Role Of Reliable Policies In Promoting Research And Knowledge Management: The African Context

Bwalya Kelvin Joseph, University of Botswana.

ABSTRACT:

Many countries the world over have appreciated the role of research and Knowledge Management (KM) in their socio-economical development. African governments, just like any others all over the world, have a duty to incorporate into their public policies and knowledge-related activities the UN's Millennium Declaration as a framework for knowledge society. This paper presents an ad hoc survey looking at endeavours done towards establishing research as a public good in Botswana, Zambia and Malawi. It brings out lessons learnt on how research can or cannot contribute to national development, and further establishes the niche of research and effective knowledge management as a tool toward shaping a nation on the competitive edge in the global value chain. Incorporation of the research and knowledge management agenda into national policies is not an easy thing to do, as a lot of challenges are evident from case studies where this has been tried.

Keywords: *Socio-economic development, Knowledge management, Policy, Research, Zambia, Malawi, Botswana*

1. Background And Introduction

There have been many definitions of research in literature. Stone (2002) treats research as a codified, scholarly and professional mode of knowledge production that has its prime institutional loci in universities, policy analysis units of government departments or international organizations and private research institutes and produced by academics, think tank experts and development professionals. With this view, he looks at research as a stimulus to aid affluent policymaking contrary to the view taken by this paper where it ascertains that for research to thrive there is need to have appropriate policies in place. Research aims to investigate, learn and produce knowledge by gathering information, contemplation, trial, and/or synthesis (Shankland, 2000). For example, in an international development context, that may involve action-research or academic study ranging, as examples, from a pilot project, to a laboratory experiment, a consultation exercise, a quantitative survey, a literature review, participant observation or a participatory evaluation. Mchombu (2002) further opines that research should be social development oriented especially in developing countries in order to be a catalyst in the development process.

Further, Crewe & Young (2002) give a balance between research and policy and how the two are intertwined. They ascertain that research and policy defy neat separation but can be conceptually distinguished by their goals and methods. In its entirety, research produces knowledge (whether by, as examples, action-research or academic study); policy aims for continuity or change of a practice (stretching from the statements on intent to the development of policy in practice). In this regard, Crewe & Young supports this paper's accession on the link between research and policy. It is thus suffice to say that if policy aims for continuity or change in a practice; it is likely to change the research culture and its contribution to the body of knowledge and society at large if sound policies are in place. Crewe & Young (2002) further looks at different strategies for influencing policy makers and researchers have to take account of the various bureaucratic pressures limiting and enabling them, as well as those who commission or fund research. These factors are streamlined along the following themes: a) the urge to simplify: due to resource shortages, b) 'gigantism': the bigger the budget, the greater the status, c) inflexible long-term project planning, and d) fierce competition for funding: discouraging collaboration).

If sound policies favoring research are in place, it is suffice to mention that there will be adequate knowledge sharing which will in turn transform into tangible socio-economic development of a nation. Many authors have defined knowledge management in different ways. Newman (1991) defined knowledge management as a collection of processes that govern the creation, dissemination, and utilization of knowledge in an organization. It involves the management of explicit knowledge (i.e. knowledge that has been codified in documents, databases, web pages, etc.), and the provision of an enabling environment for the development, nurturing, utilization and sharing of employees' tacit knowledge (i.e. know-how, skills, or expertise). It is to be mentioned that ideally, a research policy agenda should encompass new economic institutions and cultures, new technology paradigms and the ICT infrastructure, national and regional innovation systems – and human capital, or the knowledge, skills and other attributes of the workforce (OECD, 1997).

To firmly comprehend the discussion in this paper, let's also look at the layman meaning of the terms 'policy' and 'policy analysis'. The theory of public policy has been around for several $decades now as it can be traced from 1950s and the era of the early 'think tanks', such as the Rand Corporation and the Brookings Institution in the USA, and very probably to prewar writing (Smith, 1991; Weiss, 1992). Recently, there has been so much interest from different fields in trying to understand how policy decisions are made and the implications of the said policies on the socio-economic field and correspondingly how the policy decisions are taken and how these are justified empirically, intellectually and ideologically. Shankland (2000) ascertains that policy aims for continuity or change of a practice, including plans and their evolution when put into practice (that is, the 'how' as well as the 'what' of decisions. He further goes on to state that 'Public' policy is usually led by practitioners within organizations, rather than private policies which are negotiated at the level of communities or households.

