Sustainability and development of EWE communities in Ghana through indigenous knowledge management practices

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Abstract

Purpose – Losing indigenous knowledge is to lose the future and impoverish the societies because indigenous knowledge is considered one of the cornerstones and survival of communities, societies and economies. This study, thus, aims to explore and assess the contextual enablers of indigenous knowledge and their role in developing and sustaining the Ewe communities in Ghana.

Design/methodology/approach – The qualitative research design, which enabled the researcher to engage the participants in an interview process and observation, was used in this study. It was augmented with a quantitative design using structured questions. Data analysis was guided by the basic principles of grounded theory. The coding system was aided by NVivo to analyze the qualitative data, while the quantitative data was analyzed using the SPSS. Descriptive analysis and graphs were deployed in the presentation of the findings.

Findings – The study discovered that the communities are in possession of several types of indigenous knowledge, ranging from tacit to explicit knowledge, which are embedded in their cultural and traditional systems and unique to every community; the culture of trust among the citizens and motivation to create and share knowledge in communities was high. Same time, family heads, farmer groups, libraries and museums played key roles in the preservation and management of indigenous knowledge in the communities. On the other hand, information officers and institutions like churches and police posts played insignificant roles in the management and preservation of knowledge in the communities just as the absence of a culture of willingness by the community members to create and share knowledge. Additionally, there was an absence of technological infrastructure, platforms, databases and policies to aid the management and preservation of knowledge in the communities. The study concludes that indigenous knowledge plays a vital role in the development and sustainability of communities in Ghana.

Practical implications – Community leaders and political leaders need to invest in systems and structures that will promote the management and preservation of indigenous knowledge for the development of the communities and the state as a whole.

Originality/value – The study demonstrates its originality in terms of scope, setting, population and empirical evidence by focusing on the role of indigenous knowledge in the sustainability and development of Ewe communities in Ghana.

Keywords Indigenous knowledge, Technologies, Culture, Library, Sustainable development, Ewe communities

Paper type Research paper

Introduction

Indigenous knowledge represents the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture over time (Varah and Varah, 2022). It reflects many generations of experience traditional skills, experiences and problem-solving techniques by thousands of indigenous people across the globe (Nelson-Barber *et al.*, 2023). Indigenous knowledge is useful to scientists, governments, decision-makers and planners alike in designing development programs (Wheeler *et al.*, 2020).

Indigenous knowledge is, therefore, an essential element for the advancement of societies and plays a crucial role in the sustainable development of cultures. As a result, there is a global need for all indigenous knowledge to be gathered, organized and disseminated in the same systematic way as other bodies of knowledge in the world, such as western knowledge. To achieve this requirement, it is important to understand the contextual factors that influence the effective management of indigenous knowledge in specific contexts. Understanding the factors in the context of Ghana will help to deal with issues that threaten the survival of indigenous knowledge, improve the effective management and preservation of Ghanaian indigenous knowledge and lead to the building of a national memory for Ghana.

In promoting sustainable development of communities, the UNESCO Institute for Information Technology in Education (IITE) report by Resta (2011) identifies a few challenges

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contributing to the digital exclusion faced by indigenous peoples in sub-Saharan Africa, including a lack of information and communication technology (ICT) systems and lack of ICT expertise among policy-makers, which results in policymakers' inability to appreciate the importance of ICT and their relevance in indigenous knowledge management; and lack of community support as an indication of poor awareness of the relationship between ICT applications and indigenous knowledge.

Ngulube (2002) further posits that the main challenges associated with the management and preservation of indigenous knowledge are concerned with accessibility, collection development policies, storage and preservation and intellectual property rights. These create a system where indigenous knowledge is lost and remains inaccessible to other people and the coming generations. These largely affect developmental projects and are unable to offer sustainable solutions to indigenous and local problems.

This study thus sought to explore and assess the contextual enablers of indigenous knowledge and their role in developing and sustaining the Ewe communities in Ghana.

Research context

The people of Ghana comprise over 100 different linguistic and cultural groups, making it a multicultural country with varying bodies of indigenous knowledge. The major ethnic groups include Akan 47.5%, Mole-Dagbon 16.6%, Ewe 13.9%, Ga-Dangme 7.4%, Gurma 5.7%, Guan 3.7%, Grusi 2.5%, Mande-Busanga 1.1%, other 1.6% (Statistical Service of Ghana, 2010). This study will focus on the indigenous people and the Ewe cultural groups.

The Ewe people, also known as Ve-Gbe people, are the native and largest ethnic group of the Volta Region of Ghana, constituting 68.5% of the region's population. They also belong to the Fon tribe that cuts across Ghana to Southern Togo, Southern Benin and South-West of Nigeria. Some Ewe people are also found in parts of the G/A and Eastern Regions of Ghana. They consist of several subgroups such as the Anlo Ewe, Tongu Ewe, Wedome and Avenor Ewe. They are mainly found in the South-Eastern part of Ghana. The Volta Region, 2024, shares a border with the West of Togo; the East of the Volta River, Greater Accra and Eastern Regions; and Oti Region to the North. Some Ewe people are also found in Sege, Battor and Kasseh in the Eastern part of the Greater Accra Region.

