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THE CHALLENGES OF KNOWLEDGE HARVESTING AND THE PROMOTION OF SUSTAINABLE DEVELOPMENT FOR THE ACHIEVEMENT OF THE MDGS IN AFRICA.

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This Occasional Paper examines the challenges of knowledge harvesting and the promotion of sustainable development for the achievement of the MDGs in Africa. The reflections and judgments contained in this paper are, however, those of the authors and do not necessarily reflect the official position of the African Capacity Building Foundation.

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THE AFRICAN CAPACITY BUILDING FOUNDATION

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ACBF's mission is to build sustainable human and institutional capacity for sustainable growth, poverty reduction and good governance on Africa. The Foundation intervenes in six core competency areas, namely, economic policy analysis and management, financial management and accountability, strengthening and monitoring of national statistics, public administration and management, strengthening of the policy analysis capacity of national parliaments, professionalization of the voices of the private sector and civil society.

Besides intervening directly in the area of capacity development, ACBF also provides a platform for consultation, dialogue, cooperation as well as information and knowledge sharing amongst development stakeholders and partners across the African continent.

The Foundation is present in some 44 sub-Saharan African countries and has committed more than US$350 million to interventions in capacity development since its inception.

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ABSTRACT

In the present global economy, knowledge production is taking place at a fast pace. Knowledge is also becoming obsolete rapidly. For Africa to compete globally, it is imperative that it not only has access to global knowledge, but more importantly, it needs to harvest and harness existing local knowledge systematically. While a wealth of information and knowledge exists on the continent thus shaping local development daily, such knowledge tends to be fragmented and often inaccessible to local development partners. Drawing on the ACBF's operational experience, this article argues that seeking ways to creatively make this knowledge readily accessible to key decision/policy-makers is central to managing innovation, promoting sustainable development and the achievement of the MDGs in Africa. The resultant creation of new knowledge will inspire new dialogue on the issues confronting Africa and drastically cut back on duplication of efforts - ensuring that both local actors and decision/policy-makers have access to the right knowledge at the right time for sustainable development. This will require that governments, communities and donors learn from one another and share innovative practices and lessons in the art of capacity development. It also requires actors in development to pay attention to creating spaces and opportunities whereby ideas can be generated and shared and where knowledge can be captured and utilized. ACBF's knowledge networks are one such tool via which knowledge generation, capture and targeted dissemination takes place with a goal of shaping policy and decision making across the Continent. ACBF has also implemented a number of projects in Africa on which new interventions could be modeled.

Key words: Africa, Capacity Development, Globalization, Innovation, Knowledge Harvesting, MDGs and Sustainable Development.

I. INTRODUCTION

In today's global economy, knowledge production and idea generation are critical to long-term competitiveness; yet this generation as well as decay is taking place rapidly. Harnessing knowledge is essential to the ability of organizations and countries to change, adapt and seize opportunities. Advocates of Knowledge Management (KM) posit that its potential is limitness and "vital for Africa." Proponents of Knowledge Management further argue that new world economy is one in which knowledge capital, intellectual capital, learning, intangible assets, and social capital form new types of socio-economic value (Malik and Malik, 2008). In essence, KM strategies can be utilized to: a) create new knowledge and knowledge assets; b) curb duplication of efforts and reinvention of the wheel; c) get the **right knowledge** to the **right people** at the **right time;** d) enhance and leverage indigenous knowledge assets; e) promote efficiency, effectiveness, creativity and empowerment; and f) boost intellectual capital, innovation and competitiveness. The challenge is for Africa to transcend its knowledge deficit and bridge the knowledge gap between Africa and other societies.

The development challenges confronting Africa are wide-ranging such as: reducing poverty and hunger, enhancing food and energy security, strengthening macroeconomic management in the face of the current recession, combating the negative effects of climate change and improving development prospects for future generations. Considerable progress in handling these challenges is required to achieve meaningful sustainable development. This means more efficient exploitation and utilization of knowledge to, for example, increase the annual rate of *per capita* food production to at least 4% and real economic growth rate to at least 6-7%, as well as to control environmental degradation, amongst others. By better knowing, harvesting, managing and using knowledge as a vital, effective and competitive development resource; Africa can launch itself on a sustainable development path. The absence of progress on the aforementioned fronts, on the other hand, spells under-development, mis-development, non-development or unsustainable development (Hamel, 2004).

The paper is divided into six parts of which this is the first. Part two discusses the notion of knowledge against information and the link with Knowledge Management (KM). It is argued that the distinctions among these three concepts are crucial for setting up an effective KM system. Part three explores the notion of knowledge harvesting as a crucial mechanism to ensure knowledge is leveraged for development and the achievement of the MDGs in Africa. Part four examines the nexus between knowledge, an impetus for Development and the attainment of MDGs – some of the impetus such as ability to respond to shocks and transformative leadership are heavily knowledge-based. Part five discusses a case study of how technology transfer and innovation as the process of knowledge generation and absorption has played a role in enhancing banana production in Kenya and Uganda. Part six discusses the roles ACBF can play in enhancing knowledge harvesting for development. Part seven concludes the paper.

[1] According to Hamel (2004), in the 1990s fourteen African countries saw a deterioration of their human development indexes: Botswana; Burundi; Cameroon; Central African Republic; Congo; Dem. Rep. of Congo; Côte d'Ivoire; Kenya; Lesotho; South Africa; Swaziland; Tanzania; Zambia; Zimbabwe. This very situation might not have changed considerably as most of the countries remain fragile. Indeed, about 30 countries in SSA are currently considered fragile by the Organization for Economic Cooperation and Development (OECD).

II. KNOWLEDGE, INFORMATION AND KNOWLEDGE MANAGEMENT

It has to be noted that knowledge is much broader and transcends data and information. In many instances, knowledge includes judgment and experience needed to take action (e.g. to design a project, serve a client). The concept of knowledge can be understood through its relationship to data and information. Parikh (2001) posits that data are merely raw facts collected from routine and daily social transactions and activities, and that data must be processed and structured into a meaningful, composite model to become information. Once information is created, one is therefore able to filter it through a relative model of understanding to become a body of knowledge. Thus, knowledge is created only as information, but is interpreted and evaluated from a contextual mental outlook. Senge (1994) argues that because individuals and societies have different mental outlooks, the knowledge acquired from the same compilation of information can differ greatly, not only in quality and interpretation but also in applicability. Knowledge Management therefore differs from information management because the former implies a persistent, intentional effort of extracting from available information what is critical for socio-economic success, while the latter is more concerned with making critical information available in a timely and consistent manner to end-users within the organizational/social structure. Information management is a critical input into knowledge management, but it is not enough. Knowledge Management entails the creative mining of information from diverse sources with the purpose of 'business' opportunities and continuity in mind. As society peruses its information assets through the multitude of perceptual filters available, high-impact, intangible assets are likely to be unearthed, and with the potential to substantially affect the way socio-economic arrangements are configured (Gupta and McDaniel, 2002).

