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RE-THINKING THE POWER OF INDIGENEOUS KNOWLEDGE FOR ADVANCING INNOVATION IN THE DEVELOPMENT OF RURAL COMMUNITIES IN AFRICA

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ABSTRACT

This paper highlighted the potentials of indigenous knowledge in advancing innovation and development in rural communities in Africa. It further made a critical excursion into the different types of indigenous knowledge existing in African rural communities, which could serve as an innovative system and a source for rural community development in Africa. The paper also presented both the reasons and limitations why rural communities in Africa are not developing as a consequence of ignoring their indigenous knowledge and subscribed to the western model of innovation and development. The paper also proposed a conceptual model through which rural communities can rethink and revisit the potentials of indigenous knowledge for their development rather than relying on the western innovation and development.

Introduction

The history of Africa's Indigenous Knowledge (IK) production did not begin with the coming of western knowledge systems, and neither should their future depend exclusively on western and other worldviews. Like other human societies, African indigenous societies have, for centuries, developed their own sets of experiences and explanations relating to the environment they live in (Kimwaga, 2010). Realizing this, it is pertinent to say that the context of innovation in African is embedded in the IK , socioeconomics and cultural backgrounds. It is considered to be an innovation: a technology, a social, an economic, a philosophical, learning and governance systems of a community, which can be learned through the culture and experience. Learning is perceived and how people actually learn is culturally specific. As such, diifferent cultures have different ways and experiences of social reality (Matike, 2008). The experiences are influenced by people, worldview and belief systems of the natural environment, including the socio-economic and ecological context of their livelihood. These culturally and locally specific ways of knowing and knowledge production are often referred to as indigenous, traditional, ecological, community or local knowledge systems.

These encompass sophisticated arrays of innovation, information, understanding, and interpretation that guide interactions with the natural ambiance: in agriculture and animal husbandry, hunting, fishing, natural resource management, conflict transformation, health, the naming and explanation of natural phenomena, and strategies to cope with fluctuating environments (Semali & Kincheloe, 1999; Lander, 2002; Kante, 2004; Horsthemke, 2004). To this extent, Africans have seen their cultural, traditional and indigenous knowledge as innovative, as effective process and application for development. "Innovation" has been in existence since the beginning of Africa but changing over the years. In this context, innovation can be perceived as an application of intellectual capacity and capability of humans into scientific process of development in societies. The idea of innovation is embedded in different disciplines such as economics, management sciences, communications, technology, information science, medical sciences, and agricultural sciences. In all these disciplines/areas, innovation is seen as a

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process that brings together different novel ideas in a way that they can have impact on the society. For thousands of years, the African indigenous knowledge systems existed as an innovative process for development, long before western innovation was introduced by the European colonialists and missionaries. The introduction of the western innovation meant that Africans faced the conflicting demands of the new innovation with those of their cultures. This is because the purpose, content, and processes of knowledge and cultural transmission necessarily conflict with IK. In various communities in Africa, there exists IK that can be meaningfully integrated to advance innovation, which can also be improved upon for sustainable development.

Thus, IK refers to an indigenous creativity, innovation and technologies developed by local people in order to solve particular problems in their communities, using indigenous materials and relevant natural resources. It can therefore play a key role in the design of sustainable development systems in Africa, as achieved by many countries in Asia and other parts of the world. It is seen as the sum of experiences and knowledge or innovative activities of a given people within the African communities, which can form the basis for development. This knowledge and experience have accrued over many centuries. Yet, IK has often been overlooked by Western scientific research and development (Warren, 1988). It is based on this premise that this paper revisits the power of IK with a view to proposing how African can be used to advance innovation, leading to sustainable development in African rural communities.