Although many authors have emphasized strategies on how research outputs should be made available to the policymakers so that the research findings are incorporated into policy, it is also important to investigate how appropriate policies can influence development of research undertakings. Africa in general has recognized the role of sound policies in promoting research and development. This can be evidenced by the many commitments to provision of an enabling environment done by the African leaders in many different contexts such as the Cape Town Declaration on research for sustainable development in July 2002

(Ngubane, 2002). In 2002, ministers responsible for research, science and technology in the African, Caribbean and the Pacific (ACP) Group of States met in Cape Town and devoted to address priority issues of research for sustainable development, including the social, environmental, economic, cultural, and political aspects in the ACP states. Out of this meeting, it was recommended that sound policies favoring the nurturing of research on all corners of the ACP be encouraged.

Different policy interventions in different African countries are evident: Many countries at the moment are trying to revamp their information communications technology (ICT) infrastructure so that there can be easy and almost costless sharing of information in this knowledge age. One initiative of revamping the ICT infrastructure is massive investments by Africans in deploying optical fibre networks, erecting efficient national network backbones, liberalization of ICTs and telecommunications gateways, etc. This is the case because, for example, fibre optic cable which provides a cheaper option than satellite is scarce in Africa. Where it is available costs are kept high by monopolistic ownership structures whose main goals are commercial rather than developmental (RCARENI, 2005). Another example for commitment by Africans to promote research is that of South Africa where the Health Research Policy (HRP) has been developed to promote the practice and conduct of research that contributes towards the improvement of the human health and welfare of the South African population. The HRP attempts to create a framework and environment for health research to contribute effectively to health development, and for evidence to lead to policy formulation (HRPSA, 2001). The recent past has also seen Botswana seeing researchers and research institutions mushrooming thanks to the initiatives that are now being put in place. Generally Botswana has not had a well established system of funding research (Moahi, 2007). As is the case in Africa and elsewhere, many countries tend to encourage research and development by developing national research strategies and by providing avenues for funding. Such a system is crucial because the presence of funding bodies tend to determine the research strategy and focus (Moahi, 2007). This being the case, as good as it may be, there are other countries in Africa that have not shown considered commitment towards the advancement of research in their respective countries.

As aforementioned, many studies taken have emphasized the influence of research on policy (Stone, 2002; Graham, 2004). However, this paper takes an inverse approach as it looks at how appropriate policy can create an enabling environment for research and knowledge sharing to thrive. Appropriate policies would encompasses strategic initiatives (e.g. putting up of fibre networks for easy and faster data transfers, appropriate research funding mechanisms, developing a reliable human resource base, etc.) by authorities and the public sector for the sole purpose of encouraging research and knowledge dissemination. Fortunately, this paper is not just about a compilation of melancholic facts, but rather seeks to present its findings from the case studies in a unique way by presenting an overall feel of the research and policy environments in Botswana, Zambia and Malawi. The next section looks at the different case studies to substantiate the role of evidence-based policies for research and knowledge sharing development.

2.   Case Studies

2.1.   Botswana

Botswana's government has realized that for research to thrive, there is supposed to be proper policies that support its development. Research and efficient knowledge management and sharing paradigms are the most important cornerstones to the survival of a country in this knowledge age. The University of Botswana (UB) acts as the pioneer institution in forging ahead the research agenda and has benefited greatly from the fiscal policies that the government has put in place. This is further compounded by the resident research and development policies at UB which encourage and reward excellence in research, innovation and development, builds research capacity, generates resources, and builds knowledge (UB Research Policy). This has seen UB researchers contributing much to national development by making known and available most of their research findings.

Considerable effort has been made by Botswana National Research, Science and Technology Plan towards making good policies for research. The plan highlights the outline of priority investment areas in research including how these priority areas will meet Botswana's national goals, e.g. contribution to Vision 2016 (BNRST, 2005). The case is also made in the literature that the difference in the income of countries is more attributable to knowledge than to physical and human capital and that innovation and productivity increase is more important in national competitiveness than GDP growth. This would suggest the need for greater investment in research and development, education and information technology than in physical plant and equipment and the adoption of measures to prepare the country for greater globalization and competition. To foster this shift, Botswana can learn from other countries such as Korea, Malaysia, Finland, etc., specifically in formulating a policy framework to provide the following incentives: a) economic incentives and an institutional regime that provides incentives for the efficient use of existing and new knowledge and support for entrepreneurship; b) educated, creative and skilled people; c) a dynamic information infrastructure particularly to get information to rural and poor communities; and d) an effective national innovation system (BNRST, 2005).