Generally, two approaches to Knowledge Management are often articulated in the extant literature: a) *the knowledge-centered approach*, which emphasizes the collection and codification of explicit knowledge, and relies heavily on ICT; and, b) *the knower-centered approach,* which perceives knowledge as a human resource and recognizes that while explicit knowledge may be manageable, tacit/implicit knowledge can be shared through interaction. The two approaches can be perceived as two extremes of a continuum. In reality, however, most KM strategies are a blend of both. Distinctions amongst the three key typologies of knowledge – tacit, implicit and explicit are critical to understanding the working mechanisms of knowledge management.

- ***Explicit:***
  Information and skills that are easily communicated, documented, and conveyed to others. It is the knowledge that is collected, stored, distributed and shared primarily as electronic or paper documents.

  Africa has a long way to go to bridge this gap in knowledge as very little of existing knowledge has been codified in ways that can be easily accessed by others. The traditional systems of knowledge codification and transfer, primarily through oral sharing and cultural practices, have not kept up pace with the urbanization and increased mobility of African societies. At the same time, while the continent has made progress in the area of using modern communication techniques such as the Internet and computers, it has lagged behind other regions. One significant exception is the use of the mobile phone that has been used to combine explicit and tacit knowledge in creative ways in Africa.

- ***Tacit:***
  Knowledge that is experiential and intuitive. It is the subjective and experience-based knowledge that cannot be easily expressed in words and sentences. It also includes cognitive skills such as beliefs, images, intuition and mental models as well as technical skills such as craft and know-how.

  Africa needs to ensure that ideas in practice get documented and shared. This would be very relevant for cases in agriculture and productivity, micro-adaptation as a result of shocks (price shocks) or even adaptation to climate variations in history and how that would serve in today's challenges of climate change. As a recent Report on the importance of biotechnology and innovation in Africa's development put it:

  > "[T]he role of science and technological innovation in economic change and sustainable development is increasingly recognised: we now know that many of the economic advances in developed and newly industrializing countries stem from innovation – this might be technological innovation, or innovation in organization, processes, and management. One of the keys to success from innovation has been a focus on improving skills in essence, putting a premium on learning. This strategy means that that every generation receives a legacy of knowledge that it can harness to its own advantage. Every generation blends the new and the old, and thereby charts its own path in development" (Juma and Serageldin, 2007: 10).

- ***Implicit:***
  Implicit knowledge is a subset of tacit knowledge that can be easily transformed into explicit knowledge. As such it represents knowledge that can be captured and codified if subjected to some type of mining or translation process. In this document tacit and implicit knowledge are used interchangeably.

Explicit knowledge is codified and stored in our "collective memory" and is available to everyone throughout the socio-economic structure. Conversely, tacit knowledge is personal knowledge possessed by an individual member of society that may be difficult to express or communicate to others. Because a population of employees possesses a theoretically infinite number of mental maps, or ways of perceiving information, tacit knowledge is often individualized and highly specific in scope. Lubit (2001) argues that tacit and implicit knowledge is often difficult to disseminate to others, but it is also invaluable to propagate because it is a unique asset that is very hard to copy by other organizations or society. Hence, given this premise, it can be logically understood that both implicit and tacit knowledge can form the basis for competitive advantage and social transformation, but to do so it must become manifest in the real world and utilized to actualize the strategic agendas society/country in question.

By implication, African economies better manage their intellectual capital base by uncovering the tacit knowledge of its people (be it in terms of traditional knowledge) and turning that into explicit knowledge and making it available to enhance sustainable development.

Stonehouse et al. (2001) note that the concept of knowledge management has evolved over the years from research on 'organizational' learning. It is simply the next phase-up of an evolutionary process of strategic frameworks that seek to explain how an organization or country may generate superior performance relative to the competitors in its market. Earlier approaches centered on the competitive position of an organization within its industry – such as oligopoly and monopoly

theories of the market. Subsequent attention was focused on the creative mastery of an organization's core competencies to achieve competitive advantage (Porter, 1990). Knowledge management requires a proper understanding of socio-economic and environmental context (Wenger, 2004). One needs to have processes in place to coordinate the management of knowledge and integrate it into business processes such as ICT, interpersonal connections, and document repositories, as well as institutional and cultural norms of paying attention to knowledge created. While all of these factors are important enablers, they do not foster Knowledge Management. It is paramount to involve practitioners actively in the process otherwise; one's ability to truly manage knowledge assets is going to remain seriously limited. Senge (1994) argues that the only construct within grasp of an organization/society, which will produce lasting, sustainable advantage, is the usable knowledge produced from purposeful, well-orchestrated learning by everyone within the firm/society to meet set targets. This collaborative effort towards openness to learning and new ideas would create a culture of excitement and creativity, forming the basis for the organization/society as a learning organism to strategically meet its development agenda.

Unfortunately, most research into Knowledge Management has been concerned with capturing the knowledge embedded inside of the heads of individuals within an organizational context (Nidumolu et al., 2001) at the expense of informal sources. This "within" approach is certainly a substantial place to begin even though it is less than holistic. The vast expanse of knowledge exists outside the traditional boundaries of the organization, yet the challenge of capturing functional knowledge in the midst of this overwhelming information availability remains elusive (Oder, 2001). Africa needs to develop structures and processes that create a balanced and complementary effort toward combining knowledge acquisition from inside and outside of the organization/society. Such an effort would give true meaning to KM as systematically & routinely creating, gathering, adapting, organizing, sharing; and utilising knowledge for sustainable development. Africa needs to get the right knowledge to the right people at the right time.

