Decolonization of Indigenous Knowledge Systems in South Africa:
Impact of Policy and Protocols

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ABSTRACT

This article analyses the protection of indigenous knowledge in South Africa, exploring if and how indigenous knowledge is aligned with existing policy and protocol frameworks as enacted by the government. Indigenous knowledge is mainly preserved in the memories of elders and shared through oral communication and traditional practices. The question arises: How can knowledge generated in indigenous knowledge systems research be recovered and protected to benefit indigenous knowledge owners and accessible for future generations? The study utilised literature review to critically analyse the policy, protocols, and strategies relating to the protection and preservation of indigenous knowledge systems. Decolonial theory and knowledge ontology and modelling framework were also used as underpinning theories to guide the study. Recommendations suggest the need for decolonizing indigenous knowledge systems through collaborative approach with indigenous knowledge holders and their communities.

KEYWORDS

Colonization, Decolonization, Indigenous Knowledge Owners, Indigenous Knowledge System, Indigenous Research, Knowledge Sharing

INTRODUCTION

South Africa is one of the most diverse countries in the world and it is regarded as a rainbow nation to describe the unity of various cultural, racial or ethnic groups in the country. It is also regarded as a rich repository of knowledge referred to as indigenous knowledge. Indigenous knowledge is the traditional, cultural and community knowledge produced and owned by local people in their specific communities and passed on from one generation to the next generation, through practice and oral channels (Govender et al., 2013). In addition, Ngulube (2002) describes indigenous knowledge as mainly tacit and derived from local experiments, innovations, creativity and experiences, embedded in the minds and activities of communities with long histories of close interaction. This knowledge serves as the basis for problem solving, communication, teaching and decision-making in the indigenous communities where it is embedded (Furutnani et al., 2018). Indigenous knowledge has also been the basis for agriculture, education, health care and the wide range of other activities that sustain a society and its environment in many parts of the world for many centuries (Senanayake, 2006). Indigenist thinkers have advocated for the recovery and promotion of indigenous knowledge systems as important in decolonizing indigenous nations and their relationships governments, whether

those strategies are applied to political systems, governance, health and wellness, education, or the environment (Churchill, 1996). This knowledge therefore needs to be safeguarded at all times and be decolonized for the benefit of indigenous communities (Sithole, 2007). Decolonization is recovery from colonial impact and restoration of indigenous people's identities, languages and experiences (Datta, 2018). In this manner, indigenous communities can disentangle themselves from the oppressive control of colonizing state government through policy and decolonized strategies (Simpson, 2004). Denzin et al. (2008) further described decolonization as a continuous process of anti-colonial struggle that honors indigenous approaches to knowing the world, recognizing indigenous land, indigenous peoples and indigenous sovereignty.

Decolonial thinking has been used to critique the colonial-modern function of assumptions and knowledge forms that are deeply embedded in the discipline and the broader field of Western social science (Seth, 2013). Smith (1999) defines decolonization as a process for conducting research with indigenous communities that places indigenous voices and epistemologies in the center of the research process. For example, interest in research on African indigenous vegetables by Agriculture Research Council (ARC) has been regarded as decolonization process. Smith (1999) suggests that the process of decolonization of indigenous research will help regain control over indigenous ways of knowing and being, and ways in which research can be used for social justice. However, apartheid regime together with colonialism had led to the subjugation and suppression of indigenous ways of life (Heleta, 2018), and this was because the colonialists considered indigenous knowledge system as backward and not worthy of any development when compared to other worldviews. There has also been a general disregard of indigenous knowledge system amongst academics and scientists, and as a result, the value of primary knowledge was strategically rejected among academics (Mji, 2019). Even indigenous researchers who were aware of the benefits and superiority of indigenous techniques remarked that they were afraid to admit an interest on this sphere of knowledge, basing this on fear of being ridiculed by Western peers (Mji, 2019). Researchers thus requires contextualized research processes that are relevant to the challenges of indigenous communities and contribute to their development, using acceptable indigenous research methods and theories. Indigenous decolonizing methods and theories suitable to our African contexts include decolonizing research methodologies, Ubuntu and Afrocentrism. Decolonizing research methodology is an approach that is used to challenge the Eurocentric research methods that undermine the local knowledge and experiences of the marginalized population groups (Smith, 1999). The Ubuntu concept expresses the African philosophy of humanness, that a person is a person through other people (Murithi, 2006). The Afrocentric is a philosophical and theoretical perspective that suggests cultural and social immersion as the best approach to understand African phenomena as opposed to scientific distance (Mkabela, 2005). Furthermore, Goduka, et al. (2013) argued that for research to be relevant and improve the quality of life of indigenous people, it needs to be rooted in indigenous worldviews, cultural values and languages.

It is therefore prudent for indigenous knowledge researchers to appropriately align the ways in which they engage with communities so that they are respectful of and responsive to sociocultural contexts. There is also a need to follow proper etiquette and protocol when dealing with the people concerned (Gupta, 2010). This article thus looked into initiatives being established in different parts of the world with the aim to protect indigenous knowledge for future generation while also reconciling the indigenous people for the years of loss and suffering. The article also provides the techniques through which this knowledge is shared within the indigenous communities themselves and the ways in which indigenous researchers attempted to share knowledge from research with participants for the benefit and acknowledgement of the research participants as indigenous knowledge holders or communities.

Problem Statement

It has been accorded in literature review that much research on indigenous knowledge has been carried out by researchers without decolonizing the research (Datta, 2018; Keane, Khupe & Seehawer, 2017). Indigenous scholars argue that Western research without decolonization can be referred to

as oppression towards indigenous communities (Kovach, 2010). Researchers rarely think about sharing their indigenous research with the indigenous knowledge owners and their communities. Lincoln (1994) explains Western research as the *rape* model of research where the researcher comes in, takes what he wants and leaves when he feels like it. Indigenous knowledge researchers should thus engage in research not only to produce knowledge but also to make positive change in the lives of those who participate in research. As noted by Louis (2007), if research does not benefit the communities by extending the quality of life for those in the communities, it should not be done. Knowledge outcomes can be shared in ways that benefit the community through consultations with research participants (Keane, Malcolm, & Rollnick, 2004). However, indigenous researchers in the African context have still not done enough to redress this travesty of conducting a research that is not benefitting the indigenous knowledge owners and their communities. Indigenous knowledge thus needs to be decolonized and be shared in ways that benefit indigenous owners and their communities (Sithole, 2007). The development of policy and support programmes provided by government in the protection of indigenous knowledge systems are also important in the field of previously suppressed indigenous knowledge system. The indigenous knowledge system policy needs to be well understood by indigenous communities. The article thus looked into policy and protocols aimed at protecting indigenous knowledge and its impact in decolonizing indigenous knowledge systems in South Africa. The research objectives formulated for this study were to:

- Examine international and national initiatives aimed at protecting indigenous knowledge;
- Establish the barriers to effective knowledge sharing among indigenous communities;
- Determine the techniques or strategies that are used for knowledge sharing to benefit indigenous knowledge owners and their communities; and
- Determine the impact of policy frameworks and protocols in the promotion and protection of indigenous knowledge for the benefit of indigenous holders and their communities.

