

Applying knowledge management strategies to economic development in sub-Saharan Africa

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Sustainability looks to achieve best outcomes for human and natural environments both now and in the indefinite future. It relates to the continuity of economic, social, institutional and environmental aspects of human society, as well as the non-human environment. This paper examines economic development as one aspect of sustainability, with a focus on knowledge management as an economic development strategy. Using Grey's categories of knowledge management, the authors address sustainable economic development in the context of sub-Saharan Africa. Production capability is no longer completely dependent on capital and equipment; information and knowledge assets are increasingly important. In this information economy, success comes from harnessing the information and knowledge of a community. Such "indigenous knowledge," local and often tacit, exists in every community, every region and every country. This knowledge is useful in identifying new entrepreneurial opportunities, as well as for sustaining and advancing local businesses. Sub-Saharan Africa provides an excellent case study. No other region of the world is in more dire need of development. The 700 million people in this area face tremendous challenges, including the world's highest incidence of HIV/AIDS, deep poverty, unemployment, political instability, and a host of related problems. Key factors for using knowledge management as an economic development strategy in the region will include ICT (Information and Communication Technologies) literacy; uncovering and developing local intellectual assets; capturing tacit knowledge; internal and external knowledge sharing; and managing political, social and technological barriers. Other specific recommendations include promoting ICT literacy through training programs; leveraging internet and email technologies for community building; investing financial resources in R & D; and developing metrics for outcome assessment.

Keywords: Knowledge management, economic development, sub-Saharan Africa.

Introduction

Unless developing countries improve their productivity and shift to the production of goods – both of which involve acquiring new knowledge – they will face declining standards of living relative to the rest of the world. This is even more true within the context of the current global economic downturn (Stiglitz, 2011). These nations must move up the value-added chain to produce goods that typically require and embody higher levels of technology. To do this they must not just close the knowledge gap; they must also create knowledge and increase their capacity for using it (Friedman, 2005).

Economic development is furthermore one aspect of sustainability and is necessary for the creation of economic wealth for all citizens within the diverse and complex layers of society. The focus of this paper is to examine economic development as one aspect of sustainability, with a focus on knowledge management as an economic development strategy. Using Grey's categories of knowledge management, the authors address sustainable economic development in the context of sub-Saharan Africa. Economic development and sustainability issues in sub-Saharan Africa will be discussed in the first section of the paper. The second section will be framed in terms of the four areas outlined below, which have been harnessed from Grey's knowledge management compendium. The third part of the paper includes a general discussion of what knowledge is needed in the sub-Saharan Africa region and how it might best be managed. The final section of the paper contains a summary and conclusion that contextualize this discussion and provide recommendations for knowledge management practices in sub-Saharan Africa

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Knowledge management practices offer guidance to establish practical application strategies. An overview of these practices can be found in Denham Grey's compendium of knowledge management methods, tools, and resources (Grey, 1999). In this paper we highlight four areas from the compendium:

1. Knowledge Discovery: Mining transactional and sensing data for useful patterns.
2. Knowledge Sharing: Assisting with building shared meaning; improving understanding and increasing learning; emphasizing feedback and social negotiation; affording greater and faster information access; and supporting storage, search and publication.
3. Knowledge Innovation: Cultivating, nourishing and protecting the wellspring of information; building community, collaboration and trust to increase idea exchange and learning; improving access to new and improved data sources; advancing ways to store, search, display and distribute information.
4. Knowledge Structuring: Providing a framework to access and navigate knowledge stores, capture experiences (best practices & lessons learned) and facilitate learning; collaborative co-design; looking at relationships and reward structures to support information use; choosing the most effective process and representation for effective storage, search, and retrieval of information.

This paper will address how to adapt Grey's practices for the benefit of economic development in sub-Saharan Africa. The overarching presumptions are 1) that the creation and discovery of "relevant" knowledge fosters economic development and 2) that effective knowledge management is the mechanism by which to gain a competitive economic advantage. Along with these assumptions, knowledge management applications come with several challenges:

- Understand that knowledge is not an abstract concept, but rather actionable information with a demonstrated worth.
- Recognize that building an arsenal of knowledge without devising mechanisms for its effective flow and sharing is an act in futility.
- Comprehend that knowledge is not knowledge if it is absent of human thought and reflection.
- Understand that a substantial aim of knowledge management is to create a negotiated shared context between users of knowledge.
- Acknowledge that different types of knowledge require different management strategies.
- Understand that metrics for outcome assessment should be part of the overall knowledge management strategy.