Wenger (2004) suggest four fundamental principles to undertake KM as a strategic activity:

- ***Use practitioners*** – these are the people who use knowledge in their activities, and they are in the best position to manage this knowledge. Practitioners need to interact with one another because they benefit from the stimulation and because knowledge of any field is too complex for any individual to cover.

- ***Community of Practicae (CoPs)*** – these are groups of people who share a passion for something that they know how to do, and who interact regularly in order to learn how to do it better. One could argue that communities of practice are the cornerstones of Knowledge Management. CoPs can be defined by disciplines, by problems, or by situations.

- ***Develop a framework for self-management of CoPs*** – practitioners have a special profession bonding with each other because they share actual experiences and business solutions. They understand each other's stories, difficulties, and insights. This allows them to learn from each other and build on each other's expertise. Whatever systems and structures you have in place, there is no substitute for practitioners who act as knowledge managers. CoPs must therefore self-manage their knowledge; and

- ***Help CoPs get connected to others as they do not know everything*** – practitioners can do all this with a bit of help in other areas outside of their expertise. CoPs need to be in dialogue with

everyone in the network, other communities of practice, and experts outside the network. In essence, no community can fully manage the learning of another, but no community can fully manage its own learning.

III. KNOWLEDGE HARNESSING AS A KNOWLEDGE MANAGEMENT ACTIVITY

Knowledge harvesting is not a catchall solution but an integral part of KM. It hinges on trust and is engendered by shared context. It cannot succeed in conflict environments, where potential knowledge contributors think they will jeopardize their status or security if they share their knowhow. However, in learning organizations, it can be leveraged judiciously to codify some human expertise in such ways that others can make use of it, for instance during staff induction or through learning and development programs, good practices, and how-to guides.

Numerous benefits can flow from enabling the sharing of knowledge stocks between entities: (i) the knowledge of individuals (but also groups) is made available to those who might need it independently of human memory – thereby, it bolstering institutional memory/capacity development; (ii) a wide range of solutions to organizational issues are produced; (iii) the ability to manage change is enhanced as knowledge is packaged for easy access & understanding; (iv) the likelihood of repeated mistakes is reduced; (v) the learning curve of new personnel is shortened; (vi) precious knowledge is not lost when personnel leave; (vii) the tangible knowledge assets of the organization can be increased to create organizational value; and (viii) knowledge is communicated as guidance and support information. Knowledge harvesting therefore, elicits, organizes, and deploys explicit, tacit/implicit knowledge as key knowledge assets.

Knowledge harvesting can be applied to any field of human activity. In organizations as well as society, opportunities lie in operations, products, services, strategies, and even management. In association with other techniques for knowledge capture and storage, as noted above, knowledge harvesting deliberately elicits, organizes, packages, and shares know-how. Several intra-organizational factors drive knowledge-harvesting design: the principal being (i) tacit knowledge enablers and inhibitors; (ii) the criticality of the knowledge to the organization; (iii) the need for immediate transfer; (iv) the complexity of the knowledge topic; (v) the qualities of knowledge contributors; (vi) the characteristics of knowledge seekers; (vii) the dispersion of knowledge contributors and knowledge seekers; (viii) the type of facilitation required; and (ix) the need for external review and validation (Serrat, 2010).

The avenue to exploit the know-how of others (be it internal/external to an organization) could arguably be based on the following: (i) the need to preserve critical know-how (internally) – this means putting in place effective and strategic Information Management System; (ii) the need to rethink theories-in-use and, old paradigms to allow for collective learning and adjustments; and (iii) the need to introduce new ideas and approaches to spur creativity and innovation.

Serrat (ibid.) highlights seven approaches to knowledge harvesting whereby, the intricacies and resource requirements will necessarily depend on the object and scale of the exercise:

- ***Focus*** **–** it is impossible to collect and transmit everything that individuals know. An organization/society should therefore determine what critical knowledge it wishes to connect

more intimately with, and be clear about the benefits from that. It is crucial to focus. For example, only individuals who are likely to contribute critical knowledge that can be profitably transferred can justify the investment of time and talent that knowledge harvesting requires. The organization can then harvest mindfully and strategically, with reuse and learning and development as the prime targets.

- ***Finding critical positions*** **–** the organization should locate where knowledge harvesting stands to generate most benefits, or where knowledge loss is the greatest threat, and identify and prioritize the specific know-how at risk. This is equivalent to identifying critical growth points and requisite resources to herald transformation.

- ***Eliciting correct feedbacks*** **–** this is to generate, obtain, or provoke a response or answer to a given set of strategic questions. This entails effectively guiding a person through the process of expressing what he or she feels or knows about a particular topic or theme, preferably using one-on-one, face-to-face interviews supported by video and audio recording amongst other extracting/recording mediums. Interviews can be structured, semi-structured, or (preferably) unstructured. They must be well prepared. The lists of questions or topic and thematic guides developed should be shared in advance, aiming to provoke reflection and draw out details (for example as the case is in the ACBF's Senior Policy-makers' Knowledge Sharing Program). Effective harvesting persuades participants to speak concretely, shun blame, temper judgment, and anchor assumptions in shared meaning.

- ***Organizing the knowledge*** **–** the knowledge elicited must be tested for sense, recurrent patterns, as well as gaps and inconsistencies, and then arranged in coherent and systematic forms for ease of access and clarity. By and large, the materials can be ordered and structured into logical groups comprising signals that provide context, guidance that enhances action, and support information that develops understanding and reflection.

- ***Packaging and dissemination*** **–** after a body of knowledge has been organized, insights must be packaged into deliverable knowledge assets and made available through media that are tightly integrated with the original purpose of knowledge harvesting. It is crucial to consider knowledge seekers and their needs while packaging and disseminating any information. For effect, this stage must include individuals from other functions and disciplines, including methodology keepers, learning and development specialists, and marketing experts. The miscellaneous outcomes may include manuals, checklists, guidelines, collections of reminiscences on topics and themes, films, stories, etc.