The Impact of Colonialism on Indigenous Knowledge Systems

The history of colonialism is one of brutal subjugation of indigenous peoples and most of the African continent is still underdeveloped and recovering from colonization (Blakemore, 2019). Blakemore (2019) define colonialism as a control by one power over dependent area or people and it occurs when one nation subjugates another, conquering its population and exploiting it, often while forcing its own language and cultural values upon its people. Africa was rich in oil, copper, diamonds, gold and many other resources that made European nations blind and cruel to the African people and started to exploit them in the most violent ways possible. Europeans nations claimed that they are in Africa to boost local livelihood, whereas they are in Africa for monetary colonization and shipping resources for their own troubled economy. Many African countries including South Africa were compelled to import oil for their own use because their economies are narrowly tied to exports, and they are hit by higher oil prices. The forces of cultural genocide, colonization and colonial policy perpetuated over the last several centuries by successive occupying settler governments is responsible for the current state of indigenous knowledge systems (Simpson, 2004). The Natives Land Act (1913) reserved most of the land for white ownership, forcing many black farmers to work as wage labourers on land they had previously owned. Black land ownership was restricted to 13 percent of the country, and much of it heavily destroyed over time when the act was amended in 1936.

Colonialists regarded indigenous knowledge as primitive, uncivilized, backward, superstitious and savage (Briggs & Sharp, 2004), and this knowledge was viewed as irrelevant to development and an obstacle rather than a force of change. Sillitoe (2006) argues that the premise which was used to confirm the insignificance of indigenous knowledge was drawn from modernity and dependency models. Hobart (2002) explains dependency theory as anchored on exploiting resources and labour of the local people, creating inequalities among people.

However, Vázquez (2012) view coloniality as the darker side of modernity and this is because modernity can be seen to bring about democracy, globalization and liberalization. The impact of colonialism on indigenous knowledge systems include environmental degradation, economic instability, ethnic rivalries and human rights violations issues that can outlast one group's colonial rule (Blakemore, 2019). Colonialism is therefore the current threats to indigenous communities and their land, and it continues advancing the oppression of the world's indigenous nations. Morgan (2003) further observed that as indigenous knowledge was suppressed, the western system also allowed appropriation and exploitation of this knowledge for the benefit of the colonizers. Briggs (2005) also observed that the integration of indigenous knowledge into the education system that is dominated by the western worldview occupy a lesser position to the other. This is because indigenous knowledge has to meet the standards set by science to be accepted. The education system continues to favour western knowledge over indigenous knowledge (Wilson, 2004). Morgan (2003) concurs that western worldviews are still dominant in higher education and this is despite efforts by various groups to push for the recognition of indigenous knowledge in such institutions. Morgan (2003) thus emphasized that those who were once colonized should initiate the decolonization, a process that allows the revaluing and recovering of the lost.

CONCEPTUAL FRAMEWORK

Drawing from Ngulube (2018), the conceptual framework was derived from various components of theories, models and concepts embedded in the extant literature. Decolonial theory and knowledge ontology and modelling framework have been adopted to guide this study.

Decolonial Theory

The study is grounded in decolonial theory in an attempt to promote and protect indigenous knowledge, by countering the colonial forces that seek to displace this knowledge. Decolonial theory was found suitable for its ability to diagnose the problem of colonization and aims to situate the course within the episteme of indigenous philosophy. This theory was thus used as an underpinning philosophy and it allowed for the examination of epistemological inequalities that were created because of colonialism and apartheid in South Africa. Decolonial theory does not refer to a single theoretical school, but rather points to a family of diverse positions that share a view of coloniality as a fundamental problem in the modern as well as post-modern and information age (Maldonado-Torres, 2011). As observed by Tlostanova and Mignolo (2009) colonial systems seem to be beneficial to all, yet they are the cause of cheap labour, overexploitation of resources, suppression and exclusion of all that is found outside of reality as articulated by the global powers such as Europe and the United States of America. African people acquired a bruised cultural identity, a philosophy of the oppressed and that corrupted their thinking and sensibilities through contact with the West (Shizha, 2005).

As noted by Maldonado-Torres (2007), coloniality is continuing to exist in education, economy, culture and people 's image when western ideologies continue to dominate worldviews. For example, colonial languages such as English still have a powerful position and it is dominating the space in most African countries as it has been regarded as a privileged language. The effect of this perception has seen some black parents resorting to taking their children to English Medium schools and most of the children who speak African languages at home switch to English as their primary language. This example serves to show that some people still believe that white people are superior hence they aspire for a white man's language. Decolonial theory rejects modernity, which is located in the oppressed and exploited side of the colonial difference, in favour of decolonial liberation struggle for a world beyond Eurocentred modernity (Ramon, 2011). Ndlovu-Gatsheni (2013) described decoloniality as an epistemic project seeking liberation and freedom for the people who experienced colonialism and living under the boulder of global coloniality. As noted by Ndlovu-Gatsheni (2013), the core of decoloniality is the agenda of shifting the geography and biography of knowledge to native people who

have the potential and knowledge to address their own vulnerabilities. Decolonial theory evokes the need to revalue and rework local epistemologies that have been rendered insignificant and unscientific by the West (Ndlovu-Gatsheni, 2013). Decoloniality thus recover indigenous knowledge on the contemporary ground and give shape to new knowledge production for indigenous social practices, such as health, education and governance (Nakata, Keech & Bolt, 2012). As a result, the indigenous people can move towards applying local knowledge to achieve sustainable development and reclaim their identity in the knowledge space through decoloniality.