The study focuses on the people in the Ewe traditional communities in the Volta Region of Ghana. This will aid the assessment of the factors that aid the management of indigenous knowledge for development in Ghana, particularly, in the Ewe communities. The Ewe communities in the Volta Region of Ghana are geographically divided into 17 districts or municipalities. These include Hohoe, Kpando, North Dayi, South Dayi, Afadzato South, Ho Central, Ho West, Adaklu, Agotime Ziope, North Tongu, Central Tongu, South Tongu, Akatsi North, Akatsi South, Ketu North, Ketu South and Keta. This is presented in Figure 1 (Study setting: Ewe communities in the Volta Region of Ghana).

Each of these 17 districts and municipalities consists of different traditional authorities and communities. These communities have some cultural and traditional commonalities, which make it possible to undertake a critical and scientific study into the management and preservation of indigenous knowledge toward the development of systems and framework for the effective management and preservation of indigenous knowledge.

Literature review

Indigenous knowledge

Indigenous knowledge is unique, local and traditional that exists within and is established around the specific surroundings of native and local people (Kohsaka and Rogel, 2021), a particular indigenous geographical area at a particular time or period (Ezeanya-Esiobu, 2019). Indigenous knowledge can also be viewed as tacit knowledge and know-how (Aksa, 2020) that is community-based, non-formal, unique, dynamic,

Figure 1 Study setting: Ewe communities in the Volta region of Ghana

Source: Figure courtesy of Wikipedia, 2024

complex, eclectic and transferred from one generation to the next over time in various contexts (such as cultural, ethical, ecological, political, economic, spiritual social and technological) (Resenga Maluleka and Ngulube, 2019) to support native (indigenous/local) communities in their decision-making and problem-solving activities (Wheeler and Root-Bernstein, 2020) that are essential to their survival, adoption and existence in their everyday direct dealings and interactions with their natural surroundings (Marques *et al.*, 2021). It offers the source for local-level decision-making about many fundamental aspects of day-to-day life (Son *et al.*, 2019) such as social gathering, pastoral system (Balehegn *et al.*, 2019), agriculture, food production, fishing, animal husbandry, hunting (Sullo *et al.*, 2020; Dkhar and Tiwari, 2020), health care, management of natural resources, adoption of environmental or social change, conservational approaches, wildlife, plants, soil, water (Blankson, 2020), lifestyle and worldviews (McDonagh, 2022).

Indigenous knowledge links the survival of every human being to the wholeness of nature and its elements that support life (Fernández-Llamazares *et al.*, 2021). It presents the concrete conditions of communities concerning the surroundings and provides answers to the issues of people and the community (Brondízio *et al.*, 2021). Indigenous knowledge defines a worldview of people and offers the course for their social, cultural, economic, political and spiritual survival (Tom *et al.*, 2019). The significance of indigenous knowledge is the development of peoples' capability to recognize the sector in a completely simple manner as understanding the human self (Nakashima and Krupnik, 2018). It affords a rich ground for the development of contemporary society (Zidny, Sjöström and Eilks, 2020) and facilitates the sustainability and survival of various traditions and norms of societies (Baporikar, 2022).

Indigenous knowledge contributes to local development and self-sufficiency and increases empowerment (Irwansyah, 2021). The use of indigenous knowledge for research, innovation, development and management planning (Nyadzi *et al.*, 2021) provides credibility and legitimacy for scientists, addresses local issues with local resources and ingenuity (Limpo *et al.*, 2022) and fosters cultural pride (Resenga Maluleka and Ngulube, 2019). Indigenous knowledge enables indigenous people to make a valuable contribution to effectively manage their natural resources and local environments (Ezeanya-Esiobu, 2019) and provide a strong foundation for developing alternative methods of resource management (Irwansyah, 2021).

Enablers of indigenous knowledge

Indigenous knowledge is a critical determinant of communities and societies (Redvers *et al.*, 2022). It is, therefore, extremely essential to identify the critical indicators of success factors or enablers of indigenous knowledge. Enablers are the key factors that define and solidify the effectiveness of managing knowledge (Kesavan, 2021; De-Graft, 2019; Dei, 2017). Researchers have tried to define different critical enablers of indigenous knowledge. These include culture, leadership, strategy and technology (Kesavan, 2021; Dei, 2019).

Culture is an essential factor for successfully implementing indigenous knowledge (Lowell *et al.*, 2015). It comprises a set of beliefs, values and norms shared by members of societies. Generally, a supportive culture in a community or society is what highly promotes knowledge creation, sharing and application (Stojanović-Aleksić *et al.*, 2019). In addition, a culture that is supportive of knowledge is one that highly values knowledge and encourages its creation, sharing and application (Lam *et al.*, 2021).