- ***Evaluation*** **–** based on feedback from knowledge seekers as contributors, and further enrichment from continual harvesting, the relevance, efficiency, effectiveness, sustainability, and impact of outreach should be monitored and evaluated. Organizations should also consider the value of know-how over time: knowledge that is codified in static documents can quickly date. An effective performance measurement framework becomes paramount with focus on results; and

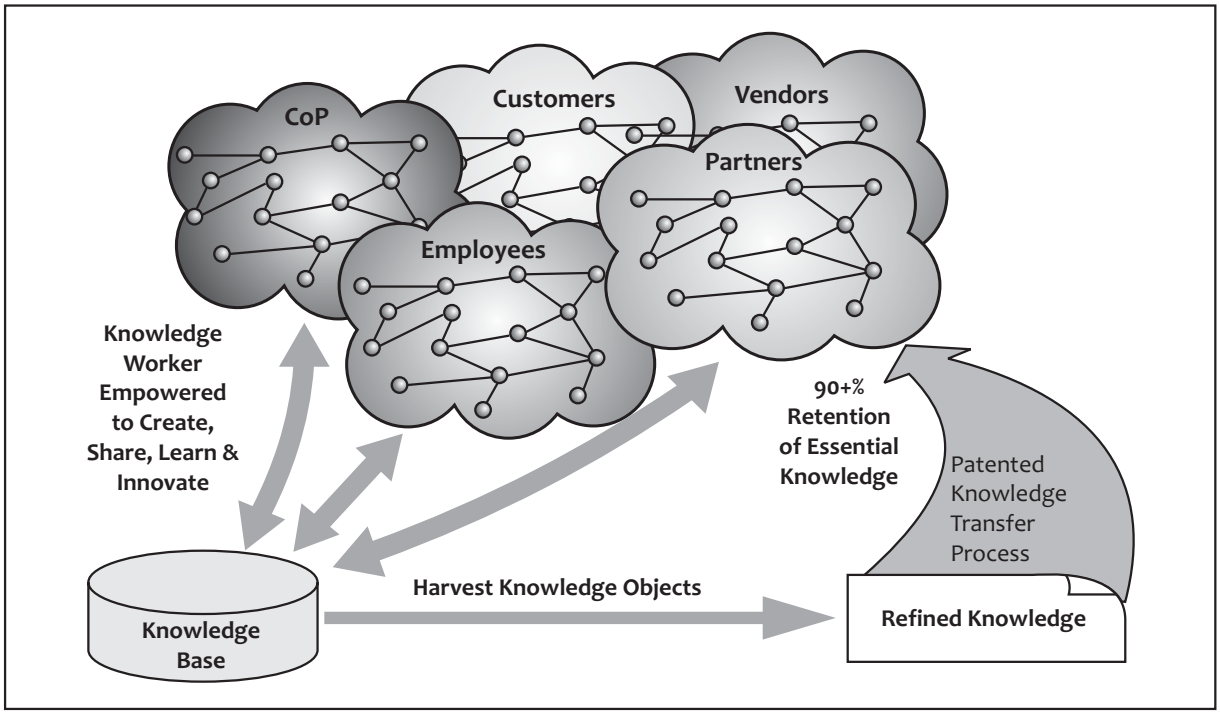
- ***Adapting the knowledge*** **–** some instances may require that one adapt a body of knowledge to fit, or change to suit, a new purpose. As knowledge assets are shared and applied, new requirements will inevitably emerge that require adaptation. Organizations must facilitate, empower, and document instances of learning so that critical knowledge assets incessantly evolve and get application in new contexts.

There are research findings that indicate that knowledge acquisition is positively correlated with knowledge exploitation for competitive advantage (Yli-Renko et al., 2001). Hence, the strategic knowledge harvesting activities have been empirically linked to tangible differentiation and advantages in the marketplace. With this as a base of understanding, organizations/society can move forward in a purposeful manner to capture knowledge with the potential for exploitation and utilization in ways that drive their developments. In practical terms, the reasonable socio-economic objective should be to identify knowledge relevant for current and predictable future needs (Parikh, 2001), rather than harvesting that, which solely supports the ideas of management in the mere fledgling stages. Knowledge should be gauged as a resource hard to imitate, difficult to co-opt, giving its possessor a unique commodity to have an edge in a global competitive economy.

Accordingly, one has to keep in mind that harnessing knowledge requires that: (i) a given KM strategy is understood by all and with management buy-in; (ii) one identifies and taps the knowledge resources available especially–staff know-how, information resources, technology and their links to stakeholders; (iii) there is development of a culture premised on continuous learning, openness, productive co-operation, knowledge sharing and diversity of 'knowers'; and (iv) there are appropriate knowledge capture, conversion and dissemination tools & techniques.

Figure 1 below presents a diagrammatic model for harnessing as discussed above. Central to the model, is the need to tap into the collective know how of myriad stakeholders – employees, partners, vendors, customers and CoP – such that a knowledge worker is empowered to create new knowledge, share, learn and innovate.

Figure 1: Model of harnessing knowledge



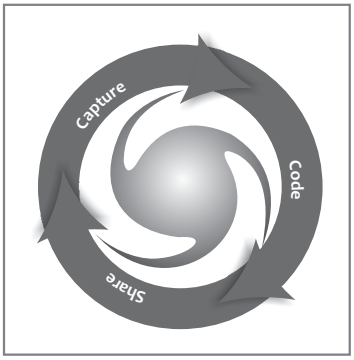
Source: http://www.geenius.com

There are a number of knowledge harnessing and conversion tools in practice: (i) Story Telling; (ii) After Action Reviews; (iii) Blogs; (iv) How-to Guides; (v) Exit Interviews; and (vi) Knowledge Harvesting. Often to achieve uptimum benefits KM practitioners suggest that an institution should

combine a number of such techniques in the knowledge harnessing efforts.

These conversion tools/techniques are diagnostically represented in the figure 2. The primary mechanism with all the above – mentioned tools is their ability to capture, codify and then share such knowledge to the target audience in an appropriate way.

Figure 2: Knowledge harvesting loop



The aforementioned notwithstanding, one also needs to draw attention to the potential threats to effective knowledge harvesting. In many organsations and societies, Africa being no exemption, the primary threat to harnessing knowledge is often not due to technology, capital constraints or illiteracy. Rather, the threat often hinges on internal social impediments to change. Efforts should therefore be adopted to address and transcend. Such internal challenges thereby enhancing the knowledge spiral

The figure 3 below highlights the chain of such a possibility. As with all activities that are premised on human interaction, harnessing knowledge can be impeded if an organisation does not have the appropriate culture systems and processes in place. Where such social impediments do occur, it is possible to witness a situation of knowledge collapse.