Knowledge Ontology and Modelling Framework

Several scholars such as Nonaka and Takeuchi (1995), Earl (2001) and Wiig (1993), to mention but a few, have developed theories, models and frameworks which helps guiding knowledge managers throughout the process of knowledge management. This study adopted knowledge ontology and modelling framework by Haron and Hamiz (2014). The importance to develop an ontological model is to share a common understanding and sensible structures of information, to make domain hypothesis explicit, to provide categorization structure and to enable reuse of domain knowledge (Haron & Hamiz, 2014). The ontology is an example of knowledge modelling which represent the knowledge in a manner which a computer can facilitate (Vassev, Hinchey & Gaudin, 2012). The application of knowledge ontology and modelling framework will also develop a clear path pertaining the adoption of knowledge management systems in support of knowledge management and sharing. As pointed out by Almeida and Barbosa (2009) a declarative approach to ontology is thus needed for the knowledge preservation because ontology is a method where the domain is represented in a structured manner and may provide the benefits to those who implemented it. One of the most important purposes of knowledge management is to systematically influence knowledge exchange, application and creation, thereby creating value (Kozhakhmet & Nazri, 2017). The role of ontology in knowledge management processes aids in knowledge creation, acquisition, storage, transfer and application together with performance improvement (Sassson & Douglas, 2006; Haron & Hamiz, 2014).

Knowledge Creation

Von Krogh, Nonaka and Rechsteiner (2012) describe the creation of knowledge as an ongoing procedure by which knowledge comes into existence through cooperation or individual effort and is refined and enhanced within a corporate system. Grimsdottir and Edvardsson (2018) stated that new knowledge is frequently created or engendered by innovative concepts or urgent needs, either arising within the organization itself or emanating from external market pressures. Knowledge creation process thus evaluates the stages of producing innovative knowledge, such as the application of figurative terms in which to render external knowledge (Grimsdottir & Edvardsson, 2018). Knowledge can also be created through education, interaction, practice and collaboration as the different types of knowledge are shared and converted, as noted by Frost (2010). The development of a software product is an example of knowledge creation (Wan, et al., 2010). Nonaka and Takeuchi (1995) identified the following knowledge creation processes, namely: socialization in which knowledge is passed on through practice, guidance, imitation and observation. Externalization in which tacit knowledge is codified into documents, manuals, etc. so that it can spread more easily through the organization. Combination mode is a situation whereby codified knowledge sources (e.g. documents) are combined to create new knowledge. Internalization that implies that knowledge is internalized, modifying the user's existing tacit knowledge.

Knowledge Acquisition

Dalkir (2005) defines knowledge acquisition as the stage at which knowledge is contextualised in order to be understood. It is the process of accepting knowledge from external sources for the purpose of using it in the organization (Pacharapha & Ractham, 2012). This process is achieved by extracting, interpreting and transferring knowledge to improve existing organizational knowledge. As noted by

Shongwe (2016) an acquisition process thus involves access, gathering, location and capturing of knowledge from suppliers, participants, employers and other knowledge sources. Knowledge can also be acquired from repositories, learning from others and learning from experiences.

Knowledge Storage

Knowledge storage refers to the existence and identification of information in the database of the company (Shongwe, 2016). It is the codification of existing knowledge and know-how into organizational memory (Dalkir, 2005). It is therefore necessary to store knowledge in a safe place, for future purposes since knowers take their knowledge with them when they withdraw from the organization. However, knowledge may be lost more particularly if it is tacit and it is not properly managed or preserved. Shongwe (2016) added that knowledge can be carried digitally or be stored manually in minutes of meetings, reports, policies and many other physical organisational documents while electronically can be stored in organisational databases, portals and emails.

Knowledge Transfer

Gaura, Hongjia and Baoshan (2019) define knowledge transfer as the design and transmission of knowledge within an organization or between organizations to enhance learning and productivity of workers, which is essential in the overall success of the organization. It is the process in which knowledge is shared or communicated to other individuals or groups within the organisations through workshops, seminars, conferences, classrooms, meetings, face-to-face interactions or the use of technology (conferencing software, emails) (Likalu, et al., 2010). Sagsan (2009) stated that knowledge transfer requires the prerequisites of knowledge sharing mechanisms that allow teams, departments and groups to share their tacit and explicit knowledge through technological and social communication infrastructure channels. Social communication means informal working settings and it helps in transferring tacit to tacit knowledge while technological communication infrastructure is useful for structuring data and transferring knowledge timely (Sagsan, 2009). Choo and de Alvarenga Neto (2010) identified four sets of knowledge sharing enablers, namely:

- **Social/Behavioural:** Includes social relationships and interactions based on norms and values such as trust, care, empathy, attentive enquiry and tolerance.
- **Cognitive/Epistemic:** Includes the need for both epistemic diversity and common knowledge or shared epistemic practices and commitments.
- **Information Systems/Management:** The use of information systems and Information and communication technologies such as social networks that enable knowledge sharing and information management processes to support knowledge activities.
- **Strategy/ Structure:** The need for the organization and its management to provide direction and structure.

However, effective knowledge transfer may not be complete without the use of knowledge. Knowledge transfer thus involves donation and collection of knowledge, and it is possible that donated knowledge that is not put into proper use may not yield any positive benefit (Adeyemi, Uzamot & Modupe, 2022). Knowledge managers thus need to develop strategies for effective knowledge transfer that will aid efficient knowledge use.

Knowledge Application

Knowledge application refers to the actual use of knowledge that has been captured and stored in organisational databases or the knowledge in people's heads (Shongwe, 2016). Knowledge application can help to transform knowledge from being a potential power tool into actual innovations or inventions, which can enhance overall performance of organizations (Matin *et al.*, 2013). Knowledge use is

basically important to knowledge recipient who employ knowledge for innovation and consequently improves organizational performance (Carvalho & Gomes, 2017). Gottschalk (2007) also emphasizes the necessity of using knowledge in organizational practices, processes and policies. Knowledge application is when available knowledge is used for decision making, problem solving and perform tasks through direction and routines (Becerra-Fernandez & Sabherwal, 2010). Direction refers to the process through which the individual possessing the knowledge directs the action of another individual without transferring to that individual the knowledge underlying the direction (Becerra-Fernandez & Sabherwal, 2010). Routines involve the utilization of knowledge embedded in procedures, rules, norms and processes that guide future behaviour.