Sustainable economic development

Sustainable development is not a new concept, but one with many applications and issues. Agriculture practices apply the sustainability concept to land and forest management (Sturtevant *et al.*, 2007; Ochola and Kerkides, 2004) and environmental activities (Janssen *et al.*, 2009). Policy makers use sustainable development to guide their planning frameworks for education (Wheeler, Burn, & Deri, 2003), information technology progress (Ahmed, 2009; Badamas, 2009), economic growth (Mohand-Said 2009; Ramaswami, Zimmerman, & Mihelcic, 2007), and rural development (Bruckmeier & Tovey, 2008). In the last few years, sustainable development has received renewed attention due to the growing awareness of global warming, as well as of the negative impact of development on both humans and the environment (Edwards, 2005; Friedman, 2009).

Furthermore, sustainable development is an ambiguous notion defined from many angles and viewpoints. The most basic, and one can add 'idealistic,' description is that of the ability to co-exist with another system indefinitely, without damage to either system. It is doubtful, however, whether nature and culture are sustainable forever, as the theoretical description of sustainability suggests. Based on our human history, cultures do not prevail indefinitely. In defining sustainability, we opt therefore to define the term rather as a process of moving towards sustainability, or of becoming more sustainable. This implies a long term commitment by all main stake holders not only to make resources necessary for sustainable growth available, but also to commit morally to what we produce and how we consume. In the context of sub-Saharan Africa, the sustainable development issue includes not only economics, but also values, value judgments and accountability for the human race and nature (Gustafson, 1995). Poor sustainability is most likely to happen in those societies in which there is no moral accountability for the agendas for development and economic growth (Sen, 1993).

Global sustainable economic development issues

If we then talk about sustainable development in Africa we need to start with a much larger issue, namely: Is there still room for more economic growth in this world? Asia, which represents more than two-thirds of the world's population, is experiencing massive economic growth. From an environmental perspective it can indeed be stated that the future of the earth is at stake if such growth is not managed well. Sachs (2005) makes the point that many poor nations, in particular

sub-Saharan Africa, work towards accelerated wealth creation, while the rich nations are still fully committed to their own growth agendas.

The aspirations of the poor nations in sub-Saharan Africa, as well as the possible consequences that this will have on the global eco-system, certainly cannot be ignored. It is our prediction that economic growth in Africa will continue on its current track and that the living conditions in Africa will improve. The challenge will be how to manage the sustainability of this growth and how to develop economic strategies that can accommodate for both growth and sustainability. Most economic strategies dealing with sustainable development are in agreement that the mere increase in the production of goods and in the export of raw materials is simply not a viable option for sustainable economic growth (Stiglitz, 2003). Technology is also not the panacea. Although modern ICTs (Information and Communication Technologies) are powerful tools for communicating information, they cannot solve the underlying socio-economic and political problems associated with development processes (Servaes, 2008: 206).

Bossel (1999) and Servaes (2008) have correctly demonstrated that, due to the complex nature of human societies, there is no universal 'one size fits all' developmental model for successful sustainability. Although sustainable development is relative in nature, it shares one key indicator: human capacity building. There can be no sustainable development without human development and economic growth built on a critical mass of knowledge workers with entrepreneurial and managerial capabilities (Servaes, 2008: 142). The reality is that Africa, as part of the global knowledge economy, operates in a totally new and fundamentally different global environment. In this setting, knowledge has become the key economic commodity within which development and sustainable growth occur (Friedman, 2005). Knowledge has become the critical success factor for sustainable development, and a well-developed, maintained and affordable information infrastructure supported by an investment in human capital has become the core ingredient of sustainable development.

We are therefore of the opinion that economic strategies for sustainable development in Africa should start with a massive investment in its own people – in other words, human capacity building. If Africa does not succeed in building human capacity or developing a strong and competitive knowledge sector, it will become even more marginalized and irrelevant in the global knowledge economy. This marginalization will grow further disconnected from the global knowledge networks. Africa's wealth creation will be limited to the export of its raw materials. The continent needs to make a substantial investment in research and development (R&D) activities. As Sachs illustrates, more interdisciplinary science and more universities are needed to address the challenges associated with sustainable economic development in Africa (2005: 13).