Figure 3: Threats to Harnessing Knowledge

Not technology, lack of capital, illiteracy or disease...Primary threat is internal to most organizations; namely, the existing social impediments to:

Creation of new knowledge

Diffusion of innovations

Recycling of new knowledge and

A culture focused on fending off threats (perceived or real), from inside or outside, rather than enabling local, social meachanisms of charge to flourish.

IV. KNOWLEDGE IMPETUS FOR DEVELOPMENT AND THE MDGs

The link between knowledge and socio-economic transformation is relatively well known. Harnessing and utilizing knowledge is therefore an important economic development activity (Jarboe, 2001; UNDP, 2001). Building social capital and a means for sharing that knowledge is another (Narayan, 1999). Economists such as Perroux (1955) and Hirschman (1958) argued that economic development strategies that foster development of economic clusters at its core to enhance dynamic economies of scale and growth. Social capital and information sharing play a crucial role in creating successful economic clusters or growth poles. Traditional explanations of industrial clusters were based on costs and physical resources such as the railroad and steel industry. The concept of information and knowledge as the key factor of production adds an extra dimension to the understanding of the process of economic clusters (Jarboe, op. cit). What makes for a successful cluster or growth pole in today's global and highly competitive environment is the implicit sharing of knowledge and skills, especially tacit knowledge. As Porter (1990) notes, "clusters represent critical masses of skill, information, relationships, and infrastructure in a given field." Clusters or growth poles are an efficient means of knowledge transfer and management.

With rapid globalization, it has become increasingly clear that one of the most crucial variables in economic development is the knowledge assets (intellectual capital) of a nation. It is not just the natural resources of the country that will determine the standard of living of a country and the achievement of the Millennium Development Goals (MDGs), but rather, the knowledge supply that exists in the country to better manage these resources. Japan is, perhaps, the outstanding example of this point in that it developed a strong industrial foundation without mining iron. Conversely, it is also possible to find some exceptions in countries rich with natural resources, such as oil, but with high levels of poverty – for example, Nigeria and Angola.

In general, it is a country's knowledge of technology, of science, and of management defined broadly that is going to determine its economic future (Cyert, 1991). A country's knowledge capital in these areas will drive innovations and it is through these innovations that significant increases in productivity will happen ala Schumpeter. Increases in productivity will in turn spur social transformation – especially employment and better infrastructure to determine the extent of the increase in the standard of living. Africa's ability to mobilize its knowledge in product design, in manufacturing techniques, and in management of its diverse resources to increase productivity will determine the pace economic development.

Prior to the recent developments in the world economy which have pushed Africa into precarious growth prospect to achieve the MDGs, Africa posted an average economic growth rate of 6 percent, controlled inflation down to double-digit levels, reduced budget deficits and even began building up notable reserves particularly for the commodity exporting countries. As a result, some African countries made significant headway toward achieving some of the millennium development goals (MDGs). For examples, the proportion of Africans living on less than $1.25 a day is estimated to have fallen from 58 percent in 1996 to about 50 percent in the first quarter of 2009. The prevalence of HIV/AIDS stabilized, primary school enrolment increased, and progress was being made in many other areas of human development (World Bank, 2010). These positive developments were a result of, amongst other factors, sound macroeconomic and structural reforms; an auspicious external environment as manifest in high international commodity prices, increased private capital and remittance inflows, enhanced aid inflows and international debt relief; and improvements in

governance and accountability (IMF, 2009). However, save for a handful success stories, this rate of progress was widely considered inadequate for the Continent to be on course to meeting the MDGs, centered on halving the incidence of extreme poverty and hunger by 2015. Africa still has the highest incidence of poverty among all developing regions, being home to 30 percent of the world's poor despite accounting for a mere 10 percent of the world's population. The region is the only one in the developing world to have regressed in terms of poverty in the 40 years leading up to 2005, leaving the incidence of extreme poverty at twice the global rate (World Bank, 2005).

The global recession has further weakened and worsened Africa's economic outlook, through occasioning steep reductions in commodity prices, tourism earnings, exports, remittances, and private capital flows. For example, remittance inflows to the region which reached about $20 billion a year before the financial crisis have fallen by 4 to 8 percent, hitting hard particularly such countries as Lesotho where remittances normally account for 29 percent of gross domestic product (GDP). Growth is forecasted at yet lower levels that in the past 4 years (Table 1).

Table 1: Real GDP growth (%)

	2005	2006	2007	2008	2009 (estimated)	2010 (projections)
Africa	5.9	5.9	6.0	4.9	1.3	4.3
Central Africa	5.0	2.6	5.6	4.5	0.9	3.8
East Africa	7.4	6.8	7.5	6.4	3.9	5.3
North Africa	6.0	5.9	5.3	4.7	3.5	4.1
Southern Africa	6.0	6.6	6.7	4.6	-1.6	4.1
West Africa	5.1	5.3	5.9	5.3	2.4	4.7
Oil -exporting countries	6.8	6.0	6.9	5.6	2.5	4.9
Oil -importing countries	4.9	5.9	5.1	4.2	0.5	3.6

Source: UNECA (2010). *Economic Report on Africa*. Addis Ababa: UNECA.

Equally, private capital flows fell by 40 percent in the second half of fiscal 2009, from an all-time high of $53 billion in 2007, helping to finance much-needed infrastructure and commodity-based investments. As a result, the average economic growth forecast for the region was lowered from a peak 6.1 percent in 2007 to 1.7 percent or below for 2009 (IMF, 2009, 2010). Lower growth and the food crisis are expected to further retard Africa's progress towards the achievement of the MDGs, even for countries like Ghana that were close to halving poverty by 2015 and other leading performers like Uganda, Tanzania, Mali, Burkina Faso, Rwanda and Mozambique (World Bank, 2010; Herfkens, 2009).

Controlling for the transitory effects of the ongoing global financial crisis and the recent food and fuel shocks of 2007-08, a trend analysis would underscore the centrality of capacity and Knowledge Management as key covariates of Africa's development trajectory over the last six decades, alongside slow and inequitable growth, and poor governance and systemic corruption. The international attention that is being paid to Africa's progress toward meeting the MDGs by 2015, recent international commitments to increase the quantity and quality of aid to developing countries, and improved resource inflows to the Continent in terms of debt relief, aid, remittances

and foreign direct investment (FDI) have refocused attention on Africa's inadequate capacity to absorb increased resource inflows as well as the harvesting of 'global' knowledge and turning them to positive development drivers and outcomes.