Indigenous Knowledge

The term "Indigenous Knowledge" has diverse meanings from economics, library and information science, social anthropology to development studies. It is often referred to in different ways including, but not limited to local knowledge, traditional knowledge, indigenous technical knowledge, peasants' knowledge, traditional environmental knowledge and folk knowledge (Sillitoe, 1998). There are common threads in the definitions of IK. In the context of Africa, it can be seen as any traditional knowledge that is practiced locally by people in order to earn a living. This could be found in different economic, social, agricultural, health care, and technological activities that local people practice in their individual communities. It is in line with this that scholars posited divergent views on it. To some, it means local knowledge that is unique to a given culture and acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of the environment in a given context (Chikaire, Osuagwu, Ihenacho, Oguegbuchulam, Ejiogu-Okereke, & Obi, 2012). To others, IK encompasses the type of experiences and knowledge that form the local economic / market activities and engagements by local people that constitutes the core of community sustainable development processes such as agriculture; food production and packaging, product development, textiling, tools and implements, traditional mode of preserving food; storage and treatment of water; animal husbandry, traditional medicine, transportation, oral traditions, innovation, technology, social, economic and philosophical, learning and governance systems for a given culture, community and society, (Chikaire, Osuagwu, Ihenacho, Oguegbuchulam, Ejiogu-Okereke, & Obi, 2012).

According to Howden (2001) IK systems are better understood as practical, personal and contextual units, which cannot be detached from an individual, their community, or environment (both physical and spiritual). From this definition, one can understand that IK exists in any given socio-economic activity in African societies and it plays an active role in the culture of the local people, and serve an important purpose in relation to productive activity within the community or society. In similar context, Warren (1991) and Johnson (1992) view it as a body of empirical knowledge and beliefs handed down through generations of long-time inhabitants of a specific locale, through cultural transmission, about the relationship of living beings with each other and their environment. Hence, IK can denotes an interesting and all en-compassing knowledge of the local people acquired over generations by different members of the communities as they interact with the environment, which incorporates technology, economics, agriculture, and medicine. However, it is becoming history in most African communities

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because it is seen by many as complex and lacks innovation in which the cultural, socio-economic life of indigenous peoples was maimed or killed (Abah, Mashebe & Denuga, 2015).

IK encompasses different types of relationship between people, their natural environment and the use of natural resources. These relationships reflected in language, social organization, values, institutions and laws of a given community. The recognition of IK is thus crucial for economic and cultural empowerment of indigenous people in particular, and the world in general. Notwithstanding the increased awareness about the role of IK in the socio-economic development of developing countries, Africa continues to be labeled and misconceived at international level (Nwokeabia, 2003). Africa plays only a marginal role in the development processes and its drive towards poverty alleviation is neglected. The misconception is aggravated by the little or no growth in the economic sector and lack of understanding of the context in which practitioners apply the IK, especially in traditional medicine. Consequently, IK is being lost under the impact of modernization and globalization processes. There is, therefore, the need to protect and further develop the knowledge generated and perpetuated by local communities through deliberate policy and institutional reform programmes.

Types of Indigenous Knowledge in Africa

In many communities in Africa, there are different types of IK, which can be meaningfully integrated into the economic development and empowerment of African societies. These include:

1. *Food and Agriculture*

One of traditional knowledge that is of paramount importance to Africans is Food and Agriculture, because they provide the mainstay of the African economy, as most African countries depend largely on agriculture. They are seen as traditional systems which have developed over time with cropping patterns based on African traditional knowledge system expressed in the local language and culture. These traditional knowledge are in the following areas: crop productions, tools and implements, production and crop security, marketing and repackaging of agricultural products, planting and cultivation system, mixed plantation, manure and fertilizers, storage facilities, trading and transportation, production and processing etc. In Africa all these processes are carried out using local knowledge based on cultural norms and values of a given community.

2. *Science and Technology*

In the area of science and technology Africans have done well in the development of local engineering and technology. African people improve their livelihood through the use of simple technology. Many of these African communities work on evolving and developing technologies that improve the local socio-economic activities for the development of small local enterprises. These include: soap making, oil refining from local materials, textiling, shoe making, bee-keeping, block making, dying, tannery, mining, carving and architecture, etc. In various parts of Africa building s of various dimensions, shapes and types emerged reflecting various concepts, techniques and decorative principles and specific raw material preferences as well. Builders integrated the concept of the arch, the dome, and the use of columns and aisles in construction.