As information communications technology (ICT) lie at the center of knowledge dissemination and management, it is important that any country that intends to promote research and shift towards a knowledge-based economy should have a defined ICT infrastructure. Towards this course, Botswana has come up with an ICT initiative and has succinctly expressed their desire for a research sound economy in the 1996 ICT bill which is now under implementation with the modified bill, the Maitlamo ICT bill of 2007. The 1996 ICT bill is based on the following principles:

> ➢   the establishment of an independent regulatory body;

> ➢   the modification of license issued to incumbent telecom operators; and

> ➢   the development and adoption of standards in the quality of telecommunications services (UNECE Report, 2002).

> ➢   The Maitlamo ICT bill is the most dedicated policy initiative that the Botswana government, private partners and the general public have made towards the enculturation of ICTs.

Within the policy framework, Botswana has come up with policies that aim to have properly-trained workforce that will be proper researchers and knowledge generators and managers who would help in overcoming future challenges that the country may face. Several policies and acts of parliament have been put in place to accelerate the development of research institutions such as the

research-oriented Botswana International University of Science and Technology (BIUST), Botswana Institute for Development Policy Analysis (BIDPA), the set-up of the National Commission for Science and Technology (NCST), and other complementary institutions such as the Botswana Research Science and Technology Investment Agency (BRSTIA).

The science and technology (S&T) policy of 1998 gives priority to strengthening telecommunications infrastructure and the use of ICTs, and attracting women to professions and careers in the field of science and technology. It proposes an umbrella under which S&T development in the country can be undertaken. It is to be noted that, for Botswana's environment, although recently there have been large breakthroughs in encouraging research, as of 1998, the laws governing research were over-protective. (Mazonde, 1998). This entails that if this has not yet been done, i.e. the relevant regulatory frameworks for research have not taken care of this, it is important that legislation and conducive environment for research is put in place.

Given its limited human resource base at present, Botswana has put in place some initiatives to have an enabling research environment in place. It is however, worthy noting that proper regulatory frameworks and follow-up programs have to be drawn to promote the culture of research in as much as Botswana would like to be considered as an upcoming knowledge-based economy. Comparatively with other Sub-Saharan African states, Botswana's effort towards encouraging research and knowledge management is in focus and better than most of these countries.

The next section continues sampling of the research and knowledge management environment in Zambia.

2.2. Zambia

Zambia has concentrated much on revamping agriculture sector and many policies have been put in place to make sure this is realized. This is because, for a long time, agriculture has been the second economic mainstay. Even as of now, although very few people will mention the need to delve towards transcending towards a knowledge-based economy, this is not part of policy. Surprisingly, although this is the case, the evolution of agricultural research and development policy in Zambia is emblematic of the quiet crisis in African agricultural research. This potential has not been realized because of post-independence national policies that involved a suite of state interventions, which became unsustainable with falling copper revenues.

Elliott & Perrault (2002) give the following policy thrusts which were supported by the Ministry of Finance agreed to revamp and uphold the development of the agricultural sector in Zambia:

> ➢ Need for liberalization of the agricultural markets by relying on market-based prices for all crops, privatizing agricultural parastatals, and removing trade barriers or restrictions.

> ➢ Increase the role of the private sector by privatizing companies, seeking cost recovery, or privatizing services outright.

> ➢ Diversify agricultural production by shifting from maize to groundnuts, soybeans, tobacco, cotton, horticulture, and floriculture.

> ➢ Improve services to smallholders through research, extension, credit, and land tenure

> ➢ Improve the economic status of women through access to credit, extension, land tenure, and other services.

> ➢ Make better use of available natural resources by accelerating land registration, increasing investment in infrastructure, and permitting land subdivision to create a market in land.

> ➢ Ensure food security by creating a food reserve for transitory insecurity and a financial mechanism to finance imports.

With such policy interventions, it has been seen that the agriculture sector has been improving steadily. Despite this being the case, the sector has not improved at such a high rate given the level of commitment from both the public and private sector. This may partly be attributed to low penetration of ICTs in the research circles. It is anticipated that if ICTs and other telecommunications policies were deliberately put in place, there would be evident knowledge distribution and sharing of experiences in the agriculture sector. The economic mainstay in Zambia has been the mining industry. It is anticipated that this should have engulfed the use of ICTs at an earlier stage and consequently spill over the technology to other socio-economic sectors. However, this has not been the case as most of the mining business processes have been done manually.