King'ori (2008) argues Africa needs to focus on five priority agenda to meet the MDGs – regional integration, managing urbanization, tackling unemployment, boosting agriculture and investing in ICT. First, regional integration should be designed to remove balkanization and enhance regional trade. Free movement of people and greater trade will foster greater development opportunities. Second, more and more people are anticipated to be living in urban areas by 2030. Many of these people are expected to be in Africa. The problem is that slums dominate many African cities without access to basic services. Africa countries need to develop an approach that allows for planned urbanization – including stepping up the provision of amenities in rural areas. Third, the continent needs to focus on creating gainful employment – especially for its youths. Without the continent tackling inequalities among its population, and more so among the young, there are likely to be greater chances of revolt and conflict. The youths should be given relevant learning opportunities and entrepreneurial skills. Fourth, agricultural production should be boosted and diversified to tackle not just commodity dependency but also food insecurity. Knowledge Management could be deployed to enhance market access and information dissemination on 'agricultural' science to increase productivity. Finally, Africa needs to enhance its ICT connectivity that can transform the way the continent does business and allow for more Knowledge Management–based solutions to Africa business models.

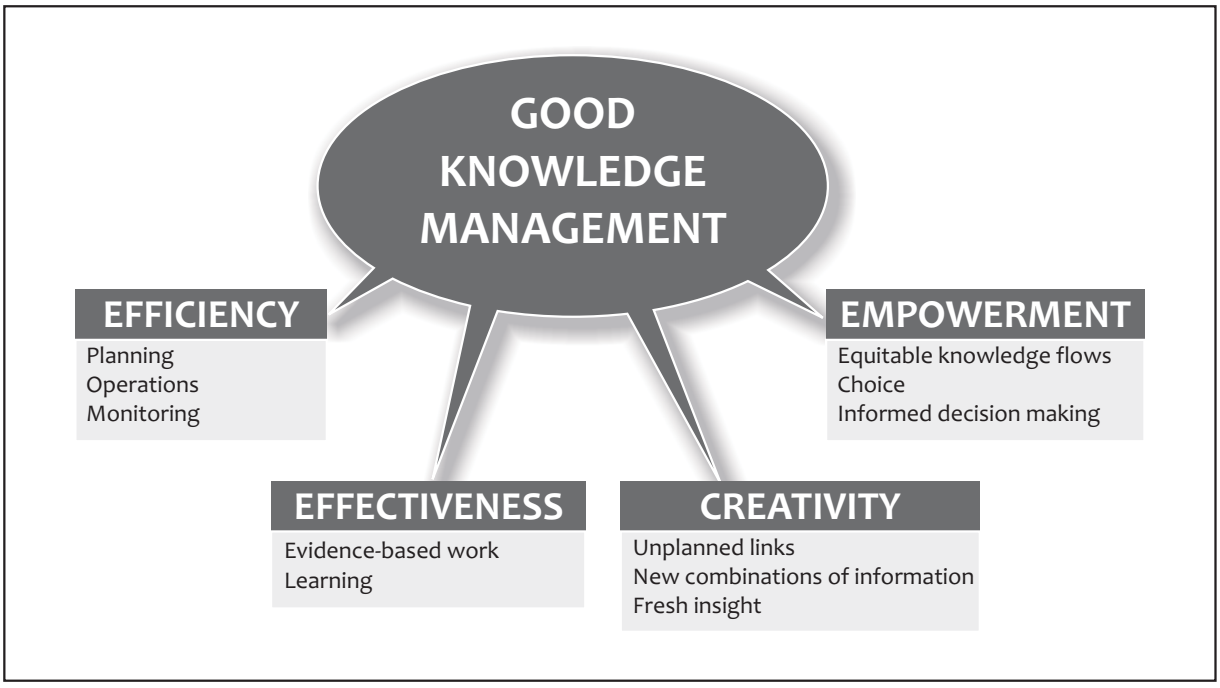
As Jorbie (op. cit) posits, just as KM techniques are essential in capturing and sharing local tacit knowledge, they are also key in engendering the social capital and information sharing mechanisms needed to foster successful economic clusters. Africa needs to appreciate the importance of knowledge to steer clear of the pressures being exerted by the global recession.

The development and application of such knowledge and its social base depends on relationships among government, the private sector, civil society and the wider population. Due to political-economy factors, it is possible to organize the resources of a country in such a way that the incentives to increase productivity are killed and the country's economy stagnates and via off-course its optimal development path. As the UNDP (2001: 2) put it:

> "Information and communications technology can provide rapid, low-cost access to information about almost all areas of human activity. From distance learning in Turkey to long-distance medical diagnosis in the Gambia, to information on market prices of grain in India, the Internet is breaking barriers of geography, making markets more efficient, creating opportunities for income generation and enabling increased local participation".

Knowledge can become a major economic development driver, but also a means of deepening democracy and socio–political freedom. Figure 4 overleaf highlights the pillars of good Knowledge Management for sustainable development. In such a situation, the four multidimensional pillars always seek to enhance efficiency in planning and operations monitoring; improve effectiveness via introduction of evidence based knowledge and learning, spur on creativity stemming from fresh insights, and new combinations of information; and, finaly empower staff to make informed decisions.

Figure 4: Elements of good Knowledge Management for sustainable development.



Source: Infomation Management for Development Organisations (second edition) by Mike Powell (2003)

There are two broad other elements for knowledge to be an impetus for sustainable development for the achievements of the MDGs.

(i) In the short-term there must be improved exploitation of information and knowledge resources to an organization/institution; and

(ii) In the long-term one must:

a. Build new foundation for improved business advantages and strengthens the capabilities for a sustainable future
b. Have the ability to overcome complex issues, give quick responses & facilitate well-informed and timely decisions
c. Encourage the enhancement of knowledge to spiral vertically through the organizational hierarchy
d. Protect against loss of knowledge due to retrenchment, staff-turnovers,
e. Increase organizational knowledge, eliminating duplication of efforts (research and development).
f. Stimulate innovation and knowledge-based entrepreneurship
g. Strengthen knowledge markets to help breed incentive and stimulate knowledge based entrepreneurship, new business models and rapid innovation
h. Take advantage of major opportunities
i. Acknowledge that the scale of the global knowledge-based and creative economy is already several trillion dollars and growing thus will continue to be a major factor in the economy of the future
j. Tap into an economy of abundance
k. Appreciate the scope of knowledge economy is boundless. Such potential will result in improved human development, poverty alleviation and greater social well-being

l. Practice smarter resource utilization and plan strategically
m. Cleaner environmental footprints and smarter/intelligent wealth creation; and
n. Unlock hidden growth potential as knowledge industries grow rapidly and multiply employment opportunities through self-employment & growth in SMEs.