RESEARCH METHODOLOGY

The article critically reviewed literature in order to analyze the policy and protocols in the promotion and protection of indigenous knowledge systems, as a way of decolonizing these systems, using qualitative content analysis. Although content analysis has served mostly as a complement to other research methods, it has also been used as a stand-alone method and there are some specialised forms of qualitative research that rely solely on the analysis of content. The study by Boamah and Liew (2017) on conceptualizing the digitization and preservation of indigenous knowledge was also based on content analysis. Qualitative content analysis method is defined as the systematic reduction of content, analysed with special attention to the context in which it was created, to identify themes and extract meaningful interpretations of the data (Roller & Lavrakas, 2015). Content analysis is suitable for analysing various qualitative and unstructured data such as those collected during unstructured or semi-structured interviews or web-based documentary research. Like other analytical methods in qualitative research, content analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding and develop empirical knowledge (Corbin & Strauss, 2008). According to Ngulube (2017) conducting a literature review can also assist to develop a conceptual definition of a construct on the basis of shared meaning, describe what theory or theories were used to explain relationships among concepts and establish how the concepts have been measured in an empirical investigation. Addressing these questions may enable researchers to develop a conceptual system and check the coherence between the conceptual or theoretical framework and various elements of the research design (Ngulube, 2017). The study also reviewed models, theories and frameworks pertaining to indigenous knowledge and decolonization of this knowledge. The analytic procedure thus entails finding, selecting, appraising or making sense of and synthesising data contained in documents. For this current study, content analysis was introduced and applied for reviewing literature reviews on journals articles reporting on previous studies in decolonization of indigenous knowledge systems, following the guidelines advanced by Kitchenham (2004). The review protocol was composed of the following elements:

- Inclusion/Exclusion Criteria

The inclusion criteria aim to identify studies that provide direct evidence about the research question (Kitchenham, 2004). The review process thus begun with the researcher identifying and selecting documents on the basis of their usefulness and relevance to the study. The study reviewed literature and the empirical studies reporting on previous studies in decolonization of indigenous knowledge systems, international initiatives in promoting and protecting indigenous knowledge, knowledge sharing strategies, barriers to effective knowledge sharing and the impact of policy and protocols in protecting indigenous systems, whether positive or negative, to address research objectives of the study. Literature review on knowledge management and digital preservation of indigenous knowledge, in major databases such as ScienceDirect, Wiley, Springer, Sage and Google Scholar were conducted to ensure inclusion of all relevant studies in the literature review or content analysis.

However, only journal articles were included in the literature review, and the editorials and book reviews were excluded in this study as they do not include original research. Peer-reviewed journal articles represent a major mode of communication among researchers and they are therefore taken as unit of analysis.

- Search Strategy

The following search terms were used: decolonization of indigenous knowledge systems, initiatives in promoting and protecting indigenous knowledge, benefits of knowledge sharing, knowledge sharing strategies, barriers to effective knowledge sharing, implications of policy and protocols in protecting indigenous knowledge, to find published articles reporting on decolonizing indigenous knowledge systems. The search terms were used to collect data from related studies from EBSCOhost, Emerald, Springer Wiley and Scopus, databases that provides access to publications in a variety of fields. Databases such as EBSCOhost allows using complex search strings and filters which makes it easy to apply complex selection criteria and it is therefore, considered a suitable choice for systematic literature reviews (Wang & Noe, 2010). The study also made a more focused search on digital preservation of indigenous knowledge as it was regarded as a decolonial strategy.

- Study Selection

Researcher read the title and the abstract of generated articles and removed all the duplicates, which considerably reduced the sample size. The selection criteria include: the study must be empirical, published in a peer-reviewed journal and focused on decolonization of indigenous knowledge systems. Although many articles related to the study were generated, however some of the articles were removed after thorough reading of all the articles, mainly because of their irrelevance to the topic of interest and research objectives or lack of quality.

- Data Analysis and Synthesis

The thematic analysis technique or process developed by Braun and Clarke (2006) was used to systematically analyse the qualitative data or text extracted directly from previous studies on decolonization of indigenous knowledge systems and the impact of policy and protocols in decolonizing these systems. The process of thematic analysis is outlined below:

- **Familiarization with the data:** It was developed by reading the papers selected for review using the "repeated reading" approach to search for meanings and patterns. To remove any ambiguity, the extracted data were connected to the source paper to develop contextual understanding helpful in data interpretation.
- **Generating initial codes and themes:** The coding process was research objectives driven, i.e. codes were developed through capturing aspects of indigenous knowledge systems, knowledge sharing strategies and the impact of policy and protocols, under investigation, which made it easier to assign relevant code. After the completion of the coding process, all codes were reviewed and collated to generate potential themes relevant to the research objectives.
- **Reviewing themes:** All of the themes were defined and common characteristics in the themes were outlined, as per the objectives of this study, and this led to the development of higher-level themes composed of many sub-themes. For example, the decolonization of indigenous knowledge was a common thread connecting different themes, which led to the development of main themes, for example, initiatives in promoting and protecting indigenous knowledge,

knowledge sharing strategies, knowledge sharing barriers and the impact of policy and protocols in protecting indigenous systems.

- **Producing the written analysis:** The analysis process resulted in the identification of decolonization of indigenous knowledge and impact of policy and protocols explored in previous studies and the potential research gaps needing further investigation.

International Initiatives to Promote and Protect Indigenous Knowledge

Considerable efforts have been made globally, over the past few years to promote and protect indigenous knowledge for the benefit of indigenous owners and their communities. Many of these initiatives were aimed at providing the necessary infrastructure and strengthening capacity for safeguarding indigenous knowledge in African countries. The United Nations (UN) (1992) formed a Convention on Biodiversity (CBD) that provides for recognition and protection of indigenous knowledge, and it state that each contracting party be subjected to its national legislation and encourage the equitable practices. It also adopted the UN Declaration of Rights of Indigenous Persons acknowledging the importance and the need to respect and promote the rights and knowledge of indigenous communities (UN, 2007). United Nations Environment Programme (UNEP), which is the custodian of the Convention on Biological Biodiversity (CBD), has requested World Intellectual Property Organization (WIPO) and World Trade Organization (WTO) to consider protection and benefiting of local communities that have contributed to an invention or intellectual property development (Gorjestani, 2000).

WIPO (2002) has established an Intergovernmental Committee (IGC) to initiate discussion on the protection of traditional knowledge, genetic and biological resources and folklore, and a sui generis system for the protection of indigenous knowledge in order to address the preservation challenges, using intellectual property systems. United Nations Educational, Scientific and Cultural Organization (UNESCO) (2003) formulated the Convention on the Protection of the Diversity of Cultural Contents and Artistic Expressions, and article 27(3)(b) of Intellectual Property Rights (TRIPS) aimed at empowering member states to consider protection of traditional knowledge using intellectual property systems. The International Federation of Libraries Association (IFLA) (2015) stressed its support for the UNESCO Vancouver Declaration of the libraries' role of providing access and safeguarding of heritage resources.