Also, ICT serves as an enabler for management knowledge since it makes it possible for community members to capture, process and share knowledge (Dei, 2017; Dei and van der Walt, 2020). IT support includes hardware, software applications and a platform to share knowledge (Dei, 2017). Some important factors to be considered in the management of knowledge in communities include the simplicity of the technology, ease of use, adaptability to the needs of the user, connection with knowledge content and standardization of a knowledge structure (Dei and van der Walt, 2020). ICTs can be used to capture, store and disseminate indigenous knowledge so that traditional knowledge is preserved for future generations, promote cost-effective dissemination of indigenous knowledge, create easily accessible indigenous knowledge information systems, promote integration of indigenous knowledge into formal and non-formal training and education and provide a platform for advocating for improved benefit from indigenous knowledge (Dei, 2019). The UNESCO IITE report by Resta (2011) identifies a few challenges contributing to the digital exclusion faced by indigenous peoples in sub-Saharan Africa as well as other regions, as below:

- Lack of ICT expertise among policy-makers: As a result, policymakers might be unable to appreciate the importance of ICT.
- Shortage of teachers with ICT skills: This refers to a lack of further training for indigenous people.
- The dominance of English and other non-indigenous languages on the internet: This leads to poor representation of indigenous languages.
- Lack of community support: This is an indication of poor awareness of the relationship between ICT applications and indigenous knowledge.

Indigenous knowledge in sustainability, planning and decision-making

Indigenous knowledge of natural resources, ecological zones, aquaculture, agriculture and forest management is vital for the growth and sustainability of communities, societies and the global world (Loch and Riechers, 2021). Thus, developmental issues, decision-making and planning of communities and activities are largely influenced by knowledge and local content (Wheeler and Root-Bernstein, 2020).

Governments, political and development actors globally have, therefore, recognized the significance and important role of indigenous knowledge in all decision-making, planning and developmental activities (Zurba and Papadopoulos, 2023). The involvement of indigenous knowledge and content in the affairs and agenda of decision-making, planning and international actors or agencies is very crucial (Adeyeye *et al.*, 2019; Zurba and Papadopoulos, 2023). Furthermore, indigenous knowledge offers new developmental models that are socially and ecologically sound (Thompson *et al.*, 2020). Policy-makers and development actors must, therefore, pay

attention to indigenous knowledge in the formulation and implementation of policies and developmental issues (Chapman and Schott, 2020).

Again, indigenous knowledge is widely believed to be resource-efficient, sustainable and poses minimal risks to rural farmers and producers, and may require the use of simpler techniques and procedures (Pin *et al.*, 2021). In this way, learning from indigenous knowledge can increase understanding of local conditions and provide a productive context for activities aimed at supporting communities (Nyadzi *et al.*, 2021). Furthermore, when indigenous knowledge is managed, provides problem-solving strategies for local communities (Baporikar, 2022), enhances cross-cultural understanding, helps deepen understanding of the local situation and better serves the community and customers' investments in the dissemination of indigenous knowledge can contribute to poverty reduction (Abidogun and Falola, 2020).

Theoretical framework

The management of indigenous knowledge requires a robust model and theoretical foundation. Farooq (2019) expresses that models are frameworks that help organizations effectively manage and use their collective knowledge and expertise. Theories and models of knowledge management assist researchers and practitioners in putting dissimilar portions of a riddle collectively in a manner that leads to a profound understanding of the portions and collaboration that gets made up. A model or theorized-driven knowledge management initiative permits a better explanation of what is currently happening as well as aids in providing a better means and recommendation for realizing organizational objectives (McInerney and Koenig, 2011).

Von Krogh *et al.'s* (1995) organizational epistemology theory was deployed to guide this study. This theory developed in 1995 is the first model that clearly establishes the distinction between individual knowledge and social knowledge, following an epistemological point of view regarding knowledge management. Thus, this model identifies the minds of the people or members of the organization or community and the relationship between the individuals and society. This model advocates the need and role of knowledge workers (librarians, curators and information professionals) in the creation and dissemination of knowledge in the organization and community. Cristea and Căpaţînă (2009) disclosed that this model sought to identify some areas or aspects of knowledge that need to be analyzed to include "why and how the knowledge gets to the employees of a company; why and how the knowledge reaches the organization; what does it mean knowledge for the employee/organization; and what are the barriers for organizational knowledge management."

Knowledge creation according to this model is perceived to be transformational and based on the experiences of people and community members been transformed into knowledge through dialogue and dissemination. It promotes communication and collaboration between individuals and social actors. The cognitive components of this model support learning and knowledge acquisition and manipulation of knowledge for easy assimilation. In this perspective, the human brain and personality of people in any community or organization can be perceived as machines based on detections and logic, which does not permit opposite declarations. So, organizations and communities gather knowledge from their environment or ecosystem, which it processes logically. During the identification phase, the individual or community defines priorities for filtering knowledge and dissemination.

