INDIGENOUS KNOWLEDGE MANAGEMENT FOR SUSTAINABLE DEVELOPMENT IN NIGERIA: A PROTOTYPE FOR ADOPTION

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Abstract

This paper discusses indigenous knowledge management for sustainable development in Nigeria, using Nonaka's Socialization, Externalization, Combination, and Internalization (SECI) model as a prototype for adoption. Indigenous knowledge (IK) popularly known as traditional knowledge has its numerous benefits, with a high capability of contributing positively to sustainable development in Nigeria if it is rightly utilized and applied to diverse situations. This paper discusses the categories of IK, benefits of IK, and knowledge management procedures in managing IK, among others. It also identified some challenges limiting the use and application of IK such as low recognition of IK, lack of IK policy, and hi unwillingness on the part of the custodians to share IK among others. As concluded in this paper, Nonaka's SECI model should be adopted in promoting a viable and feasible solution to the numerous problems affecting the proper management of IK and scientific knowledge (SK) in Nigeria. The adoption of this model would help to improve the capturing, sharing, and utilization of indigenous and scientific knowledge in local and non-local communities in Nigeria. Also, this model will also help in bringing out striking areas of differences and similarities in the application of IK and SK; thereby promoting sustainable development rather than segregating one as inferior to the other.

Keywords: Indigenous knowledge, Sustainable development, knowledge management, Model, Adoption

Introduction

Indigenous Knowledge (IK) popularly known as local knowledge, has been in existence from time immemorial. This type of knowledge exclusively lies with the local people in diverse communities globally. It is collectively owned by the local people whether in a village, clan, family, or community setting, therefore, nobody claims individual ownership of this knowledge. It is usually passed from one generation to another, mostly through oral transmission from the custodian of the knowledge to the next person in the order of ranking and seniority in the community. IK can also be seen as the accumulation of facts gained from practical experiences and observation among the local people (Morrison, 2025). Another unique feature of IK is that, it is not documented in any form, except in the minds of the custodians of this knowledge, thereby limiting it in scope and application (Yusuf and Olusegun, 2015). Examples of this type of knowledge include traditional medicine, food, farm practices, handcraft, artwork, folklore, plants and animals, and historical events associated with diverse communities, among others (Haines and Du, 2015). On the other hand, scientific knowledge (SK), also known as external knowledge, differs from IK in several ways. For instance, SK is globalized in nature, well documented, and accessible to people as the need arises. It is generated through research and published works, and stored in varying formats to facilitate its level of accessibility across the globe (Lwoga et al., 2017).

Research has however, proven that IK contributes to the sustenance of the indigenous people as well as the sustainable development of any nation at large (Magni, 2016). It is therefore, expedient that IK should be harnessed in meeting Sustainable Development Goals (SDGs) of every nation, both locally and globally. However, there are major challenges faced in the use of indigenous knowledge for sustainable development, most especially in a developing nation like Nigeria. Researchers have identified a number of problems in the utilization and management of indigenous knowledge by local people such as low levels of formal education, poor attitude, low awareness of intellectual property, and political power among others (Lwoga et al., 2017). In a bid to provide solutions to these problems of managing IK, some researchers have identified the use of Information and Communication Technologies (ICTs) in the proper management of IK (Mdhluli et al., 2021; Ocholla, 2018; Hunter, n.d.). However, regardless of the benefits of ICTs, they have not been able to solve totally the problem of accessing and using IK due to the oral

nature of this knowledge. For instance, accessibility to the knowledge holders in a particular community is very germane to ensuring proper capturing of IK from designated persons in the community.