ICTs sit at the center of the knowledge-age and countries that need to transform to knowledge-based economies should adopt ICTs as a tool for national competitiveness. This has to be coupled with proper ICT infrastructure and a learned human resource base would retrieve value from the use of ICTs. The Zambia Telecommunications Act (ZTA) set up in 1994, placed Zambia in a leading role as an African country in the use of information and communication technology. After the Act, the Communications Authority of Zambia (CAZ) was created which was tasked with the role of making an implementation follow-up to the recommendations of the ZTA, issue telecommunications service and supplier licenses, and oversees the growth of the telecommunications industry of Zambia. The ICT policy was just launched in 2007 and its full-scale implementation is yet to be seen.

With the absence of as defined ICT policy implementation and a questionable national backbone network infrastructure the cost paid for any transfer of information is huge. This being the case, research becomes very expensive as access to information is subsequently expensive. Also information sharing is not realized as such sharing of experiences will not be entertained. Zambia has some policies promoting research particularly for the agricultural sector, with less emphasis on other research sector potentials. Apart from the public National Center for Scientific Research and the Zambia Association for Research and Development, there are no vibrant institutions for research in Zambia. Even the University of Zambia has placed itself as a traditional teaching university with very limited research endeavors. This can be partly attributed to lack of policies targeted at developing the research industry in Zambia.

2.3. Malawi

Despite massive underdevelopment, Malawi has always had sound fiscal policies in place in support of research. Traditionally, Malawi is an agricultural country just like Zambia discussed above. Early post independence policies supported significant government involvement in the smallholder agricultural sector in areas of production, extension, technology development and marketing of agricultural produce. Subsequent post independence policies saw the government being oriented towards poverty reduction. It was only after independence that the country put in strategic policies to move from an agriculture-based to knowledge economy. Although this has not been reached as of yet, so much has been done towards the same. To encourage free thought and participation in information generation and management, Malawi introduced a local language, Chichewa, to be used in primary and high schools in a bid to encourage ordinary Malawians pursue education (Chilora, 2000). This was vested upon government's understanding of the value of education to national development and development of an informed human resource base.

In Malawi, there have been many interventions done to put in place policies that favor research and the development of knowledge management paradigms. One such initiative was the action of the Executive Board of the African Capacity Building Foundation (ACBF) which, in 2007, approved a Grant of US$ 1.5 million, to support the Malawi Macroeconomic Policy Research and Analysis Project (MPRAP). The goal of the project was to strengthen public policy research and analysis in Malawi. The specific objectives of the project were to build Malawi's national capacity in public policy research and analysis to support policy makers and other stakeholders, build the capacities of other national research institutions in Malawi and provide technical support and advisory services to non-state actors in policy research and analysis, and so forth (MPRAP, 2008). Another initiative is the National Malaria Control Program (NMCP) which functions under the Directorate of Preventive Health Services in the Ministry of Health. The NMCP sets the policies that encourage research and sharing of experiences in malaria research in Malawi. The NMCP also enhances institutional capacity for high-quality multidisciplinary health-related research by housing support units for research training in medical, nursing and other health-related institutions, aims to establish national small grants schemes for applied and basic health research and delves to strengthen laboratory infrastructure and training in national institutions.

There is also the National Research Council of Malawi (NRCM), which was created by presidential decree in 1974, and acts as a national apex body in the Office of the President and Cabinet responsible for the promotion and coordination of research in Malawi. Within its advisory role, NRCM is responsible for research policy matters at a national level. NRCM provides the general framework for the conduct of research in the nation. NRCM, in consultation with other stakeholders, develops national regulations, guidelines, procedures and measures for health-related research in Malawi. Sectoral ministries and institutions are encouraged to develop their own sector-specific research guidelines and policies to work in tandem with NRCM's umbrella regulations, guidelines and policies.

The Government of the Republic of Malawi has recognized and accepted the importance and role of ICT, in Malawi's socio-economic development. This recognition is seen in removal of import duty on computer sets in Government's establishment of Television Malawi (TVM); development and implementation of the Malawi Communications Policy; enactment of the Malawi Communications Act in 1998; development of Science and Technology policy; enactment of Science and Technology Act on 4 August 2003; the upgrade of analogue telecommunications to digital telecommunications equipment through Malawi Telecommunications Limited; liberalization of the telecommunications sector which has enabled proliferation of electronic financial services, and private broadcasting services. Furthermore, the conviction is demonstrated through Government's prioritization of ICT activities in the Malawi Poverty Reduction Strategy Paper, and in the corresponding Medium Term Expenditure Framework (MTEF), and in establishing the Malawi Communications Regulatory Authority (MACRA), (MICT 2003).