Again, this model identified five factors that could influence knowledge creation and dissemination in organizations or communities such as the employee, knowledge worker or community members; communication skills; organizational structure (community structure); network or link between people or workers; and management of human resources. Contextually, if the community members are knowledgeable and perceive knowledge to be relevant and useful to the community, the effect will be seen in their lifestyle and readiness to create and share knowledge. Also, if there is a common language to express and share ideas and knowledge, these challenges will be resolved. In the case where community members are willing to share experiences, it will be very easy to generate social cohesion and collaboration.

Methodology

The mixed research method was used in this research. This allowed the researcher to combine both qualitative and quantitative research methods concurrently in this study. The use of the qualitative research method enabled the researcher to engage the participants in an interview process, observation and document review. Symbolic interactionism, which assumes that people respond to elements of their environments according to the subjective meanings they attach to those elements, such as meanings being created and modified through social interaction involving symbolic communication with other people (Carter and Fuller, 2015), was adopted.

The researcher focused on the traditional segmentation of the Ewe communities (Anlo Ewe, Tongu Ewe, Vedome Ewe and Avenor Ewe). From each of the traditional, the researcher purposively selected two traditional authorities for the purpose of this study. Thus, eight traditional authorities were selected to serve as the study areas for this study. A purposive sampling technique was used and enabled the researchers to select subjects deemed representative enough for the study (Campbell *et al.*, 2020). For the purpose of this study, the participants were made up of traditional chiefs, rulers or linguists, traditional healers and opinion leaders because they are noted to be the custodians of traditions, customs, values, norms and beliefs of the communities. Other preferences were given to farmers (mainly crop and fish farmers), religious leaders (mainly traditional, Islamic and Christian leaders) and information officers (librarians, curators or archivists). Thus, 72 participants were identified to participate in the study.

A semi-structured interview (with a guide) and a questionnaire were used to collect data from the respondents. Additionally, the researcher used observation as a complementary data collection tool to the questionnaire and interview. This enabled the researcher to understand the responses of the participants and to synchronize the research findings. Data analysis was guided by the basic principles of grounded theory. The coding system was aided by NVivo (qualitative data analysis software) to analyze the data

manually and electronically. The quantitative data was analyzed using the SPSS software. Descriptive analysis and graphs were deployed in the presentation of the findings.

Presentation of findings

Data was successfully collected from the 72 sampled participants, representing a 100% response rate. The presentation of the findings is based on three thematic areas: demographic information of the respondents; factors influencing the capturing, sharing and preservation of knowledge; and some recommendations towards the effective management of indigenous knowledge.

Types of indigenous knowledge in the Ewe communities

In line with one of the aims of the study, finding out the types of knowledge created and shared by members of the community and within the community, the researcher conducted an interview. Based on this, the researcher asked the participants about the types of knowledge created and shared among themselves or within the community. Specifically, the respondents were asked to indicate the types of indigenous knowledge created and shared. Some of the respondents indicated that:

- There is a lack of policy on indigenous knowledge, collection, preservation and management of indigenous knowledge. As a result, we are unable to clearly define what constitutes indigenous knowledge and which knowledge items are to be collected and preserved.
- Identifying the types of knowledge depends on the sector and area the person is working or comes from. The religious leaders and practitioners, agricultural, chiefs and traditional leaders, teachers, educationists and community members see indigenous knowledge from different perspectives.

Despite this, the respondents were able to outline several types of indigenous knowledge, including the following:

> Indigenous fire management techniques and prevention; environmental conservation and sustainability; rivers and forest conservation; land tenancy management; fertilizer application and usage; marketing techniques; land cultivation; post-harvest management; financial support for farmers; laws, doctrines; customary adjudications and rulings; agricultural activities and practices such as crop farming activities and practices, animal and husbandry activities, fishing practices and activities, hunting activities, and harvesting activities; weather information and detecting the weather pattern; customary and traditional rites such as birth rites, death rites, puberty right, marital rites, chieftaincy installation, funeral and burial rites and information, widowhood rites, festival activities and celebration, among others; kente weaving (handmade weaving of cloths); basketry, artifacts, handcrafts among others; inheritance and property; rainwater harvesting techniques; and family, clan heads and chieftaincy succession.

The researcher also observed that these types of indigenous knowledge mentioned by the respondents were actually available in the study (Ewe) communities. The researcher observed some of these while being performed during the data collection. These include rituals, ceremonies and rites such as festival celebrations and womanhood rites (Kusarkorkor); ordinations; and farming practices such as hunting, fishing and crop farming, among others.

These responses provided by the participants clearly show that the participants really understand and know the types of indigenous knowledge that are created and shared by the community members or within the community.

Factors influencing the management of indigenous knowledge

This section presents the findings of the factors that influence the sharing, documenting and preservation of indigenous management in the Ewe communities. Cultural, institutional and technological factors were used to assess the influence.

Cultural factors in influencing the management and preservation of indigenous knowledge.