Furthermore, such a sustainable knowledge economy presupposes successful knowledge management principles. Clark argues that Africa must "...recognize and incorporate the new reality and focus on achieving knowledge-intensive development." (2003: 1). Knowledge-intensive development includes those practices related to the discovery and sharing of knowledge, as well as the ability to create new knowledge and to structure and disseminate it in an effective manner.

Challenges to sustainable development for sub-Saharan businesses

Successful investment in human capacity building in Africa and the achievement of knowledge intensive development, based on the principles of knowledge management, are seriously affected by a number of challenges. One challenge is the low level of literacy on the continent, particularly among the adult population. According to a report published in 2006 by the OECD, more than 60% of all adults living in Africa are illiterate. Another challenge is education, which is fundamental to human capacity building. Although more than 90% of primary school children attend schools in Africa, many of them end up working on farms, mainly due to a lack of opportunity to attend university or to find a job in the knowledge sector (African Economic Outlook, 2006). It is also important to note that although many African countries do allocate a substantial percentage of their GDP to education⁴, the dollar amount is still significantly lower than those in the developed world. In 2005 more than 40 million children have never attended school in Africa and there was a shortage of 3 million teachers; however the continent has made progress in primary education in recent years and can still be regarded as knowledge poor (Commission for Africa Report, 2005; OECD, 2009; Mason, 2011). This investment will prepare the next generation in Africa to become not only users of knowledge, but also effective knowledge creators who will foster sustainable economic growth and development (Economist, 2011).

This educational issue leads us inevitably to the next challenge: What is the current status of R&D and of knowledge production in Africa? Who are the knowledge creators on the continent, and to what extent can Africa address and solve its own developmental problems by means of locally generated knowledge? On the one hand, Africa has some excellent R&D facilities – for example, the South African Council for Scientific and Industrial Research, the African Economics

4. [In 2007 South Africa allocated 5,7% of its GDP towards education, Lesotho 10%, Namibia 7,9% and Kenya 6,2%. (Economist, 2007 Pocket World in Figures)]

Research Consortium, the Bio Sciences Facility for Central and Eastern Africa, and the Community and Individual Development Association (CIDA) City Campus in South Africa (Commission for Africa Report 2005, 138). There are however some serious concerns. In 2004/5 the spending on R&D was less than 0.1% of the continent's GDP, about 60% of all R&D activities are centred in South Africa, and in the greater Congo Basin there is virtually "no science at all." (Commission for Africa Report, 2005: 138). In the Executive Summary of the African Innovation Outlook 2010, it is furthermore reported that only 3 countries on the African continent currently spend more than 1% of their GDP on R & D activities. These are Malawi, Uganda and South Africa.

Nonetheless, it is encouraging that African leaders are not only aware of these knowledge production concerns; they also clearly understand the need for an indigenous base for science and technology that can foster sustainable development on the continent.

There are two significant sustainable development initiatives to mention in this regard. The first initiative is the commitment by the African Union (AU) to increase its spending on R&D to about 1% of the continent's GDP. This will compare more favourably with the European Union's 1.93% spending, and the 2% R&D spending of Japan and the USA (Science and Development Network, 2003; IISD report, 2007). The second initiative is the establishment of the African Ministerial Council on Science and Technology (AMCOST) in November 2003. This has been done under the auspices of the New Partnership for Africa's Development (NEPAD) and of the AU. The main purpose of AMCOST is to support sustainable economic growth on the continent by providing political support and leadership for the implementation of Africa's Science and Technology Consolidated Plan of Action (CPA). The CPA '...articulates Africa's common objectives and commitment to collective actions to develop and use science and technology for the socio-economic transformation of the continent and its integration into the world economy.' (AfDevInfo, 2007). It is clear that with these initiatives, Africa is actively trying to find answers for Africa from Africa. The question is where to find African researchers and financial resources to serve this mission.