African Initiatives to Promote and Protect Indigenous Knowledge

The African Department of the World Bank (1998) launched the Indigenous Knowledge (IK) for Development program in partnership with over a dozen organizations. This program has developed a number of instruments and services for the capture, dissemination and application of indigenous knowledge practices. These include: the creation of indigenous database of over 200 indigenous practices, a monthly publication called IK Notes, appearing in two international languages (English and French) and two local languages (Wolof, Swahili), with over 20,000 readers and a multilingual website (Gorjestani, 2000). The program has also helped indigenous knowledge resource centres in other countries to improve their national and regional networking capacity. For example, Uganda received advisory and financial support to help draft a national strategy for the integration of indigenous knowledge into its national Poverty Eradication Action Program and grant funding to build capacity for the implementation of the strategy (Gorjestani, 2000). Several efforts have been made to support national strategies in countries such as Uganda, Malawi, Tanzania, Cameroon and South Africa to mainstream indigenous knowledge, supported by the World Bank program. These African countries have undertaken various activities to build on indigenous knowledge in agriculture, healthcare, and education with the assistance of the indigenous knowledge program. For example, the Agricultural Research and Training Project (ARTP II) in Uganda explored the use of indigenous knowledge in agriculture and a team interviewed communities and farmers in the Ugandan National Agricultural

Advisory Services program, to devise a performance monitoring system based on indigenous knowledge indicators (Gorjestani, 2000).

In Malawi, indigenous knowledge of farmers and fishermen are merged with scientific knowledge to improve the sustainable use of the Lake Malawi Basin resources. Other countries like Ghana, Kenya and Ethiopia also initiated projects to promote medicinal plants as an integral part of health-related indigenous knowledge to provide alternative sources of income, to maintain and protect biodiversity. A global network of indigenous knowledge resource centres has emerged in Tanzania, over the last ten years and its members include academic institutions, Non-Government Organizations (NGOs) and researchers engaged in documentation, dissemination and advocacy of indigenous knowledge (Gorsjestani, 2000). In Cameroon, the US National Cancer Institute reportedly signed a contract with the government following the discovery of a forest plant species with a potential anti-AIDS chemical. Traditional healers in Pangani district in Tanzania have treated over 2000 HIV/AIDS patients, using medicinal plants. The Uganda National Council for Science and Technology (UNCST) (1999) initiated a study to explore the potential of utilizing indigenous knowledge in the agriculture and health sectors. This was the basis for a national workshop involving policy makers, scientists, development practitioners and NGO representatives, traditional healers and farmers to draft a national strategy and framework for action (Gorjestani, 2000). The government of South Africa has also recognised a need to protect and preserve indigenous knowledge and enacted a policy which protect indigenous knowledge systems. Indigenous knowledge system policy identified various means of protecting indigenous knowledge in the South African context, and these include: the intellectual property system, databases, sui generis laws and registers (Department of Science and Technology, 2004).

The Department of Trade and Industry (2005) further initiated the Patents Amendment Act, 2005 that is being used at the WTO and WIPO as legislation model, and therefore if indigenous knowledge is used in securing patents, protection and befitting of the local communities may take place under the law of patents. Geographical indications may be used to protect and commercialised names of both plants and animals that are peculiar to geographic areas, e.g. Nguni cattle (Gorjestani, 2000). Traditional healers may use the laws of patents to protect and commercialise their traditional knowledge. The Department of Science and Technology (DST) (2011) in South Africa established Bio-Innovation programme aimed at mainstreaming indigenous knowledge-based concepts within the national system of innovation and facilitating community-based technology transfer. The programme is supported by an Indigenous Knowledge Systems (IKS) Bill, a legal framework that ensures that collaboration between researchers, industry and communities is protected by law for the benefit of all parties. The programme is already engaged in multiple projects including the University of KwaZulu-Natal, in partnership with the Makonde Indigenous Fruit Processing Association (MIFPA) that conducted the study on the use of marula formulations in the treatment of diabetes that has been used as medicine by communities in parts of KwaZulu-Natal, Limpopo and Mpumalanga for centuries. The National Research Foundation (NRF) (2012) is also supporting research projects through allocating funds specifically for indigenous knowledge systems in the field of technology, health and food security. All these initiatives serve as evidence that both national and international organizations have so far put efforts to protect indigenous knowledge.

The Barriers to Effective Knowledge Sharing Within Indigenous Communities

A critical analysis of why indigenous knowledge is becoming lost rarely moves beyond the assertion that the elders are dying or the assumption that indigenous knowledge systems are more vulnerable than Western systems simply because they are oral in nature (Simpson, 2004). One of the main reasons why indigenous knowledge has become threatened lie embedded in the crux of the colonial infrastructure. This infrastructure will continue to undermine efforts to strengthen indigenous knowledge systems and to harm the agenda of decolonization and self-determination, unless it is properly dismantled and accounted for (Simpson, 2004). Msuya (2007) emphasized that indigenous knowledge benefits

be returned to knowledge owners and suggests measures that can be taken to alleviate the challenges including developing appropriate indigenous knowledge policies and practices.

Indigenous knowledge is tacit knowledge that people should be willing to verbalize and share, however, indigenous people are not always willing to share this knowledge with people from outside their communities (Msuya, 2007). As stated by Wenger, et al. (2002), transfer of knowledge across cultural boundaries also creates additional challenges for collaborative learning in multi-national and global organizations. The common ways of sharing knowledge such as the transfer of knowledge from the sender to the recipient are also based on an old-fashioned transmission model (Savolainen, 2017). Lack of awareness about the historical value and significance of digital documentary heritage among policy makers has also been taken for granted for far too long. Culture is also one of the major barriers to knowledge sharing, and therefore knowledge sharing fails in organizations because they tend to change the culture of their organizations to suit the knowledge sharing strategies (Jain et al., 2007).