V. WHAT ARE THE IMPLICATIONS OF THE KNOWLEDGE ECONOMY FOR AFRICA?

Given all the movement towards global firms and a global economy, why should Africa worry about the competitiveness of Africa? Given the balkanized African market, one can be certain that there will always be firms on the continent that are not severely exposed to the forces of foreign competition. So why worry? The worry in real terms comes down to the quality of life Africans can lead and the possibility of achieving the MDGs. If Africa's deficiencies in management, technology, science, and the work ethic lead its economies to have significantly lower productivity than other countries, this has implications for the standard of living and poverty reduction in Africa. With lower productivity no firm, or African country, will be able to compete effectively with the rest of the world. Economic difficulties at home would necessarily force skilled African labor to move to foreign countries to find jobs, much as has happened in Europe, with strong economies such as the German economy drawing many immigrants. That prospect is not good and makes it critical for African countries to find ways to increase the productivity of labor and capital locally through greater market integration and efficient Knowledge Management. Africa must develop the knowledge that will enhance manufacturing capabilities in a number of industries to a position of strength with regard to other countries. KM should be put at the core of any policy to enhance value–addition, foster sustainable development and the achievement of the MDGs.

VI. CASE STUDY: IMPORTANCE OF KNOWLEDGE, TECHNOLOGY TRANSFER AND INNOVATION FOR SOCIAL TRANSFORMATION IN KENYA AND UGANDA

The transfer of technology assets from one country to the other has been a subject of great debate especially after the 1970s (Konde, 2006). Transfer of technology has been defined as the "transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service and does not extend to the transactions involving the mere sale or mere lease of goods"(Konde, 2006:3). Konde further notes that transfer of technology transactions include: a) the assignment, sale and licensing of all forms of intellectual property, except for trade-marks, service-marks and trade-names when they are not part of the agreement; b) the provision of know-how and technical expertise in the form of feasibility studies, plans, diagrams, models, instructions, guides, formulae, basic or detailed engineering designs, specifications and equipment for training, services involving technical advisory and managerial personnel, and personnel training; c) the provision of technological knowledge necessary for the installation, operation and functioning of plant and equipment, and turnkey projects; d) the provision of technological knowledge necessary

to acquire, install and use machinery, equipment, intermediate goods and/or raw materials which have been acquired by purchase, lease or other means; and e) the provision of technological contents of industrial and technical cooperation arrangements.

Technology transfer therefore describes the movement of knowledge or technologies across contexts – inter-regional, intra-regional or organizational (Simpson, 2006). Knowledge extraction and diffusion is an important process of technology transfer and innovation for social transformation.

Dubios et al. (2006) conducted a case study of technology transfer through private-public partnerships in Kenya and Uganda for endophyte-enhanced banana tissue culture. The development of this 'technology' was considered important because the lack of clean planting material has been a major constraint for banana production in East and Central Africa. When establishing new fields, tissue culture plantlets reduce damage by banana pests and diseases. Pest infestation or re-infestation, however, remains a major concern. Fungal endophytes, when inoculated into banana tissue culture plants, are known to extend the benefits of clean planting material. Endophyte-enhanced tissue culture technology has been developed at the International Institute of Tropical Agriculture (IITA) to enhance banana productivity. They report that "[T]issue culture production facilities in Uganda are in their infancy, while in Kenya the situation is more developed. Public-private partnerships between IITA and Agro-Genetic Technologies Ltd (AGT Uganda), and Jomo Kenyatta University of Agriculture and Technology (JKUAT) (Kenya) have recently enabled IITA's project to make great progress towards bridging upstream research and downstream technology transfer" (Dubios et al., 2006: 18). Additionally, unexpected synergies have emerged through mutual exchange of information and experience.

So what have been some of the results of the IITA/AGT/JKUAT initiatives? Firstly, AGT's main source of sales has traditionally been nongovernmental organizations and institutions, such as Caritas and the National Agricultural Research Organisation (NARO). However, direct marketing channels with farmers are being sought, by conducting seminars in local farming communities, participating in local exhibitions, distributing brochures, and publicity on the radio. To bring the technology near to farmers, AGT has established nurseries and demonstration gardens in 11 locations in Uganda, which act as sales and training centers, respectively. At the nurseries, sales are facilitated through establishment of direct contacts with individual farmers or farmer groups. 'Farmers' nurseries make tissue culture plantlets available directly to the farmers, prevent farmers from sourcing planting materials from neighboring farms and, by doing so, reduce the spread of pests and diseases. These nurseries also allow farmers to acquire the desired cultivars in any numbers and at any time of their choice, reduce transportation costs of the ready-to-plant material, and avoid transportation of soil from place to place since the tissue culture plantlets are delivered there in vitro. There are also some indirect spillover effects, such as knowledge distribution to farmers about modern agricultural practices, job creation through recruitment of nursery operators, and fulfillment of the Uganda Government's policy and ambition of modernizing agriculture. Therefore AGT has fostered an approach that aims for sustainable social-economical and agricultural development for Ugandan farmers, because AGT is an innovator and needs to create its own market Areas of innovation include joint exhibitions with research organizations (including NARO and IITA), tissue culture protocol development and student internships with universities (Makerere University), and participation in national biotechnology and biosafety policies (Ugandan Government).

A major constraint of AGT has been the absence of awareness and distribution channels. This problem creates a vicious circle, as lack of sufficient sales inherently renders tissue culture plantlets expensive due to lack of economics of scale. Other constrains faced by AGT are lack of protocols and equipment (Dubios et al., 2006: 21). Secondly, JKUAT through the venture has succeeded in transferring banana tissue culture technology to small-scale farmers in Kenya and now produces, on a commercial scale, close to half a million tissue culture plants per annum based on a highly efficient network of farmer co-opted nurseries that it helped develop.