Some other researchers have also identified Knowledge Management (KM) procedures in the proper management of IK. These include processes such as identifying, capturing, sharing, distributing, use and re-use of knowledge (Mdhluli et al., 2021). It was pinpointed that KM procedures are indispensable in the proper management of indigenous knowledge; they also serve as a suitable linkage to accessing scientific knowledge (Mdhluli et al., 2021). Another important way of managing IK is bridging the gap between the indigenous people (knowledge owners) and outsiders (knowledge users); this will ensure that IK is easily diffused. This can be achieved through continuous interaction with the local people, thereby making them feel acceptable in the use of their knowledge. Therefore, the adoption of the knowledge conversion model proposed by Nonaka and Takuechi (1995) is of utmost importance in managing IK. For instance, this model emphasizes on the continuous conversion of knowledge through specific processes which are Socialization, Externalization, Combination and Internalization (SECI). This model is popularly referred to as SECI model, an acronym derived from each of the processes undertaken in the use of the model.

In the light of the above, this paper focuses on the concept of IK, usefulness, categories of IK, concept of sustainable development, relationship between IK and sustainable development goals. This paper will further discuss the relevance of Nonaka's and Takuechi's SECI model as a prototype for adoption for effective management of IK in Nigeria. Lastly, suggestions and recommendations will equally be made for proper management and sustenance of IK for generations to come.

Concept of Indigenous Knowledge

Indigenous knowledge is universally known as traditional knowledge. It can only be found in local communities; therefore, accessing this type of knowledge may involve having direct conversation with the custodians. IK has certain distinct features that differentiate it from scientific knowledge. Several researchers have identified distinct features of IK that distinguish

them from scientific knowledge as highlighted below (Azubuike and Aji, 2021; Sarkhel, 2016; Yusuf and Olusegun, 2015).

i. **IK is local knowledge:** IK is local knowledge; it belongs to people at the grassroots in every society or community. This is the type of knowledge that belongs exclusively to people either within a family, clan, or community collectively, therefore, it is not individually owned.

ii. It is generated within local communities: Local communities own this knowledge; however it can be held by specific people in the community who are often referred to as the custodians of such kind of knowledge.

iii. It is expressed in local language: IK is expressed in the language of those that own the knowledge. This local language may be peculiar to a sect, community, or village. Therefore, utilizing this knowledge, one would need an intermediary to interpret the language, especially to outsiders.

iv. It is location and culture specific: IK is found within specific communities or in their cultures. It is not universal, unlike scientific knowledge that has been captured, documented, and shared for easy use.

v. IK is transmitted orally and not documented: IK is mostly transmitted orally; there is usually no documentation of this type of knowledge. The custodian of IK sometimes transmits this knowledge by word of mouth to the most eligible person in the community.

vi. IK is tacit in nature and difficult to codify: IK is tacit in nature; it is stored in the minds of the owners of this knowledge and transferred from one generation to another. This constitutes a big challenge in the management of IK.

vii. IK is sacred in nature: The sacredness of IK cannot be undermined. Indigenous people are mindful of the fact that IK was handed over by their ancestors; therefore, this knowledge is treated in a sacred manner.

viii. IK is the basis for local-level decision-making: IK is used and applicable in decisions relating to diverse areas in the community such as agriculture, healthcare, food preparation, environmental management, and natural resource management among others.

Based on the above, it is noteworthy that regardless of the distinguishing features of IK, it still shares some essential characteristics with scientific knowledge. Scientific knowledge and IK can be harnessed to attain development goals at local, national, and global levels respectively. Both knowledge have their unique peculiarities, thereby bringing about lasting solutions to varying developmental problems in the society at large.

Categories of IK

Researchers have categorized IK into varying types as discussed briefly below (National Open University of Nigeria [NOUN], 2020):

i.Community Indigenous Knowledge: This type of knowledge is exclusively owned by a community and transmitted verbally only to the members of the community.

ii.Publicly known Indigenous Knowledge: This knowledge is commonly known and used by people with or without documentation. For instance, the medicinal use of herbs and trees to cure ailments and diseases.

iii. Individual Indigenous Knowledge: This type of knowledge is owned by certain individuals in some families or communities. At times, they may be passed down from one generation to another when the custodian of the knowledge dies.

iv. Documented Indigenous Knowledge: This type of IK is documented in different formats which makes it accessible and available anytime it is needed by people. For instance, it can be captured in print, video, and audio formats. However, this category of IK is rarely done, except in cases where it was deliberately captured by the knowledge owners or the users.