Nadason, et al (2017) highlighted individual barriers to knowledge sharing such as fear, lack of time, low level of awareness, lack of interpersonal skills, difference in level of experience, poor communication, education, gender and age differences. Nadason et al. (2017) also identified organizational barriers such as lack or no rewards, organizational culture, infrastructure shortage, lack of organizational resources and communications, lack of technical support, lack of integration of the Information and Communication Technology (ICT) system, unwillingness to implement the ICT system and lack of knowledge management system training. Lashgarara, et al. (2011) also identified the absence of training on the use of knowledge management systems as a large problem to the states. Lwoga, Ngulube and Stilwell (2011) identified other barriers that hinder sharing of indigenous knowledge including selfishness, occurrence of conflicts within families, use of conventional technologies and techniques undermining knowledge sharing and some indigenous knowledge holders requiring payment to share their knowledge. Other challenges to effective knowledge sharing include insufficient funding, complexity of ownership protocols, loss or misappropriation of digitized indigenous knowledge, lack or limited skills, inadequate infrastructure, protection of intellectual property rights and unreliability of the preservation media (Akinwale, 2012; Sithole, 2007). The traditional medicinal knowledge is also practiced in secrecy. This knowledge is only shared by the senior traditional medicinal knowledge owners with many years of experience where they stay with trainees until the duration of their training (Khumalo et al., 2018).

A study by Wanakwakwa et al. (2013) on traditional medicinal knowledge indicated that indigenous knowledge owners preferred keeping secrecy of their knowledge and any attempts made towards invasion of secrecy was fined to prevent efforts to stealing this knowledge. The mode of transference is in verbal form and this knowledge thus needs to be captured, documented and preserved for future use. However, the owners of this knowledge are generally reluctant to have their knowledge and skills documented and to share their drug sources, materials, methods and implementation procedures with the general public. Therefore, this makes close family members to be the one who imbibe this knowledge from its owners before they perish or die (Anyaoku et al., 2015). Anti-colonial strategies for the recovery and sharing of indigenous knowledge systems and a critical analysis of colonialism are thus required.

Strategies for Sharing Indigenous Knowledge

Wenger, McDermott and Snyder (2002) described the relation of culture as often seen in the relationship between shared practices, knowledge sharing and shared identity development. Knowledge sharing is the ability to transfer framed experiences, information, and expert insights into practices (Wiewiora, Trigunarsyah, Murphy & Coffey, 2013). It is the process of transference of experience and organizational knowledge to business processes through communication channels between individuals (Oyemomi, Neaga & Alkhuraiji, 2016). Indigenous knowledge is communicated orally and can thus be shared through the use of traditional techniques or methods such as oral traditions, community of practices, storytelling, etc.

Oral Tradition

Oral tradition is collections and the living memories of the past that have been orally transmitted, recounted and shared throughout culture (Kargbo, 2008). Oral traditions may speak of a particular family, lineage, language, or region, or serve as markers of distinct indigenous identities. In order to qualify as oral traditions, these traditions comprise varied cultural heritage practices and resource transmitted over generations by means of observation and word of mouth (Biyela, 2016). The information is typically passed on through acts of story-telling, speech or song that are both literal and metaphorical, as they verbally reconstruct connections with the past (Johnson, 2007). As observed by Bruchac (2014), indigenous peoples may combine the narration of these traditions with other activities such as ritual practice, music, art, rock carvings, mock combat, that ritually re-enact or engage with ancestral beings or other creatures.

Oral traditions, whether communicated as historical narratives or mythical stories, constitute a form of traditional knowledge that can teach, carry and reinforce other knowledges (Bruchac, 2014). Wilson (2015) described oral traditions as historical sources of social nature derived from the fact that they are not written and the sharing depends on the power of the memory of successive generation of human beings. It is a technique of sharing indigenous knowledge which plays a role in facilitating better understanding of one's history and background, and to inform others about their culture (Babatunde, 2015). These traditions can also include supernatural data, stories of encounters between human and non-human beings in the distant past, messages delivered by animal intelligences, spiritual visions and transformations (Cajete, 2000). Some of the most ancient oral traditions record the actions of other-than-human beings who moved glaciers, rivers and rocks, actively sculpting the Indigenous homeland (Bruchac, 2014). Oral traditions can have both practical and ritual aspects. On a practical level, indigenous peoples have developed technologies that enable successful hunting and gathering while ritual activities provide a means of communicating with elemental spirits and worldly beings that have intelligences of their own (Apffel-Marglin, 2011). From the colonial era to the present, oral traditions have also been employed as a means of identification and a form of resistance to colonial domination (Vizenor, 2008).

Community of Practice

Communities of Practice (CoP) or communal meetings are popular in recent years, as a means of managing the human and social aspects of creating and disseminating information in organizations, and they are increasingly being looked at in sharing knowledge (Ardichvili, et al. 2003). Community of Practice (CoP) is a group of people who share a concern, a set of problems or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Canadian International Development Agency, 2003). Ngulube and Mngadi (2009) further described a community of practice as a group of people who work together in a responsible way to share ideas. Wenger, McDermott and Snyder (2002) believe that CoP groups are the most versatile and dynamic sources of knowledge in an organization. CoP is created by people who engage in a process of collective learning in a shared domain of human endeavour such as a tribe learning to survive, a band of musicians trying to find new forms of expression, a group of defining their identity in school etc (Wanger, 2011).

Creating CoP is a way to share knowledge and experiences with others who are passionate about the same topic and in return, all members learn from others. CoP members freely discuss the various situations they face, their aspirations and they develop a unique action-oriented perspective and context-specific common practice (Canadian International Development Agency, 2003). CoP is a vital component of a learning organization and all members of the community thus benefit from participation in community of practice as they become part of the collective process of learning and share knowledge practices. CoPs can be virtual or physical and are tailored to members' needs. CoP members manage their tacit and explicit knowledge in a given field as effectively as they can and these meetings allow members to generate new knowledge in response to specific problems and issues, share

specialized knowledge and to test new ideas (Canadian International Development Agency, 2003). However, as noted by Biyela (2016), this practice was disappearing due to reasons such as lack of resources, lack of commitment and cooperation and low level of education, although the sharing of knowledge through communal meetings has been practiced by communities for a long period of time.