3. *Medicine and Health Care Delivery*

Africa has an extremely rich biodiversity that is yet to be fully fathomed. Indigenous knowledge systems that help in the treatment of diseases through spirituality and the science of herbs and plants, on the one hand, and animal products on the other. Traditional/indigenous knowledge exit throughout Africa in area of indigenous medicine, pharmacology, human and veterinary medicine. Africans like other peoples elsewhere, heavily rely on plants and animals for their traditional medicine. They use traditional medicine in protecting and restoring health issues that existed before the arrival of modern medicine. As the name implies, this type of medicine differs from one country to another and have been transferred from generation to generation. In a study conducted in Ghana, Appiah-Opoku (1999) established distinguishing features of indigenous

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healers who provide health care with plant, animal or mineral substances and use methods that are based on socio-cultural and religious beliefs of the people. The following categories of indigenous healers were identified: herbalists, traditional priests (female priests, traditional birth attendants, and bone setters). Herbalists, for example, are knowledgeable in the medicinal uses of herbs and other naturally occurring substances, while bone setters use herbs and other naturally occurring substances to heal patients with fractured bones, ((Appiah-Opoku, 1999).

4. Natural Resources and Biodiversity Management

There are several mechanisms used by Africans to protect bio-diversity through local knowledge. Many countries in Africa are making efforts to conserve the knowledge of the environment which is being lost in communities. For many village dwellers, the forest fulfils many functions: it serves as protection, provides them with medicinal plants and food, and is a place for the conservation of fauna and flora (Appiah-Opoku, 1999). IK creates a favourable damp microclimate for rural activities in the surrounding fallow lands. It also serves as a place for important socio-cultural meetings and serves as a last living testimonial for future generations of what a true forest is. In West Africa the ancient tradition of community forest management seems to hold the ancient keys for a meaningful model of forest conservation, (Appiah-Opoku, 1999).

5. Disaster Management

From time immemorial, natural disaster management in Africa has been deeply rooted in local communities which apply and use indigenous knowledge to master and monitor climate and other natural systems and establish early warning indicators for their own benefit and future generations. In Africa, local communities had well-developed traditional system for environmental management and coping strategies, making them more resilient to environmental change. This knowledge has had a high degree of acceptability amongst the majority of population in which it is preserved. Many communities can easily identify with this knowledge and it facilitates their understanding of certain modern scientific concepts for environmental management, including disaster prevention, preparedness, response and mitigation, (Appiah-Opoku, 1999).

6. Arts, Crafts and Materials

Africa is well known for its wood carving, beads, weaving, textiles, pottery and rock art, sculpture, basket weaving, etc . African traditional crafters harness and direct their creativity towards art as well as the medium scale production of craft products. The crafters usually develop craft products that are relevant and attractive to broad local and international markets. Other indigenous knowledge by Africa include, orature, textiles, dress-making, music and dance, (Appiah-Opoku, 1999).

7. Building Technology

Africa is blessed with beautiful buildings and designs that have been classified among ancient, medieval and contemporary Africa building, because of decorative principles and specific raw material preferences. These buidings are constructed in various dimensions, shapes and types that emerged reflecting various concepts, techniques and cukture of Africa. African builders integrated the concept of the arch, the dome, and columns and aisles in their construction. The artistic talents of the Venda people create an opportunity of integrating art and building as has been done in the past. This can further be developed by integrating modern technology with IK, thus establishing a potential new form of building system, (Appiah-Opoku, 1999).

The Power of Indigenous Knowledge

Knowledge is power, because it is the cornerstone of any development. In the 21st century, the development of any nation lies in the investment it made on knowledge or education. This is to say that knowledge and development have a symbiotic relationship, hence the recognition of the power of IK as a valid source of knowledge and innovation for the good of any society. It is vital to the cultural tradition of

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Africa that encompasses innovation, creativity, education, language, technology, systems of classification, resource use practices, and social interactions, that is highly embedded within the philosophical framework of Africans. The power of IK can be an invaluable alternative to African countries, because it has utility value in indigenous communities. It is experiential in nature and addresses diverse and complex aspects of indigenous peoples and their livelihoods. Its power can be seen as a process through which indigenous people take into account their cosmos, spirituality, ontological realities, land, sociocultural environment and historical contexts; which can be transmitted, maintained and retained within specific cultural sites for education and sustainable development (Shizha, 2013).