This leads us to the next challenge: the brain drain from Africa. Many of Africa's well educated people are permanently leaving the continent at an alarming rate. According to the World Bank (2002), the monetary value of people leaving Africa now exceeds the total value of development aid that Africa receives. The World Market Research Center (2002) further estimates that it costs Africa more than \$4 billion annually to replace these losses in human skills. African countries have introduced a number of initiatives aimed to allow those countries to benefit from their citizens in diaspora. These are the Intellectual Diaspora Networks (Meyer, Kaplan & Charum, 2001), the Transfer of Knowledge through Expatriate Networks (TOTKEN Program, 2006) and the South African Network of Skills Abroad (S.A. National Research Foundation, 2002). The goal of these initiatives is to maximize the use of the knowledge and expertise of expatriates in such a way that contributes to Africa's development.

For Africa to successfully apply knowledge management practices in support of sustainable economic development, the continent will first need to successfully address the aforementioned issues: literacy, education funding, R&D, and the brain drain from Africa (Mulder, 2008; Mason, 2011). In the next sections, we define knowledge management, discuss these knowledge management strategies, and provide examples as to how their application can benefit sustainable development in Africa.

Knowledge and knowledge management

Knowledge can be the most valuable resource in any society. It empowers us to think, evaluate, analyze and act. Without knowledge development, the potential for progress is greatly limited. People must therefore be innovative in creating and sharing knowledge with one another, through knowledge management practices that recognize the value of knowledge in various forms. Knowledge is also key to economic development and sustainability (Rooney *et al.*, 2008).

What is knowledge management? Although it is a fairly new concept, it is an age-old practice. People have always shared knowledge with one another and applied it in an economic context. With the development and the introduction of the knowledge economy, knowledge management has become an important scientific concept in organization and management theory, and many disciplines have laid some claims to it. For instance, the re-discovery of knowledge as a means for gaining a competitive economic advantage in business has been evident mostly in commerce and industry.

The knowledge management trend has developed into a discipline with many applications, including the areas of sustainability and economic development. As such, it is considered in terms of both a business practice and a theoretical field of study (McInerney, 2000: 1009). Both the theory and the practical applications are still in the development stage, with many different descriptions and working definitions of knowledge management (Dalkir, 2005). According to the authors, McInerney provides the best working definition of knowledge management:

“Knowledge management is an effort to increase useful knowledge within the organization. Ways to do this include encouraging communication, offer[ing] opportunities to learn, and promoting the sharing of appropriate knowledge artifacts” (2000: 1014)

Based on this working definition, it is possible to demarcate the following main variables within knowledge management discourse and analysis:

- The use of knowledge within a business environment
- The application of knowledge to gain economic advantages
- The importance of creating and sharing knowledge to increase organizational effectiveness and efficiency.

Defining knowledge

In order to apply knowledge management, it is furthermore important to understand the notion of knowledge. McInerney (2000: 1009) defines it as “... the awareness of what one know[s] through study, reasoning, experience or association or through various other types of learning”. Since knowledge is bound to human nature, it is active, subject to change, and dynamic. Prusak and Davenport (1998: 2-20) describe this active nature of knowledge as a person’s experience, truth, judgment and rule of thumb. As such, knowledge is used to make decisions, overcome obstacles, and solve problems. From an organizational perspective O’Dell and Hubert (2011) argues that knowledge management is a systematic effort to enable information and knowledge to flow more effectively and to add value in decision making thereby helping organizations to achieve their goals.

According to McInerney’s definition, knowledge is not a static concept. It embodies a constant process of learning and acquiring new knowledge that is internalized and applied. If knowledge is not dynamic, it cannot be transferred or shared, a condition which would inhibit the creation of new knowledge. Effective knowledge management therefore presupposes knowers (McInerney, 2000: 1010) who must have the ability and capability to internalize what they learn. This internalization is mainly accomplished through listening, observing, reading and gaining life experiences.