In 2002, Malawi started developing a new ICT Policy with the assistance of the ECA/UNDP (MICT, 2003). This was the extension of the idea initially outlined in the Integrated Socio-Economic and ICT Policy and Plan Development Framework for Malawi vested in the vision 2020 National Perspective Study document – Volume 1, Science and Technology Policy.

Other policies to develop a competent human resource base and to promote sharing of research outputs or any other developmental information included the Education Management Information System (EMIS) and Policy (funded by USAID); the Sustainable Development Networking Program (SDNP) whose aim was to provide connectivity in the form of E-mail and Internet Services; the ICT Policy Framework for Malawi which was the United Nations Economic Commission for Africa (UNECA) and UNDP initiative to come up with a framework, which a policy document can be based on; and the Government Wide Area Network (GWAN) which is a government network for ministries and all government departments and agencies.

It is worth noting that not much has been done to set up legal frameworks supporting the proliferation of research endeavors in Malawi; however, the institutional framework is solid considering the level of development.

3. Implications

As countries strive towards placing themselves as knowledge-based countries so that they can be effectively competent in this digital age, it is important that research and efficient knowledge management paradigms are put in place. The key to this shift is not only about building sophisticated research infrastructure or not only about building national capacity for biotechnology and information technology but the effective use of this knowledge across different socio-economic hierarchies generally getting this knowledge particularly to ordinary citizens such as mothers, farmers, workers, enterprises and government in order to improve their productivity and service delivery. It is also about creating an effective national innovation system with the necessary local R&D capacity to tap into global knowledge, creating and adapting new knowledge and disseminating it in such a way that it can be used by individuals and communities (BNRST, 2005). Within this context, it is also important to note that the method and degree of 'knowledge utilization' is shaped by a host of factors that are peculiar to leadership styles, institutional architecture and political culture of a country or policy domain (Stone, 2002)'. For research and efficient knowledge management to thrive, it is important policies be put in places that favor the creation of such an environment, which we aptly call an enabling environment.

4. Conclusions

This paper has looked at three countries in Southern Africa, Botswana, Zambia and Malawi, and their efforts toward commercialization of research and a culture of efficient knowledge management as a public good. It succinctly gives the insights of endeavors done by these countries in encouraging and coordination of research. The paper brings out lessons learnt on how research can or cannot contribute to national development, and further establishes the niche of research and effective knowledge management being a tool towards shaping a nation on the competitive edge in the global value chains. The paper emphasises that whilst a lot has been done in putting in place legal, institutional and regulatory frameworks and policies favouring the proliferation of research in these countries, a lot more has to be done. Specifically, the countries surveyed should come up with strategic initiatives to follow-up on some policies that have been put in place to encourage research. This will give a more accurate picture of what impact certain policies in place are making for achieving the desired purpose. Specifically, for a country like Botswana which has a dedicated commitment towards setting itself as a knowledge economy, some of the research initiatives are slowly transcending into contribution to national development i.e. GDP. Thus, it is appropriate to state that research is such an important tool for national development because it makes sense in all social economic setups.

It is worth noting that the three countries survey in this paper may not be representative enough to arrive at a conclusive stance of how Africa has put in place proper policies and regulatory frameworks to allow an enabling environment for the development of research. It is thus desired that a wider scan be done in future to ascertain the exact initiatives that have been done towards putting in place sound policies for encouraging research and knowledge management. It is desired that a broader-based literature review and case studies be done in order to ascertain the real status of incorporation of research into the development agenda of African countries. This broader-based scan will unearth the truth about how appropriate policies may aid the development of a research culture in Africa.

In this regard, any future endeavors to improve the role of sound policies in the development of research in Africa should be streamlined according to the following principles:

➢ Putting appropriate ICT infrastructure to promote exchange of ideas and reduce the cost of information management and dissemination.

➢ There should be established follow-up mechanisms to the research policies so that it is ascertained that the policy serve for the desired purposes.

➢ There should be put in place legal, institutional and regulatory frameworks.

➢ Educational campaigns should be made on a wider scale to make sure that everyone understands and buys in to the importance of research in any socio-economic setups.

➢ The private sector should be actively involved in setting up the national ICT backbone infrastructure as the government investments and subsidies alone cannot be enough to sustain this development.