v. Vocal Indigenous Knowledge: This type of knowledge is mostly unwritten and orally passed down from generation to generation for the purpose of preservation. However, it can become extinct after a while if it not captured or written down.

vi. Sacred Indigenous Knowledge: This consists of both sacred tangible and sacred intangible rights. Sacred tangible rights are tangible objects that are sacred in nature. Community's right over sacred sites is an example for this category. There are also sacred intangible rights that are

intangible objects that are sacred and belong to a community such as choreography and dances, music, and others.

vii. Secular Indigenous Knowledge: This refers to the communities' right over arts and crafts. It includes rights in photographs, choreography, music, or audiovisual productions used in non-sacred events and ceremonies.

Apart from the above typologies, Bolhassan et al. (2014) also classified IK into three Tiers. which include

Tier 1: Base Indigenous Knowledge

This first tier of indigenous knowledge is shared publicly within the indigenous communities. This type of knowledge is accessible to all, and there is no need to ask for it. This knowledge is imparted during communal events in which everyone can observe, listen or partake. It is the duty of elders to impart essential life skills knowledge to family and community members. This first tier of knowledge provides the base knowledge to enable a person who is interested to pursue this knowledge further. It is often used in communal events such as birth ceremonies, betrothals, funerals, and the commencement of building a house. These events are connected to beliefs and legends and which usually require the total involvement of community members, young and old across the community's structure.

ii. Tier 2: Ceremonial and Ritual Indigenous Knowledge

This type of knowledge is sought by interested persons in the community that have a deep grasp of the base knowledge. These persons will need to pursue acquiring the knowledge further from the knowledge holder by undergoing a period of apprenticeship under the guidance of the knowledge holder. Tier 2 knowledge is at a deeper level of knowledge than Tier 1; therefore, it needs to be shared and transferred by the master knowledge holder based on practice and hands on experience.

iii. Tier 3: Sacred Indigenous Knowledge

This third tier involves a spiritual dimension before it can be successfully transferred by the knowledge holder. Certain types of knowledge within this category need to be sought or

requested from the knowledge holder. These types of knowledge are not accessible to all, except those that have set themselves apart to acquire this kind of knowledge, having the readiness to fulfill necessary sacred requirements. Due to the high level of sacredness attached to this kind of knowledge, some situations may arise where knowledge seekers may be turned away or not 'granted' the knowledge (NOUN, 2020). This could be due to several factors such as age, gender, suitability, or even genealogy.

Benefits of Indigenous Knowledge in Nigeria

The benefits of IK is quite enormous due to its use most especially by local people in several communities in Nigeria. The application of IK in areas such as traditional medicine, health care, food processing, preservation of seeds, agriculture, environmental management, livestock, and natural resource management among others is quite impressive due to its contributions over many years (Okpara & Ikokoh, 2021). Several local communities in different States in Nigeria are known for their indigenous practices in varying areas. There are quite a handful number of indigenous practices in Nigeria as reported by different authors in the literature. For instance, Ugboma (2014) pinpointed that women in Isoko communities of Delta State, Nigeria, use agbo (herbal leaves), which is a combination of pawpaw, guava and mango leaves for the treatment of fever. Also several methods have been used by these women for processing and preservation of kinds of food. Eru for yams, Aha for drying fish and Emoizi for processing of starch. Okpara and Ikokoh (2021) also reported that in the Northern part of Nigeria, animal feces are dried and used as manure to nourish plants. There are several other indigenous practices that have been adopted amongst people living in local and urban areas These practices have contributed to the sustenance and development of the local communities where they are being used by diverse people .

IK and Sustainable Development in Nigeria

Sustainable development can be defined simply "as meeting the needs of the present without compromising the ability of future generations to meet their own needs" (International Institute for Sustainable Development [IISD], 2025) . Sustainable development is a holistic approach to meeting the developmental needs of immediate and future generations to come, and it can only be achieved through strategic planning and proper management of any nation's resources and,

most importantly, meeting the present and future needs economically, socially, ecologically, and otherwise. On the other hand, the goal of sustainable development is to achieve long-term stability of a developing or developed economy and its environment. It entails taking into cognizance economic, environmental, and social concerns in the decision-making process that affects all categories of people in a nation.