The philosopher Michael Polanyi popularized another important distinction between tacit and explicit knowledge concepts (1968), and indigenous knowledge. He differentiates between tacit knowledge, which is unspoken, hidden, and un-documented, and explicit knowledge, which is documented or shared tacit knowledge. If tacit knowledge is not made explicit, it might be of less value and can result in lost opportunities. At times, the term competitive intelligence refers to this change of tacit knowledge to implicit knowledge. Competitive intelligence is intuitive knowledge that is captured and shared within a specific organization or culture. It is also the type of “indigenous knowledge” (IK) critical for economic development. The World Bank (2002) describes IK as being local in that it is rooted in a particular community and situated within broader cultural traditions. It is also tacit and therefore un-codified, and it is transmitted orally. IK tends to be used to explore and experiment by local people and has no theoretical underpinnings. It is constantly changing, being produced, discovered as well as lost; though it is often perceived by external observers as being somewhat static. However, IK is unique to every culture and is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in communities. IK provides problem-solving strategies for communities and is embedded in community practices, institutions, relationships and rituals. In the African context, IK can play a vital role in knowledge management.

In addition to the use of tacit and explicit knowledge, another important distinction is between ‘organizational knowledge’ and ‘individual knowledge.’ Individual knowledge is held by an individual, while organizational knowledge pertains to the body of collective knowledge held by an organization. Collective knowledge is shared amongst an organization’s members (Baumard, 2001), mainly via so-called communities of practice” (Dalkir and Liebowitz, 2011; Nonaka, 2002). Successful sharing is based on certain levels of trust amongst these members.

Although knowledge management is important in all societies, the creation and sharing of knowledge is especially imperative for developing communities and countries. If there is not an efficient transfer and use of knowledge among people in developing countries, they will not be empowered and the knowledge gap between the ‘knows’ and the ‘know-nots’ will only widen. There is no choice: developing communities will have to change and adapt to the new challenges of the knowledge economy, specifically the use of information and communication technologies. These communities will have to learn to become knowledge communities that create knowledge and share it effectively, for such knowledge is pivotal to these societies’ own survival and development. An awareness of the value of knowledge in its various forms has evolved into the discourse of knowledge management, outlined above.

Challenges to small business development in Africa

There is no doubt that technology and communications today form a corner-stone in knowledge management. In order for small businesses in Africa to succeed in implementing sound development plans based on knowledge management concepts such as followed by the Southern Eastern Cooperative Initiative, recognizes that knowledge assets, business

technologies and telecommunications are central to effective development. The following section outlines the infrastructure for information and communication technologies (ICT) and addresses specific knowledge management challenges for African small businesses.

Many new information and communication technologies, such as the mobile telephone and e-mail via the Internet, have been introduced in Africa. Much of the literature evaluating telecommunications infrastructure in Africa reports that many governmental projects and privatized projects extend telecommunications in the main cities and in rural areas. These ICT technologies provide the infrastructure for small businesses in Africa to share their knowledge more effectively than ever. This knowledge sharing is accomplished through discussion groups, mailing groups, interactive websites and live chats. As Nath (2000: 3) states: "...ICT breaks all the natural, social, cultural and hierarchical barriers to knowledge-sharing in an unprecedented manner". In addition to providing a vehicle for social and cultural change, another related aspect of ICT for African businesses is that most of the information communicated via the Internet is freely available for those with ICT access. This openly available information can give small businesses access to foreign markets, such as Asia.

Information and communication technologies are indeed tools for catalyzing economic change. Although they bring with them new opportunities, they also present new challenges. These challenges are two-fold. One challenge relates to the accessibility and use of information and communication technologies. Another challenge relates to the understanding the value of knowledge as it relates to establishing best practices and codifying that which is known. It is for this reason that Powell and Snellman (2004) argues that businesses need to realize the importance of the role of knowledge. It will not only enhance business operations but will also provide a competitive edge in the global marketplace. African businesses should for example consider appointing Chief Knowledge Managers, invest heavily in the development of an effective technology infrastructure and develop new measures of corporate performance based on knowledge

ICT implementation and literacy

These communication tools are to a certain extent available in Africa but businesses require more tools and training to effectively use it. Africa needs a greater penetration of information and communication technologies in specific small businesses. This is seen as an imperative for these businesses to become competitive in the market. However, the importance of such technologies is currently not very well understood by many local business people in Africa, and by implication is underused by local businesses in Africa. Robin and Webster argue that people must learn how to utilize information and communication technologies (1999). Currently, local business people in Africa lack the strong information literacy skills needed for using information and communication technologies effectively (Mason, 2011; OECD, 2009).