5.   References

BNRST (2005). Botswana national research, science and technology plan, final report. Retrieved July 3rd, 2009 from www.ub.bw/.../2005_Botswana%20National%20Research,%20Science%20and%20Technolgoy%20Plan.pdf

Chilora, H.G. (2000). School language policy, research and practice in Malawi. Paper presented at the Comparative and International Education Society (CIES) Conference. Retrieved July 22nd, 2009 from www.ieq.org/pdf/Malawi_CIESpaper.pdf

Crewe, E. & Young, J. (2002). Bridging research and policy: context, evidence and links. Working paper 173. Overseas Development Institute (ODI)

Elliott, H. & Perrault, P.T. (2002). Zambia: A quiet crisis in African research and development. Retrieved June 22nd, 2009 from www.ifpri.org/pubs/books/oc51/oc51ch09.pdf

Graham, M. (2004). A strategic evaluation of the influence of research on public policy. Retrieved June 13th, 2009 from http://www.idrc.ca/uploads/user-S/10886094491Methodology_en1.pdf

HRPSA (2001). Health research policy of South Africa. Retrieved July 15th, 2009 from www.doh.gov.za/docs/policy/healthresearch-2001.pdf

MPRAP (2008). Malawi Macroeconomic Policy Research and Analysis Project. Retrieved July 22nd, 2009 from www.acbf-pact.org/programs/profiles/opdiv/MPRAP_May08.doc

Mazonde, I.N. (1998). Botswana's changing position in a changing world: towards the formulation of a cultural policy. Pula: Botswana Journal of African Studies, Vol.12, Nos.1 & 2.

MICT (2003). Malawi ICT Policy. Retrieved July 27th, 2009 from http://www.sdnp.org.mw/ict/malawi.ict.policy.pdf

Moahi, K.H. (2007). Library and information science research in Botswana: an analysis of trends and patterns. World Library and Information Congress: 73rd IFLA General Conference and Council, Durbam, South Africa

Mchombu, K.J. (2002). Which way information sciences research in Africa? Progress in LIS in Southern Africa. Proceedings of the 2nd biennial DISANNET Conference; pp. 1-10.

Newman, B. (1991). An open discussion of knowledge management; http://www.km-forum.org/what_is.htm

Ngubane, B.S. (2002). Cape Town declaration on research for sustainable development. ACP ministerial forum on research for sustainable development. Retrieved July 23, 2009 from http://knowledge.cta.int/.../ACP_2002_EC_ACP_Cape_Town_Declaration.pdf

OECD (1997). The OECD report on Regulatory Reform: synthesis. Organisation for Economic Co-operation and Development (OECD), Paris. Retrieved July 10th, 2009 from www.oecd.org/dataoecd/17/25/2391768.pdf

RCARENI (2005). Report of the conference on African research and education network infrastructure. Convened by the African Association of Universities (AAU) in Tunis. Retrieved June 27th, 2009 from www.aau.org/tunis/presentation/proceedings.pdf

Shankland, A. (2000). Analysing policy for sustainable livelihoods. Research Report 49, Brighton, Sussex: Institute of Development Studies.

Smith, J. A. (1991). The Idea Brokers: Think tanks and the rise of the new policy elites, The Free Press, New York.

Stone, D. (2002). Getting research into policy. University of Warwick, Retrieved June 10th, 2009 from http://www.dla.gov.za/documents&publications/publications/sis%20strategy/33/Associated%20background%20documents%5CChapt

UNECE Report. (2002). Towards a Knowledge-Based Economy: ARMENIA – country readiness assessment report. Retrieved May 30th, 2009 from www.unece.org/operact/enterp/documents/coverpagarmenia.pdf

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About the Author:

Bwalya Kelvin Joseph is currently a lecturer and Researcher at the University of Botswana. He holds a Bachelors of Science and Technology in Electrical Engineering (Moscow Power Engineering Tech. University) and a Masters in Computer Science (Korea Advanced Institute of Science and Technology). He is also currently pursuing PhD in Information Systems (Univ. of Johannesburg). He started his carrier in 2003 as a Research Assistant at Samsung's Image and Video Systems lab in Daejon, South Korea. In 2005, he was Researcher in the same lab. During this time, he wrote and presented several research papers at international fora. In 2007, he joined the University of Zambia where he worked for a year as a lecturer – Information Systems. He is also currently, Team Leader at the Tertiary Education Council of Botswana; Email: Kelvin.Bwalya@mopipi.ub.bw

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