However, the extent of contributions of IK to sustainable development in Nigeria is limited compared to the scientific knowledge due to reasons such as marginalization, undervaluation, and lack of policy framework, among others (Adedokun, 2024). In this regard, there is the need for proper documentation, preservation, and protection of IK to enhance its contribution substantially and extensively to sustainable development in Nigeria. It is worthy to note that in spite of the importance of IK to sustainable development, not all IK are usable because some knowledge are no longer relevant in the 21st century due to sociological, environmental, and technological changes (Ellia et al., 2014).

KM Procedures in the Management of IK

The management of indigenous knowledge in Nigeria has been posed with several challenges for information professionals such as Librarians, Archivists, Documentalists among others especially in the area of identification, capturing, codifying, classifying, organizing, sharing, preservation, documentation and use of IK as reported in the literature ((Mdhluli et al., 2021). Therefore, IK can be repackaged to promote its usefulness to non-indigenous users outside the local communities (Mole, Ekwelem and Din, 2018). Repackaging IK needs the use of KM procedures that have been recognized as vital elements in the proper management and preservation of IK (Mdhluli et al., 2021; Lwoga et al., 2017). Each of these processes is thereby discussed briefly below in relations to IK:

Identification: Identification of IK is essential for it to be properly managed. Unfortunately, IK has not been given the due recognition, perhaps due to the local nature of the knowledge. It has to be identified and recognized before it can be useful to any nation. However, identification of IK by knowledge intermediaries has been quite difficult due to a lack of disclosure by the knowledge custodians ; and the sacredness attached to it by the local people.

ii. Capturing: IK can also be managed through proper capturing to contribute to sustainable development. However, capturing IK has been a daunting task for librarians and other professionals due to ignorance of what capturing entails by the local people. For instance, local people may at times exhibit an uncooperative attitude towards the capturing of their IK due to pride of collective ownership, need for protection, and belief system among others. However, the evolvement of ICTs has facilitated easy capturing of IK, especially through specific tools such as audio/video recorders, cameras, radio, and television among others (Ochollo, 2018).

iii. Organization: Organization of IK entails the use of several tools such as indexers, abstractors, classification techniques, and thesauruses among others. However, due to a lack of standardized indexing or classification system, it has been a herculean task for librarians, especially in Nigeria to manage IK (Sarkhel, 2016).

v.Documentation: Documentation and storage of IK in varying formats is essential to facilitate easier and quicker access. However, due to problems revolving around identification and capturing, documentation of IK has not been considerably achieved as expected, perhaps , due to the tacit nature of IK, along with the unwillingness of indigenous people to divulge information relating to its use (Charyulu, n.d.).

vi. Usage: IK can be used to achieve sustainable development of a nation like Nigeria. However, the use of indigenous knowledge has been restricted mostly to local communities; it is yet to be globalized due to the problem of recognition, low awareness, and ignorance on the part of local people. Therefore, the use of IK should be a continuous process in meeting the developmental needs of any nation.

Challenges Faced in the Use of Indigenous Knowledge

IK has contributed minimally to sustainable development in Nigeria when compared to scientific knowledge due to some factors as identified in the literature (Azubuike & Aji, 2021; Lwoga et al., 2017; Magni, 2016). These factors have contributed to the low usage of IK for sustainable development. Firstly, there is low recognition of IK in the formal schooling system, which has contributed to the devaluation of indigenous knowledge in terms of neglect of cultural values and traditions and resistance of the younger nations to imbibe the values of IK transmitted by the older generation. Magni (2016) pinpointed a growing inter-generational gap between the older