Information and communication technologies indeed contribute in many respects to improving knowledge sharing, but knowledge is still intimately human. The dynamic nature of knowledge still means that humans and their direct intervention is a prerequisite for successfully implementing knowledge management. Although information and communication technologies do create better possibilities for sharing knowledge, local businesses in Africa must also bear in mind that the implementation and use of information and communication technologies alone will not guarantee success. It is still the innovative creation and effective knowledge sharing that counts.

Businesses as learning organizations

For knowledge management to be applied effectively in small businesses in Africa, it is imperative for these businesses to become learning organizations (Skryme and Amidon, 2002). There must be a continuous process of knowledge creation and sharing which ensures that these businesses stay innovative and healthy. This requires a commitment to creating opportunities for knowledge sharing, as well as a commitment to fostering a culture of open communication. People must learn to become learners and work together. Learning organizations must furthermore be able to adapt to change and be resilient enough to weather socio-political and economic uncertainties. Without such a commitment to adaptation and learning, knowledge management cannot be successfully implemented.

It is against this knowledge management background that the authors of this article address the following question: How can small businesses in Africa become 'knowledge businesses' that understand the value and sharing of knowledge to gain a competitive advantage in their market? Two observations underlie this question: 1) Most small African businesses possess a wealth of local and indigenous knowledge, but that this is not effectively used in the market place. 2) Information and communication technologies, although introduced in Africa, are not nearly used to their full capacity to enable the effective sharing of knowledge. As Nath (2000) characterizes Africa: "Billions of people still live[] in poverty[,] as the tools of catalyzing social and economic change [information and communication technologies] lie unused and little understood."

Conclusion

As the continent moves forward with development initiatives to compete in the global marketplace, sustainable economic development presents strategies and challenges that must be addressed. Given that there is no universal model for sustainability, Africa's sustainable development strategies require human capacity building through research and development activities. Challenges for human capacity building in Africa include: a low investment in education, low literacy rates, underdeveloped research and development activities, and a brain drain from Africa. The growing discipline of knowledge management, which McInerney defines as increasing useful knowledge within an organization, provides strategies to address these challenges and encourage sustainable economic development in Africa.

Knowledge management as a set of practices offer a framework for small businesses in Africa to develop competitive development strategies. One application of knowledge management in Africa is to capture and share indigenous knowledge. That is, small businesses can capture and share knowledge that is local to the community, tacit, and oral. Grey's four categories for knowledge management provide a framework for developing effective practices in an African context. The initial phase of knowledge discovery mines data for useful patterns, such as indigenous knowledge. The knowledge sharing phase builds shared meaning through learning activities, including publishing and increasing access to publications. The next phase, knowledge innovation, builds community and collaboration and further increases access to information sources. Finally, the knowledge structuring phase provides a formal framework to support information use and choose the most effective process for information search and retrieval activities.

Knowledge management will vary depending on the goals of individual small businesses. However, harnessing the information and communication technologies infrastructure in conjunction with knowledge management practices provide a roadmap for economic development. To improve the implementation of such strategies in sub-Saharan Africa, the authors provide the following suggestions:

1. Promote ICT literacy through training programs that teach people to locate and evaluate the quality of information, store and retrieve information, make effective use and ethical use of inform and apply information to create and communicate knowledge (UNESCO, 2008). For example, InfoLit, a South African initiative, helps to promote IL to key regional players and recommends one-time and continued user education programs (Lau *et al.*, 2007).
2. Utilize Internet and e-mail technologies to foster community and communication via discussion groups, mailing lists, interactive websites and live chats
3. Invest more financial resources in R & D activities, which would positively diversify Africa's wealth creation beyond the export of its raw materials
4. Develop metrics for outcome assessment of knowledge management practices Sample measurement tools include the British Standards Institution approach (BSI, 2003), Sveiby's Intangible Assets Monitor (2002), and the KM Reference Model (Botha and Fouché, 2002).

We conclude that Africa's most underused and untapped resource is indeed its wealth of knowledge the value of this paper is to address specific knowledge management needs in Africa for sustainable small business development. Implementing sustainable economic development practices will aid the continent in gaining a competitive advantage in the global marketplace and position small businesses to compete in the 21st-century knowledge economy.

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