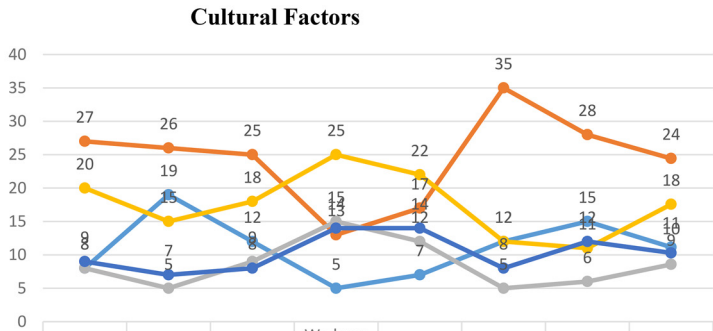
A culture that promotes the creation, sharing and preservation of knowledge allows organizations and communities to effectively manage their knowledge. The respondents were asked to indicate the extent to which the culture of willingness, trust, dedication and motivation to share knowledge; and the cultural role of family heads and farmer groups influence the sharing, documenting and preservation of indigenous knowledge in their community. The findings are presented in Figure 2.

From the graph, it was discovered that the cultural factors to promote and facilitate the management of indigenous knowledge was not encouraging, with an average of 48.61% (15.28% strongly agreed and 34.72% agreed) of the participants, indicating that cultural factors played a below-average role in the preservation and management of indigenous knowledge in their communities. Specifically, the culture of willingness to share knowledge was minimal (48.61%), just as the importance of the preservation of indigenous knowledge was also realized to be minimal (33.33), and the absence of dedicated indigenes to facilitate the capturing of indigenous knowledge (27.78%).

However, the study discovered that the culture of trust among the citizens for knowledge sharing was high (62.5%), just as the culture of motivation to create and share knowledge (51.39%) in their communities. Again, the study found that family heads played a key role in the preservation of indigenous knowledge (65.28%) in their communities, just as farmer groups helped to preserve indigenous knowledge (59.72%) in their communities. The study further revealed that farmer groups promoted the culture of knowledge creation and sharing in the communities. Some of the respondents expressed the following:

- Our leaders (farmers) help us with relevant information when it comes to planting, crop management and harvesting of crops.
- Some farmers do not like sharing information with their colleagues.
- Due to some cultural issues about some of the families, some families are unwilling to collaborate with other families in terms of ceremonies, rituals and practices. This culture of unwillingness prohibits effective knowledge management practices.
- We do not just discuss most of our technical cultural practices and what goes into those practices since they are sacred.
- Several efforts by academics and researchers have been made to facilitate the documentation of some of our traditional and customary practices but all failed. Unfortunately, the real custodians of our knowledge refuse to let them be documented. We need to encourage them to help document them. This oral transmission and

Figure 2 Cultural factors in influencing the management and preservation of indigenous knowledge



	Citizens are willing to share knowledge	Citizens trust each other to freely share knowledge	Citizens are motivated to create and share knowledge	We have dedicated indigenes to facilitate the capturing of IK	Preservation of IK is important to community members	Family heads help to preserve IK	Farmer groups help to preserve our IK	Average/ Mean
Strongly Agreed	8	19	12	5	7	12	15	11
Agreed	27	26	25	13	17	35	28	24
Neutral	8	5	9	15	12	5	6	9
Diadgreed	20	15	18	25	22	12	11	18
Strongly Disagreed	9	7	8	14	14	8	12	10

Source: Figure by author

myth surrounding most of our traditions and customs need to be overcome.

- Family and clan heads should be encouraged to document the inheritance systems, land tenure system, succession and clan headship and family practices to promote cohesion and sustainability of our community. The absence of this has created a series of problems for our family systems and succession.
- Our traditional farming and agricultural practices have not been documented. Although most of our leaders and parents have been able to pass them to us orally, we need to properly document them for the next generation, instead of the continuous use of oral means.
- Recently, we realized part of our forest has been registered by an unknown person who lured a clan head to sell it to him. This parcel of reserved forest is one of our ancestral heritage. Instead of the head of the clan discussing the sale with others, he failed to do that due to the animosity and lack of trust among some clan heads and their members.

These responses show that the family heads and leaders of the communities have a lot of roles to play in promoting a culture of knowledge management and preservation in the communities.

Institutional factors in influencing the management and preservation of indigenous knowledge