Prior to the advent of technology, rural people in Africa relied heavily on IK to regulate their activities, which in turn, enabled them to live in harmony among themselves as well as within their environments. Indigenous knowledge as practiced then covers all forms of knowledge, such as technologies, know-hows, skills, practices, and beliefs. This knowledge is transmitted from generation to generation (Abiodun & Omolere, 2012). The global community has acknowledged the power and importance of IK. Therefore, for it to survive, the social and economic context in which it is found has to be nurtured, maintained and protected. Therefore, it is necessary to recognize and respect the rights of holders and practitioners as the living libraries of indigenous knowledge in Africa. The power of IK is evident in its legitimacy and credibility in the eyes of both local people and scientists, increasing cultural pride and thus motivation to solve local problems with local ingenuity and resources (Ajibade, 2014). IK can thus provide a powerful basis from which alternative ways of managing resources can be developed. The use of traditional technologies and know-how, as well as the locally available skills and materials are often more cost effective than in exotic technologies from outside (IIRR, 1996). Conversely, local people are familiar with local technology and so do not need any specialized training.

Over the past ten years, there has been a dramatic interest in the power of IK regarding sustainable development. This interest is reflected in a myriad of activities generated within various African communities where IK systems are now regarded as an invaluable national resource; and also within the development community where IK provides opportunities for designing development projects that emerge from priority problems identified within a community, and which build upon and strengthen community-level knowledge systems and organizations (Ajibade, 2014). It may not be accidental that the growing interest in the potential power of IK to development is becoming manifest at a time when current development models have proven not too successful. To this end, the power and relevance of IK can best be appreciated through the presentation of the following examples. Howes and Chambers (1979) for instance, observed that IK can be used either to economize the scarce scientific manpower, or to extend the range of observations upon which science can draw from.

Ajibade (1999) explained the power and relevance of IK, particularly in resource conservation, noting that indigenous societies have profound and detailed knowledge of the system and species with which they are in contact for generations. Richards (1979) affirms that many traditional beliefs and attitudes to environmental resources are oriented to conservation rather than exploitation. He further submitted that indigenous natural resource management techniques are not primitive, destructive or ineffective contrary to the belief of many policy makers and western scientists. They are considered as being sophisticated, scientifically valid, productive and appropriate. This is particularly true of the power of IK for advancing innovation. Biggs and Clay (1981) noted that some of the most successful innovations in Asian agriculture have had their origin in the traditional knowledge.

The power of IK is further buttressed in the work of Bunch and Hopez (1995) which identified local innovations as one of the factors which the Association of Advisors for a sustainable, ecological, and people-centred agriculture sees as absolutely critical to the villagers becoming the subject of their own development. Mishra (1989) on the other hand, witnessed the use of IK in curing certain diseases in North India. This, according to Pine, et.al. (1992), works more slowly but is more thorough and effective than western pharmacology. Modern science, according to Mishra (1989), has confirmed the veracity of some IK. For instance, Cucurbit leaves have been found at Iowa State University to have some chemicals

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that help to lower cholesterol. The leaves of allium species (onion, garlic, etc.) have been found to prevent ulcer. The Neem tree has also been found by the International Rice Research Institute (IRRI) to have certain chemicals with properties to serve as insecticides (Ajibade, 2014).

In spite of the established power of IK, appreciating its utility is, however, difficult for many development workers as they have to admit that they are not the experts; hence, the need to concentrate efforts on its acceptability. The above justification for revaluing KM does not, in any way, depend on an assumption that such knowledge is superior to modern knowledge. It is just that rural people know useful things which other people do not know (Ajibade, 2014). As such, it is more likely that rural people will work a new technology they themselves have had a hand in devising, and that they have a good moral claim to participate in deciding their own future on the basis of their own experiences. It is imperative to recognize the need to inculcate this understanding into African rural people so that it will improve their innovation and creativity for sustainable development. This paper believes that rural people must be confident and creative for them to achieve sustainable development. This they can achieve by re-discovering themselves within their own traditions, language, history and environment.