Digital Preservation of Indigenous Knowledge as Decolonial Strategy

Indigenous knowledge is regarded as undocumented knowledge that exists in the minds of community people which is passed from one generation to the other through word of mouth (Ebijuwa, 2015). This suggests the importance of preserving it for fear of being lost. However, the successful transmission of indigenous knowledge is dependent on the elders of community's capability to pass on the knowledge before the full richness of the stories diminishes. Community elders must thus be respected and valued for knowledge gained from sharing their stories. The number of community elders and indigenous knowledge holders who have a considerable amount of indigenous knowledge is however diminishing as they pass away and this has become a concern to indigenous peoples and academics alike. Adeniyi (2013) also noted that African indigenous knowledge is poorly managed and some ideas vanish once the custodians die. There is a growing need to preserve indigenous knowledge, as indigenous communities around the world face ongoing threats to the survival of their traditional languages and cultures (Stevens, 2008). A concern over the loss of indigenous knowledge due to colonization and globalization, and that indigenous communities may lose control and rights over their knowledge has also raised a need in preserving this knowledge in digital formats. Several proponents have argued that if indigenous knowledge is not digitized and preserved, it will become unavailable for generations to come (Biyela, 2016; Oyelude & Haumba, 2016). It is therefore important to preserve indigenous knowledge as it can be shared with others and be passed on to upcoming generations.

The availability of digital technology has greatly expanded possibilities for digitization and preservation of indigenous knowledge. More recently, cultural heritage institutions (libraries, archives and museums) in African countries such as South Africa, Uganda, Nigeria and Ghana are taking advantage of digital technologies, to digitise and preserve heritage resources to create national repositories (Biyela, 2016). A digital heritage management system, South African Heritage Resources Information System (SAHRIS) which integrates the processes of recording moveable (objects) and immoveable (sites) heritage resources with their management, was also developed, as mandated by the National Heritage Resources Act (NHRA) (SAHRA, 2012). The National Digital Heritage Archive (NDHA) in New Zealand, American Memory and the Australian Digital Collections are other examples of national digital memory projects that have been developed through collaborations with people from source communities and key stakeholders. However, as noted by Tobin (2004), there is a misperception in some indigenous communities that recording knowledge in registers and databases is a means of asserting rights of ownership over the knowledge. Tobin (2004) argued that placing the knowledge in a publicly accessible database can enhance its accessibility for bio-prospectors while giving little benefit to the holders of the knowledge. Documentation and preservation of indigenous knowledge must thus be part of a legislative system that recognizes rights over this knowledge. Proper knowledge management policy and procedures thus need to be implemented in the preservation of indigenous knowledge (Kaniki & Mphahlele, 2002). Sithole (2007) described preservation as an acceptable way to validate and grant indigenous knowledge protection from bio piracy and other forms of abuse, and help to ensure that communities are not disadvantaged because of the unique beliefs and folkways that pattern their lives. Bio piracy is a practice in which a community's indigenous knowledge is plundered by outsiders for profit. Dewi and Susetyo-Salim (2017) described preserving knowledge as an effort of conserving knowledge that people have in order to not lose it. Yadav (2013) identified various reasons for preserving indigenous knowledge as to assist in the conservation of the environment, to prevent bio piracy, to benefit national economy and to improve the livelihoods of indigenous knowledge owners and their communities. Digital preservation has thus become a popular method for assisting in the recovery and protection of indigenous knowledge. Some indigenous

communities have perceived the need to preserve their knowledge as a means to assert ownership over it and protect it from illegal commercial use or unauthorized use.

Twarog and Kapoor (2004) noted the potential benefit of making indigenous knowledge accessible in a digital format as to make it more appealing to youth or others who may see this knowledge as 'old-fashioned'. Therefore, documenting and preserving indigenous knowledge in an accessible format increases the likelihood of considering the indigenous knowledge owners' rights and perspectives in policy development and resource management. In addition, there can be economic benefits for indigenous communities who preserve their knowledge and possibly sharing it for commercial use. For example, some indigenous communities may wish to preserve indigenous knowledge related to plants so that pharmaceutical companies that use these plants for product development will recognize prior the use by these communities and benefit them accordingly (Stevens, 2008). Preservation of indigenous knowledge ranges from written materials such as reports, manuscripts, field notes, and media formats such as audio and video recordings, films, photographs, illustrations, paintings and three-dimensional artefacts. Cultural heritage institutions such as libraries, museums and archives can act as repositories of indigenous knowledge to ensure that it is accessible and usable to benefit indigenous knowledge owners and their communities. These institutions can thus assist in the collection, preservation of indigenous knowledge by publicizing its value, raising awareness on the protection of indigenous knowledge, involving elders and communities in the production of indigenous knowledge and encouraging the recognition of intellectual property laws to ensure the proper protection (IFLA, 2015). Durst and Wilhelm (2012) acknowledge that the libraries have played a major role in South Africa's national life and in the fight for democratic freedom through political and cultural impacts. Some of these institutions have adopted the Virtual Communities of Practice (VCoP) and social networks as the tools for managing and sharing knowledge amongst the employees and other stakeholders. A number of indigenous knowledge policy frameworks and initiatives have also been put in place by these institutions for safeguarding indigenous knowledge systems. Some of the indigenous knowledge systems digitization projects implemented in different parts of the world include the Traditional Knowledge Digital Library in India, Native Web in the Unites States of America (Chikonzo, 2006). Academic institutions in South Africa established Indigenous Knowledge Systems Documentation Centers (IKSDCs) to facilitate the digitization of indigenous knowledge systems. The Department of Arts and Culture (DAC) in South Africa also formulated a National Policy on Digitization of Heritage Resources that explicitly mentions community rights for indigenous and acts as a guideline for the digitization of heritage materials (Biyela, 2016).

Cultural heritage institutions in South Africa should therefore continue building consultation and collaborative networks with various indigenous stakeholders in order to improve best practices. Collaborative efforts and networks would also enable the establishment of a database that will provide access to different types of users governed by rights of access to indigenous knowledge. Cultural heritage institutions should also recognize their influence as socio cultural agents and actively work with indigenous communities in protecting and preserving indigenous knowledge. These institutions also need to develop knowledge management systems and provide their patrons with high-quality information in a reasonable time.

The Impact of Policy and Protocols in Decolonizing Indigenous Knowledge Systems

Decolonizing research should be centred on indigenous value, policy and indigenous protocols. Theories, policy, protocols and initiatives for the protection of indigenous knowledge were thus reviewed in this article. The review of these policies and protocols helped in understanding whether indigenous knowledge policy support indigenous knowledge practices. The government of South Africa has countered bio-piracy of indigenous knowledge and resources by passing laws which protect indigenous knowledge systems (Masango, 2010). The government has also fulfilled its commitment in the health sector by acknowledging traditional healers and medicinal plants through integrating

indigenous knowledge systems into health policy (South Africa, 2008a). It has been using indigenous knowledge system such as biotechnology to develop and improve indigenous natural resources for the socio-economic development of South Africa (South Africa, 2012). Several departments such as the Department of Science and Technology (DST) (2004) approached the cabinet in pursuit of formulation of an indigenous knowledge policy. The Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019 has been promulgated in South Africa to protect the indigenous knowledge from unauthorised use and misappropriation, to regulate the equitable distribution of the benefits of the use of indigenous knowledge and to provide for the documentation of indigenous knowledge.