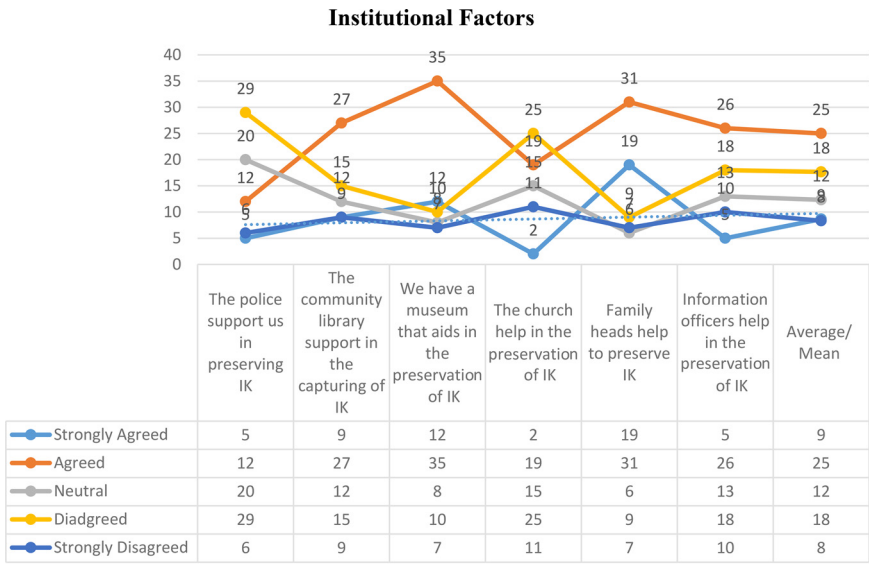
The researcher sought to find out the role institutions play in managing indigenous knowledge for the development and sustainability of the communities. The findings are shown in Figure 3.

From Figure 3, it is clear that the role of institutions as enablers to support indigenous knowledge management and preservation was generally low and below average, with an average positive rate of 48.61% (13% strongly agreed and 34.72% agreed). Specifically, the support of the police as an enabler in helping to preserve indigenous knowledge recorded a minimal agreement rate (23.61%: 6.94% strongly agreed and 16.67% agreed), while the support from the church also recorded a low agreement rate of 29.16%. Again, the role of information officers in promoting the preservation of indigenous knowledge in the communities was low, with an agreement rate of 43.06%. An average agreement rate of 50% was recorded for the role of community libraries in the management and preservation of indigenous knowledge. Despite these, the study revealed that the roles of the museum and the family heads were significant. While the agreement rate for the role of the museum in the preservation of indigenous knowledge recorded an agreement rate of 65.28%, the family heads recorded a higher agreement rate of 69.44%.

Additionally, the respondents outlined the following:

- A professional curator should be employed to manage the museum and the materials.
- We need to build a museum for the management and preservation of our artifacts and knowledge resources.
- A professional researcher and information expert is needed to help in the documentation of our cultural heritage.
- The museum in the chief palace is too small. We need to build a bigger one to be able to accommodate the stored resources at the museums.
- The schools and colleges should help us in the collection, documentation and management of our culture and heritage sites.
- A community library is needed for the collection and preservation of information and knowledge resources by the community. The community library will also help in information literacy and developing educational systems

Figure 3 Institutional factors in influencing the management and preservation of indigenous knowledge



	The police support us in preserving IK	The community library support in the capturing of IK	We have a museum that aids in the preservation of IK	The church help in the preservation of IK	Family heads help to preserve IK	Information officers help in the preservation of IK	Average/ Mean
Strongly Agreed	5	9	12	2	19	5	9
Agreed	12	27	35	19	31	26	25
Neutral	20	12	8	15	6	13	12
Diadgreed	29	15	10	25	9	18	18
Strongly Disagreed	6	9	7	11	7	10	8

Source: Figure by author

to motivate the community members to cultivate the habit of preserving and managing all knowledge assets and resources of the community.

- The churches should assist with the capturing and management of our culture and heritage through the sermons and setting up days for a display of culture and tradition.
- Family heads should facilitate the documentation of the family inheritance and succession system.
- Our community archive center should be refurbished and equipped with computer systems to support the efforts of the elders and chiefs in the preservation and management of historical records and other information and knowledge resources.
- Some of our farming tools and equipment are unique and handed over to us by our forefathers. These tools must be preserved and kept for the next generations to know farming tools and practices by our forefathers. We, therefore, need a museum in our community for this and other relevant traditional ornaments and regalia.
- The wardresses, tools and ammunition used by our forefathers (chiefs, warriors and leaders) must be displayed and showcased in an information center or museum, which is lacking in this community.
- We have lots of tourism and heritage sites in this community and around us. This includes waterfalls, botanical gardens, unique animal species, mountains, etc. We need community information centers and tourist guides to help in the education and information dissemination to our visitors.
- Our traditional and native clothes and kente (hand-woven cloths) must be showcased, marketed and sold to visitors and other people. Some of the designs and features are core to the culture, heritage and identity of the community and the Ewe people. We therefore need institutions or a dedicated center that can help us market our traditional kente and clothes.

The researcher observed the presence of libraries, archives and records centers, community resources centers and museums in some of the communities during the data collection. This observed finding corroborates the quantitative data and qualitative responses, specifically, the concerns raised by the respondents.

These responses show that despite the availability of community libraries and museums in some of the communities, most of the communities lack available institutions to aid the collection and management of information and knowledge resources.