Reflecting the case with AGT, JKUAT reportedly realized that the lack of access to, and familiarity with, this technology was a key hurdle to small-scale farmer adoption. JKUAT, however, attracted funding to investigate channels to disseminate the technology. With support from the Rockefeller Foundation, JKUAT facilitated distribution systems that interfaced the JKUAT laboratory with small-scale farmers in the Mount Kenya region of Kenya. Using a participatory approach, JKUAT engaged in impact studies that enabled an in depth understanding of the local farming systems, the environment in which the farmers were operating, and, most importantly, a community action plan for adoption of tissue culture (Dubios et al., 2006: 22).

Finally, in addition to the commercial laboratories providing a vehicle for tissue culture plants, the tripartite collaboration has driven IITA and the project activities along commercial thinking. Towards achieving the goal of a useful product, this change in forward thinking has been a beneficial exercise, which provided farmers with improved, cost-effective products. Such 'fine-tuning' of techniques and adaption to the practical realities is essential to bridging upstream research with downstream application. A perfect example has been IITA's experimental protocol for endophyte inoculation. Based on extensive research, IITA devised an inoculation technique that seemed optimal: tissue culture seedlings, after they were removed from the tissue culture flasks, were grown in a nutrient solution for an additional month to enhance root biomass. Collaboration with JKUAT and AGT forced IITA to 'think commercial'. IITA quickly abandoned its use of a nutrient solution in favour of fertilizer-amended soil, along the lines of the system used in the commercial nurseries. Based on IITA's highly positive experience, such public-private partnerships should be introduced as early as possible in the developmental stages of activities to maximize the benefits to research for development (Dubios et al., 2006: 23). These interactions across sectors and communities or groups in society have unleashed latent potential in banana growing.

The lesson one can drawn is that societies that interact more frequently and easily discover more– indeed the advent of the mobile phone has helped strengthen the urban-rural research interface. There is therefore a need for creating and enhancing environments whereby this type of interaction takes place. This could explain why enhanced participation and inclusion leads to better development results—because of speedier and more effective learning among other things.

VII. ACBF'S POSITION AND POSSIBLE ROLES.

Given the discussions in the previous sections, ACBF, as a premier capacity building partner for Africa, has an inimitable strategic position and to cultivate and strengthen an integrated continental approach to Knowledge Management that recognises:

- Africa's capability in terms of finance, industrial knowledge and IT infrastructure is significantly low to ensure effective knowledge harnessing;

- Given the speed with knowledge is being produced and expended, ACBF could develop new models to get ideas to champion capacity building in emerging areas such as climate change, energy security, managing shocks, developing robust and savvy leadership, etc;

- At present there is low level integrated continental policy making (e-Strategies), mainly due to inadequate awareness; lack of expertise and institutional knowledge; lack of research and development from African context; and, lack of harmonized policy frameworks. Putting in place spaces for such integration in thinking to take place is critical—as has been shown by the value created by Policy Units in a short amount of time;

- Core areas of ACBF interventions deal with policy and programme development to improve Africa's self capabilities in public service, which is mainly encompasses the adoption of best practices and technologies. ACBF is well position to facilitate the development of policies, frameworks and systems in line with Knowledge Management. This could mean changing the way the current Technical Advisory Panels and Networks (TAPNETs) operate and nurturing new networks that will truly tackle the challenges of the 21st Century;

- ACBF is better positioned to facilitate the promotion of Knowledge Management awareness and capacity building across Africa's public institutions, academia and democratic societies; foster continental and international cooperation; and cultivate a culture of harnessing knowledge. In line with the recommendations of the UN and AU, develop training programs, fora and continental Resource Hub for the exchange of knowledge, expertise and resources to promote and advance the legitimate use of Knowledge Management for development; and

- ACBF has been examining what factors affect the development of an enabling Knowledge Management environment and local competency in Africa.

Also as a way of supporting innovations, ACBF has recently been involved in a number of initiatives:

- Supporting skills buildings through training (as the proposed project under preparation for African Institute of Science & Technology - a Nelson Mandela Institution (NMI AIST) in Abuja, Arusha and Ouagadougou to train engineers and scientists at the regional level and our programs in the area of agricultural policy with universities like GIMPA);

- Supporting leadership development (as cases are with the Africa University (AUU Cadre), Ghana Institute of Management and Public Administration (GIMPA) and the four university partnership between Sciences Po, Makerere, GIMPA and 2iE where leadership development courses are being supported by ACBF);

- Supporting policy reform in the enabling environment for private sector activity in our professionalization of the voices on non-state actors programs and in getting voices of civil society, all of which are critical inputs to support innovation systems;

- Enhancing knowledge storage and dissemination (the Association of African Universities (AAU) project which collects all the thesis published in Africa and the support to African Economic Research Consortium (AERC) as well as the Technical Advisory Panel and Networks);

- Support the exchange of ideas in the practice areas of design and innovation— through supporting forums for exchange and online discussion forums such as AfCOP, etc; and

- Supporting collaborative research at the regional level (AERC) and the sharing of policy ideas at the country and regional level (through up to 27 policy units and think tanks).

VIII. CONCLUSION

It has been argued in this paper that the culture of Knowledge Management is an ongoing journey of innovation, adoption as well as adaptation. Awareness and training efforts in all sections of Africa's society must be continuous if the continent is to meet the MDGs. Even though there have been areas of notable success in socio-economic transformation, there is need for follow through on measuring effectiveness and training efforts should focus on emerging challenges. It is important to note that no country or society/organisation can "go at it alone" thus the need to enhance regional integration and synergy amongst CoPs. Africa needs to exchange know-how as better knowledge sharing will continue to be a powerful tool for tackling our collective knowledge deficit and development constraints. Equally, Africa needs to foster transformative leaders who can make sound/evidence-based choices and coordinate a collaborative effort. There is also need to find innovative ways of financing Knowledge Management amongst other public goods. The continent could experiment with private-public partnerships and devise effective legal frameworks for Knowledge Management to tackle externality difficulties. Such an approach would give a more holistic view of Knowledge Management, including indigenous knowledge. ACBF can strategise and lead this journey in collaboration with its Africa-wide stakeholders and partners. It's in this way that knowledge can be harvested and harnessed effectively for the achievement of the MDGs.

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