This is in line with the thoughts of the group, which broadly involve the need to understand people's cultural roots in order to know why they do what they do (Ajibade, 2014). It is noteworthy to stress that African societies have been corrupted through the so-called western civilization. Indeed, western civilization has substituted most African ideas, such that our own ways of doing things are abandoned. Unfortunately, there has not been adequate break-through because their introduction did not recognize what was in existence. Consequently, there has been moral decadence among the Africans due to western influence. This particularly calls for re-definition of our concern for our own traditional culture. Vilakazi (2002) asserts that:

> *Healthy and genuine development policies in Africa must be founded upon the principle and pattern of African civilization. The greatest cause of distortion of African development policies is the fact that policy makers have crafted development policies for Africa out of the principles and patterns of western civilization. The triumph of the African Slave Trade, and conquest of Africa by the west, resulted in the rejection of the concept and historical validity of African civilization*.

In this regard, IK:

1. represents a way of life that has evolved with the local environment, so it is specifically adapted to the requirements of local conditions;
2. provides for subsistence needs only: only what is needed for immediate survival is taken from the environment;
3. does not allow for over-exploitation of a single resource; risk is often spread out by utilizing a number of subsistence strategies;
4. conserve the land that is considered sacred, where humans are dependent on nature for survival, and all species are interconnected;
5. is flexible for adaptation of new conditions as it gives room for incorporation of outside knowledge; and
6. allows for strong family and community ties, and with them obligation and responsibility to preserve the land for future generations (Dewalt, 1994).

African intellectuals are rethinking and revisiting the power of IK and engage in research and fieldwork on their own people, with the aim of reconstructing Africa, based on the utilization of the resources provided by African civilization. This, however, does not indicate that other people's ideas cannot be adopted. The fact is that other people's ideas must not be allowed as substitutes to indigenous ideas. People know their local environment and must have developed means (unique to them) of solving various problems. Such ideas may complement the existing ideas for the attainment of a sustainable development in Africa.

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Conceptual Model for Rethinking the Power of IK for Sustainable Rural Community Development

From the above discussion, a conceptual model was proposed. This would serve as a new model for rethinking the power of IK in advancing innovation and sustainable development. This model arose out of a careful consideration of IK as a large body of tapped and untapped knowledge and skills of the local people that enable communities to survive. The dominance of the western knowledge system has largely led to a prevailing situation in which IK is ignored and neglected. It is, therefore, easy to forget that, over many centuries, human beings have been producing knowledge, which enabled them to survive in a balanced relation with their natural and social environment. It is on this premise that this paper proposed a conceptual model for re-thinking and revisiting the power of IK for sustainable rural community development.

The proposed model was carefully developed, taking into cognisance that IK is dynamic as a result of a continuous process of experimentation, innovation, and adaptation. It has the capacity to blend with knowledge based on science and technology, and should therefore be considered complementary to scientific and technological efforts to solve problems in social and economic development in rural communities. The model also looked at the complex nature of the IK, which was developed around specific conditions of populations and communities indigenous to a particular geographic area. This population retains some of, or its entire own social, economic, cultural and political institutions, but by the nature of the rapidly changing society around us, this inheritance is quickly disappearing and in danger of being lost forever. The central idea of the model is that Governments in African need to look at IK as an innovation that is inherent to the rural people, which need to be preserved, conserved and protected. The model has the following components:

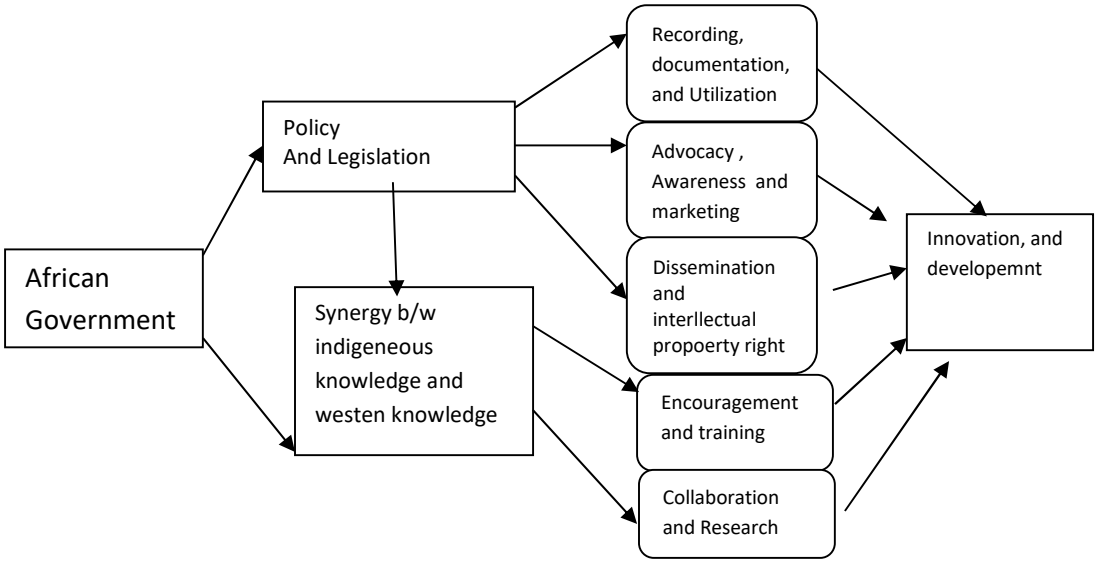

Figure 1: Proposed rethinking model for advancing innovation

1. *Policy and Legislation*: African governments need to place a great degree of emphasis on the development of IK Policy and Legislation, which will significantly protect, develop and promote IK and will also help improve the livelihood and economic well-being of the indigenous communities, by ensuring equitable and fair benefit sharing. The knowledge of individuals and the collective knowledge of communities is the only real competitive advantage that any country can rely upon to develop.
2. *Recording, Documentation, and Utilization*: African countries need to record and document all types of IK existing in their rural communities so that both the scientific and local

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community have access to it and can utilize it in the formulation of sustainable development plans.

3. *Advocacy and Awareness:* There is also the need for advocacy in the rural communities so as to raise awareness about the value of IK in sustainable development. This should be done inline with repackaging the IK in the format such as success stories in songs, plays, story-telling, videos and other traditional or modern means of communication understandable to rural communities.
4. *Encouragement and Training:* There is the need to encourage rural people to take pride of their knowledge; help them to record and document their local practices. Governments should also get local people involved in recording their IK by training them as researchers and providing means of documentation (computers, video equipment).
5. *Dissemination and Intellectual Property Right:* Governments in Africa need to make IK available and disseminate it back to the rural communities through newsletters, videos, books and other media relevant to the need of the rural communities. Also there is the need for intellectual property rights to be given to the rural people based on their local knowledge inform of agreements so that IK is not misused and benefits return to the community from which it originates
6. *Synergy between indigenous and western knowledge:* There is the need for a synergy between IK, Western knowledge and other knowledge systems so that knowledge generation and utilization benefits all segments of society.

Conclusion and Recommendations

The thrust of this paper is that African rural development should be built on locally available resources, primarily, the cultural and environmental experiences of the local people for relevance and sustainability. It is generally accepted that IK exists in Africa and its future is uncertain. Thus, there is the need to legitimatise and validate IK, and also recognise that IK is crucial in the development of rural communities and that the skills and cultures of indigenous people need to be harnessed for their own development. In addition, the power of IK, especially in providing the basis for innovation and sustainable development, which has been ignored for many decades, should now be revisited by many African countries.

This paper therefore recommends the rethinking and revisiting of the power of IK in order to attain sustainable development in Africa. In addition, attempt should be made to encourage the development of policy and legislature for IK through which technical knowledge can be created, accumulated and stored where it can be retrieved for manipulation and usage for sustainable development. This paper finally proposed a model to remind Africans that they should not be deceived by any imported ideas. This is because rethinking and revisiting the power of our IK can lead us to the promise land of sustainable development through innovation.

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