Technology as an enabler of indigenous knowledge

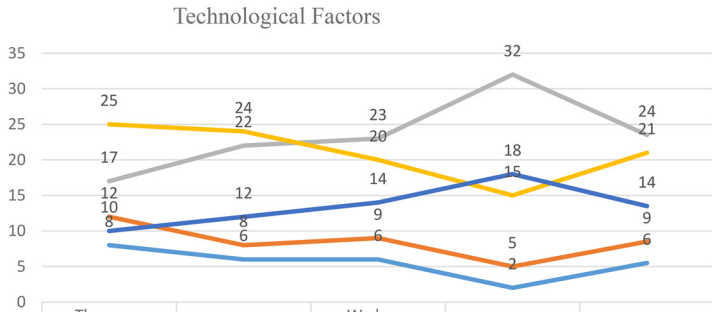
Technologies such as databases, platforms and infrastructure have been identified as critical enablers of KM practices. This section presents the findings on the influential role of technology (availability of ICT infrastructure, database, platform and policy) in supporting the preservation of IK in the selected Ewe communities in Ghana.

Averagely, it was discovered that ICT as an enabler of indigenous knowledge management practices was insignificant (20.83%), as presented in Figure 4.

The graph clearly shows that technology plays an insignificant role in the preservation of indigenous knowledge in the selected Ewe communities. Specifically, the availability of ICT infrastructure as an enabler to support the preservation of indigenous knowledge was just 27.78%; the availability of an ICT platform as an enabler was also 19.44%; while the availability of a dedicated database as an enabler to support the preservation of indigenous knowledge also recorded 20.83%. Finally, it was established that ICT policy as an enabler of indigenous knowledge was low, with a rate of 9.72%.

The respondents further outline some concerns relating to technological systems that should be deployed to aid the management of indigenous knowledge in the communities. Some of the concerns outlined include:

Figure 4 Technology as an enabler of indigenous knowledge



	There are available ICT infrastructure to support the preservation of IK	We have an ICT platform to support the preservation of IK	We have dedicated database to support the preservation of IK	We have ICT policy to support the preservation of IK	Average/ Mean
Strongly Agreed	8	6	6	2	6
Agreed	12	8	9	5	9
Neutral	17	22	23	32	24
Diadgreed	25	24	20	15	21
Strongly Disagreed	10	12	14	18	14

Source: Figure by author

- We live in a technological era where everything is driven by ICT. So, we believe this will largely help in our quest to capture, process, disseminate and preserve knowledge resources and assets in our community.
- We need an ICT center with state-of-the-art databases and repositories that will help in the preservation of knowledge resources.
- Some of our historical records need urgent migration into a digital platform. Technological systems are needed to aid the migration and encapsulation of these records and to prolong their use and accessibility.
- The IT systems in the library are obsolete and unable to meet the current needs of digitization of knowledge resources.
- We need a website that will help us showcase our tourism, cultural, heritage sites and customary rites and ceremonies.
- Our staff and community members must be trained on the use and significance of deploying ICT to the management of knowledge.

These responses show that although the respondents think technology plays a vital role in the management and preservation of indigenous knowledge in the communities, there is the absence of technological systems, lack of skills on the use of the available systems and obsolesce nature of the available technological tools.

Role of indigenous knowledge in the development of the communities

Indigenous knowledge plays a significant role in the development and sustainability of communities (Loch and Riechers, 2021; Wheeler and Root-Bernstein, 2020). In line with this, the respondents were asked to outline some of the roles they think indigenous knowledge can play in the development of their communities. It was revealed that indigenous knowledge plays a critical role in the sustainability and development of the communities. Some of their responses are outlined below:

- Indigenous knowledge helps in the preservation of cultural heritage.
- Indigenous knowledge consists of beliefs, customs and values that have been passed down through generations. This belief and customary system is what serves as the foundation for every developmental agenda.
- We have always used customary and traditional belief systems to preserve and conserve our forest and river bodies.
- Our health system has always been based on the use of herbs, trees, soil and other unexplainable substances. This has been useful and sustained us for centuries. Modern health systems are even dependent on the traditional health system.
- They say cleanliness is next to godliness. Our traditional system has been able to enable us to maintain the environment. Our environment and surroundings have been clean and will remain clean as we continue to use traditional beliefs and customary systems to manage and preserve them.
- If not for the use of traditional and cultural belief systems, our animal species and its ecosystem would have been gone by now.
- We have always harvested and conserved water using traditional rainwater and water harvesting systems.
- Our communal spirits, togetherness and sense of belongingness have been able to unite us for developmental issues.
- Food and crop preservation has been made possible due to the use of the sun, herbs and other traditional practices.
- Spirituality and belief in the spirit being and gods have made our communities free from crimes and thefts.
- Our agricultural practices have been sustained due to the use of traditional practices and belief systems. Some of our

belief systems prevent farmers from cutting down some trees or fishing along some river bodies and on some days.

