the purposes of teaching?
- Is your research readily available to other Southern African universities for the same purposes?
- What are the difficulties that you encounter in accessing research for teaching activities?
- How does the University encourage the growth of research output and dissemination (policies, structures, practises, other)?
- Does your institution have an Intellectual Property policy or rules?

What approaches are being introduced to grow research output and dissemination?

Probing Questions:

- Are you aware of, and are you considering introducing Open Approaches to Knowledge production and dissemination among librarians, research managers and prominent researchers/scientists, and how this can support your teaching and learning activities?
 - If yes, how do you think they would benefit your institution?
 - If no, what do you see as the challenges?
- Do you support open approaches to research and dissemination?
- Does the Faculty/ School/ Department provide online access to electronic resources (local, international)?

- Do these online resources include national and African resources?
- Does the capacity of the university computer network allow online access to electronic research publications?
- Does the Faculty/ School/ Department participate in any way in the publication or dissemination of research output from your university, through institutional repositories or otherwise?
- If yes, describe the ways in which the Faculty/ School/ Department promotes access to these electronic resources?
- What measures would you like to introduce to grow research output and dissemination in support of teaching and learning in your Faculty/ School/ Department that could be supported by a SARUA initiated open knowledge network?

Interview Guide: Senior Researcher/ Scientist

What are the research and publishing objectives of the Faculty/School/Department?

Probing Questions:

- What are the existing practices of research production and dissemination?
- What are the existing forms and means of access to research output and publications?
- What are the existing constraints to disseminating and accessing research output and publications?
- What are the policies and regulations that promote disseminating and accessing research output and publications?
- What are the policies and regulations that constrain disseminating and accessing research output and publications?

What are the current practices for research utilisation in the Faculty/ School/ Department?

Probing Questions:

How are Southern African researchers, teachers and students using African research:

- In curriculum development?
- In further research?
- In social/ community engagement?

Is Southern African research accessible in the University?

Probing Questions:

- How accessible is research from the Southern African region to your Faculty/ School/ Department for the purposes of research, teaching and community engagement?
- Is your research readily available to other Southern African universities for the same purposes?
- What are the difficulties that you encounter in accessing research?
- What are the difficulties that you encounter in making available research?
- How does the University encourage the growth of research output and dissemination (policies, structures, practises, other)?
- Does your institution have an Intellectual Property policy or rules?

What approaches are being introduced to grow research output and dissemination?

Probing Questions:

- Is your university considering any of the following measures to encourage research and dissemination?

- Changes to the academic promotion and reward system
 - Funding
 - Staff development
- Are you aware of, and are you considering introducing Open Approaches to Knowledge production and dissemination among librarians, research managers and prominent researchers/scientists?
 - If yes, how do you think they would benefit your institution?
 - If no, what do you see as the challenges?
- Do you support open approaches to research and dissemination?
- Does the Faculty/ School/ Department provide online access to electronic resources (local, international)?
- Do these online resources include national and African resources?
- Does the capacity of the university computer network allow online access to electronic research publications?
- Does the Faculty/ School/ Department participate in any way in the publication or dissemination of research output from your university, through institutional repositories or otherwise?
- If yes, describe the ways in which the Faculty/ School/ Department promotes access to these electronic resources?
- What measures would you like to introduce to grow research output and dissemination in your Faculty/ School/ Department that could be supported by a SARUA initiated open knowledge network?