and younger generations in the acquisition of IK, thereby leading to low disposition towards the use of IK by the younger generation. For instance, some of the younger generation have associated the use of IK with poverty, primitiveness, and backwardness on account of the knowledge derived from SK. Basically, it is believed that IK is inferior to SK; therefore, it is not given its utmost recognition as expected in our formal educational systems in Nigeria. Primary and secondary educational systems in Nigeria are changing in their outlook towards IK as reflected in the contents of their curriculum. IK can be transmitted to students by offering certain subjects at primary and secondary levels; unfortunately, some of these courses are being scrapped. For instance, history as a subject was scrapped from the curriculum of schools at the primary and secondary levels in Nigeria at a time, but later restored, perhaps due to the realization of its importance to our cultural heritage. There is a need to ensure that IK practices are being taught to students at different levels of education, thereby promoting the use and sustenance of this knowledge right from the inception of formal schooling to the time a student graduates from secondary school education.

Another reason is the negative attitude towards IK, which has contributed to the major set back in its use and applications. For instance, a lot of people have this wrong belief that IK is barbaric, primitive, localized, and backward. IK is seen to be meant for local people; therefore, it should be treated as such. This negative mindset has affected its use greatly, thereby contributing very little to sustainable development in a nation like Nigeria.

Also, the unwillingness of the custodians of IK to share and transmit their knowledge to others stand as a barrier to its use (Azubuike & Aji, 2021). IK is not easily accessible by people due to lack of documentation. Apart from this, some aspects of IK are seen as sacred, thereby some form of secrecy is attached to its use .

Furthermore, there is lack of IK policy in Nigeria, therefore, this has limited its use locally and nationally. There is the need for IK policy which affirms the right of the knowledge owners. The enactment of this policy will further uphold the intellectual property right of the indigenous people. Recognizing and acknowledging the intellectual rights of the local people makes them feel acceptable, and having the willingness to share their knowledge whenever the need arises. The unusual resistance of the local people towards the sharing and use of IK will be addressed with the enactment of this policy.

Application of SECI Model to the Management of Indigenous Knowledge

SECI model addresses how knowledge grows spirally, and the process of converting knowledge from one state to the other through the use of specific processes such as socialization, externalization, combination and internalization. In relations to indigenous knowledge management, SECI model is best applicable due to the continuous need to engage in face to face interaction with the indigenous people, to capture their knowledge and convert it to readily accessible and useable formats. By these processes, indigenous people are re-orientated to continually share their knowledge, and also having the readiness to change their mentality and backward mindset as regards IK. The application of these processes to the management of IK is of utmost importance, as it will assist in solving the problems hindering capturing, accessing and documentation of IK. SECI model is also applicable in the use of IK for the immediate and future generations. For instance, a combination of IK and SK to achieve sustainable development at different levels-locally, nationally and globally is very practicable with the use of this model. These two types of knowledge can be examined closely, synthesized and applied to several areas of development; also it helps in detecting striking areas of differences and similarities in the use of these knowledge and used maximally to the best advantage of any nation.

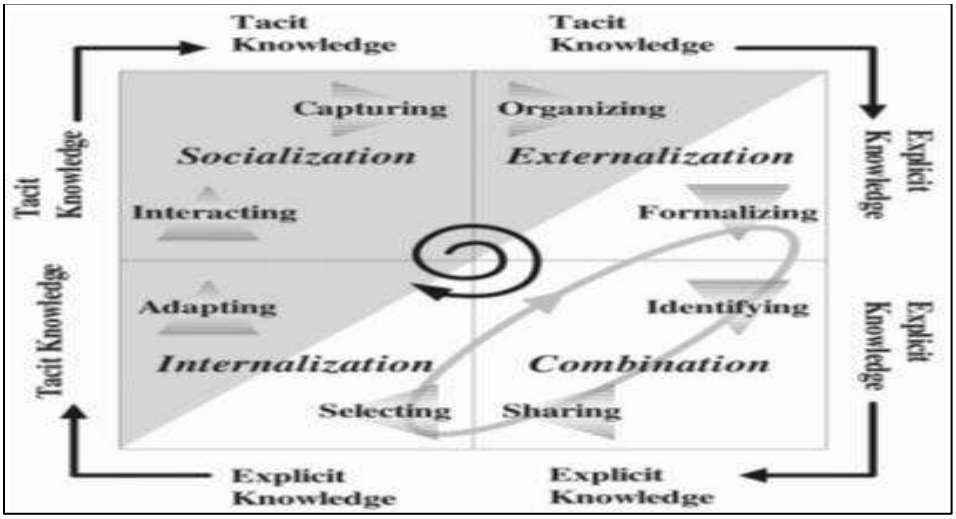
The first process of the SECI model is socialization, which entails the conversion of tacit knowledge to tacit knowledge through face-to face interaction among the parties involved. In relation to IK, it entails regular interaction with local people to capture and access their knowledge. In the course of carrying out this process, both parties will be enlightened on the usefulness of IK and its application. This would help to boost their confidence in the use of IK. Socialization process brings about lots of benefits to the knowledge custodians and knowledge users. A lot of indigenous people's misconceptions are addressed and their hope rekindled due to the relevance accorded to their knowledge by people outside their locality . Socialization can also be achieved through specific activities such as storytelling, music, and dances, among others (Yusuf and Olusegun, 2015).