The Department of Trade and Industry (DTI) (2010) developed national intellectual property policy which explains how indigenous knowledge can be protected through the use of patents, trademarks, designs and copyrights. DST (2013) established the National Indigenous Knowledge Systems Office (NIKSO) aimed at protecting intellectual property rights of indigenous communities and ensure equitable sharing of resources. Although protocols for handling indigenous knowledge help to uphold its interests by developing standards for ethical professional practice, however, they do not provide legal protection for indigenous communities nor do they provide any legal framework for those who want their cultural and intellectual property rights protected. Therefore, developing standards for ethical professional practice among indigenous communities is about managing risks associated with breaches of intellectual property rights. DST (2013) developed the National Recordal System (NRS) aimed at recording indigenous knowledge and bridge the chasm between indigenous knowledge systems production and other Western knowledge systems.

Based on content analysis undertaken by this study, intellectual property systems in South Africa are not entirely compatible with the nature of indigenous knowledge and do not provide effective protection to indigenous knowledge. Much of the indigenous materials in cultural heritage institutions in South Africa remains subject to relevant copyright laws. In many cases, the institution is the owner of copyright, in others copyright is owned by the individuals or entities which created the particular work or material (Andrzejewski, 2010). Most knowledge in developing countries is thus not legally protected and this leaves much of indigenous knowledge in developing countries open to bio-piracy and other forms of misappropriation (Msuya, 2007). The indigenous knowledge is thus used without the consent of the indigenous people, who are also given no acknowledgement for their work. For example, the hoodia plant has been patented for medicinal purposes and there was no recognition or compensation given to the indigenous Kalahari community that shared this knowledge with the global world, and this is a clear example of bio piracy (Msuya, 2007). Some of the developing countries have proposed that before patents are awarded to applications relating to indigenous knowledge, the country of origin and indigenous knowledge used in the invention must be disclosed, and proof of prior informed consent obtained through relevant authorities in the country of origin be provided (Ndinda, 2011). It is also suggested that a sui generis approach be adopted implying that adding information to the database automatically constitutes establishing a legal claim over it. Sui generis is the preferred method for effectively protecting indigenous knowledge and it has been favoured by international organizations. There are two forms of sui generis systems to be used in protecting indigenous knowledge namely, positive protection and defensive protection (World Intellectual Property Organization) (WIPO, 2002). Positive protection consists of declaring the rights of indigenous knowledge holders and indigenous communities. The protection should empower them to control and manage their indigenous knowledge and also afford them the rights to restrain any unauthorized use and exploitation of such knowledge. This approach has also been used in countries such as Peru, Costa Rica, Portugal, Thailand, Venezuela and Bolivia (Biyela, 2016).

The recognition of customary law in national legislation is also a form of positive protection of indigenous knowledge and by adopting this approach in South Africa means it will avail its databases to the international communities. Defensive protection aims to stop unauthorized parties from using indigenous knowledge. For example, India has used the defensive approach to protect its indigenous

knowledge (WIPO, 2002). Although a positive protection approach seems to be most favored approach and adopted by different national initiatives, a combination of both positive and defensive protection is however, recommended in order to provide effective protection and preservation of indigenous knowledge in South Africa.

CONCLUSION AND RECOMMENDATIONS

The national and international initiatives, policy frameworks and protocols were reviewed in this study in order to understand the protection of indigenous knowledge for the benefit of indigenous holders and their communities. Considerable progress has been made in promoting indigenous knowledge, and recognition of this knowledge is increasingly becoming part of the development agenda. National and local initiatives, projects and programs are emerging and increasing, policy and protocols are developed while civil societies groups are forming a broad base of support. Yet, some substantial challenges remain. South African government need to ensure that the indigenous knowledge policy and protocols are easily located and be understood by indigenous knowledge owners, communities and researchers. Cultural heritage institutions should also play a role in the documentation and preservation of indigenous knowledge and in developing policy that can guide in the preservation of indigenous knowledge. Cultural heritage institutions should also build partnerships and collaborative networks with various indigenous communities and relevant stakeholders in developing digitization and preservation projects that communities can use as tools for social development and disseminating community-collected knowledge. Knowledge outcomes must be shared in ways that benefit indigenous communities through consultations with research participants and culturally relevant processes and protocols. This study recommends that:

- Digital technologies should be applied by indigenous knowledge owners and their communities to preserve and disseminate indigenous knowledge for the use of future generations.
- Cultural heritage institutions should educate or provide training to indigenous knowledge owners on how to use digital technologies to preserve their knowledge.
- The South African government should review policy and laws on indigenous knowledge systems to ensure that they meet international requirements for the protection of indigenous knowledge.
- International initiatives and foreign national laws may be used as guidelines for the protection of indigenous knowledge in South Africa.

FUTURE RESEARCH AND IMPLICATIONS

Knowledge and cultural manifestations change but the values and worldview need to be recognized and appreciated so that they can be re-expressed in creative and relevant ways for our 21st century spaces (Keane, Khupe & Seehawer, 2017). As stated by Keane, Khupe and Seehawer (2017), we dream into a future that rests in ancient wisdom but rearticulated by bright young people, not for self-promotion, consumerism, personal gain and greed but for community well-being and the respect and preservation of nature in all its manifestations. Academics, indigenous knowledge holders and their communities, traditional and political leaders in governments need to be prepared to dismantle the colonial and its current manifestations by engaging in decolonial and anti-colonial strategies for the protection and preservation of indigenous knowledge. This study viewed digital preservation as decolonial strategy to protect and provide long-term access to indigenous knowledge, and provide ways in which indigenous researchers can share knowledge with participants for the benefit and acknowledgement of the communities or research participants as knowledge holders. Future research should thus focus more on developing indigenization and decolonization strategies. There is thus a need for increased funding and capacitating of information professionals in the digital preservation

of indigenous knowledge. The indigenous knowledge research should also follow a community-based co-design approach which is based on philosophies of participatory design and action research, which adopts fundamental principles of Afrocentricity and Ubuntu such as humanness, connectedness and consciousness.

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