The second process is externalization, which entails conversion of tacit knowledge to explicit or documented knowledge. This involves documenting the tacit knowledge in indigenous peoples' head through the process of capturing, and sharing amongst people in the local communities. By this process, IK in the minds of indigenous people can be easily documented. Externalization

process can be facilitated through the use of ICT tools for capturing Ik via audio and video recorders among others. Also indigenous technologies can equally be used to make tangible artifacts for the purpose of preservation of IK for posterity sake.

The third process is the combination process which helps in converting explicit knowledge to explicit knowledge thereby, bringing diverse sources of indigenous knowledge together through the process of synthesis, comparison, contrasting, and narrowing down on the best method. By this process, learning and relearning will take place considerably. Combination process allows knowledge to grow, expand and shared amongst the parties concerned. By this process, IK and SK can be brought together for optimal utilization as a way of contributing to sustainable development. A collection of scientific discoveries and IK can be found useful and sustained through this process. Research has shown that using external knowledge improved the livelihood of the indigenous people and their own local knowledge base and activities (Muhammad & Elisabetta, 2025).

The fourth stage under SECI model is the internalization process. This process involves the conversion of explicit knowledge to tacit knowledge. By this process, documented IK or SK can be shared, diffused, and applied to diverse situations within and outside the local communities. Through this method, users are exposed to diverse versions of IK and SK, and applied to several areas of development.



Application of SECI Model to the Management of IK and SK: Adapted from Nonaka and Takeuchi (1995)

Conclusion

This paper has brought to the limelight the usefulness and application of the SECI model as proposed by Nonaka and Takuechi (1995) as a prototype of adoption for the proper management of IK and SK. The adoption of this model will assist in the capturing, sharing, and utilization of indigenous and scientific knowledge in local and non-local communities in Nigeria. This model will help in bringing out areas of differences and similarities in the use of IK and SK; thereby contributing positively to sustainable development rather than segregating one as inferior to the other.

Recommendations

In view of the proposed adoption of the SECI model as discussed in this paper, the following recommendations are hereby made to address the challenges faced in the use of IK ; and equally to promote the use and management of IK for sustainable development in Nigeria:

i. Development of IK policy should be initiated and sustained by the Nigerian government. This will help in adequate recognition and protection of intellectual property rights of indigenous people; acquisition, sharing, and preservation of IK would be easily achieved.

ii. Training and re-training of knowledge intermediaries (librarians, extensionists, custodians among others) on diverse ways to identify, capture, use, and reuse IK for sustainable development.

iii. Orientation and enlightenment of indigenous people on the importance of IK and to change their negative mind set; and promote its contribution to sustainable development.

iv. There is the need to organize forums where indigenous and scientific knowledge can be discussed among researchers and knowledge custodians in local communities as a way of contributing to sustainable development.

v. KM procedures should be undertaken regularly by knowledge intermediaries or gatekeepers to facilitate the identification, capturing, organizing, documentation and use of IK from time to time within and outside local communities.

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