These responses show that indigenous knowledge and adherence to some belief systems and cultural practices have helped in sustaining and developing the communities

Discussion of findings

Types of indigenous knowledge

Managing knowledge calls for understanding the nature and types of knowledge created and shared (Dei, 2019). As disclosed in the study, the communities possess several types of indigenous knowledge. Principally, they pertain to both tacit and explicit knowledge. The tacit knowledge was mainly based on experiences, skills, doctrines, laws, belief systems, customs, norms, rituals, rites, ceremonies and many other practices that have not been codified or documented. The explicit indigenous knowledge identified includes artifacts, forming tools, symbols and documented practices or activities. This was evidenced by observations of the researcher during data collection. This finding is positive as an appreciation of the types of indigenous knowledge serves as the foundation for the management and preservation of the knowledge resources. The respondents will also be able to appreciate the factors that influence the management of indigenous knowledge knowing the types of knowledge resources available at the communities.

This finding supports the theoretical foundation for this study, the von Krogh and Roos on organizational epistemology theory, which identifies the individual knowledge (skills, experiences, know-how, etc.) and social knowledge (comprising knowledge assets and resources of significance to the society) as key knowledge elements.

Factors influencing the management of indigenous knowledge

Cultural factors

A culture of knowledge creation, sharing and management is fundamental to the growth of every community. The study discovered that the culture of trust among the citizens for knowledge sharing was high just as the culture of motivation to create and share knowledge in their communities. Bengoa and Kaufmann (2016) posit that the culture of trust promotes effective knowledge creation and sharing as was the case in this study. Thus, the culture of trust promotes openness and the quest for knowledge creation and sharing in communities. The findings further support Nguyen *et al.* (2019) who states that when people are motivated to create and share knowledge, it promotes a good culture of knowledge management. The culture of trust and motivation to create and share knowledge should lead to appreciating the value of knowledge and the willingness to create and share knowledge. However, this was not the case as the study realized that there was a low culture of willingness to share knowledge among the community members. This could be attributed to the community members' inability to value or place relevance on knowledge creation and preservation and the absence of dedicated indigenes to facilitate the capturing and preservation of knowledge in the community. This contradicts the findings of Dei (2019) and Manuri and Yacoob (2011) who posit that a culture of appreciation and value for information and knowledge influences the culture of knowledge creation and sharing. Dei (2019) therefore proposed that the culture of willingness should be promoted among members for effective knowledge management practices.

Again, the study found that family heads and farmer groups played a key role in the preservation of indigenous knowledge in their communities. Furthermore, the family heads who are the custodians of indigenous knowledge at the family supported knowledge management activities. Storytelling, which is a principal means of sharing indigenous knowledge, is usually done by family heads. The findings support the organizational epistemology theory, which community members promote knowledge management initiatives.

The organizational epistemology theory identified five factors that could influence knowledge creation and dissemination in organizations or communities consisting of the knowledge worker, or community members; communication skills; organizational structure (community structure); network or link between people or workers; and management of human resources. Contextually, the community structure that comprises the culture tends to serve as an enabler or otherwise for managing knowledge resources and assets in the communities. If members are knowledgeable and perceive knowledge to be relevant and useful to the community, the effect will be seen in their lifestyle and readiness to create and share knowledge. Also, if there is a common language to express and share ideas and knowledge, these challenges will be resolved. In the case where community members are willing to share experiences, it will be very easy to generate social cohesion and collaboration.

Institutional factors

Libraries, museums, archive centers, records centers and information centers are identified as places for collecting, preserving and making available information and knowledge resources (Harvey and Mahard, 2020). The study disclosed that community libraries in the study areas served as centers for the management and preservation of knowledge in the communities. According to Singh (2020), libraries as institutions are information centers with information management tools that bring together collections, services and people in a full cycle of the gathering, capturing, dissemination, use and preservation of information and knowledge resources.

The purpose of museums is to collect, process, preserve and display artifacts, cultural systems, ornaments, traditional objects, drawings and objects of artists or any knowledge resource that is of relevance for the sustainability and development of a society (Udok *et al.*, 2023). The presence of museums in most of the chiefs' palaces of the communities could be attributed to the high rate of the role of museums in the management and preservation of knowledge in the communities. Furthermore, as family heads are seen as the custodians of knowledge, they serve as institutions for the preservation and management of knowledge in the communities. The relevant role of family heads as institutions of knowledge is also realized by Cobbinah *et al.* (2020) that traditional authorities act as custodians of customary land, community values and norms, which are highly revered by all citizens, and exercise considerable authority over land in their jurisdictions.

Churches have also served as safe places for the collection and preservation of information and knowledge resources in communities (Maru *et al.*, 2020; Evans, 2006). Indeed, the first public library in Ghana, Anglionby Library, was set up by the Anglican church, which facilitated the gathering of religious materials and some cultural materials (Atiemo, 2019). This was not the case in this study as it was discovered that the churches played a minimal role in the preservation of information resources and knowledge items of the communities despite the presence of many churches in the communities. Maru *et al.* (2020) indicated that churches in Africa have a long history of protecting and preserving indigenous forest as sanctuaries for prayers and burial grounds. This calls for churches to play a significant role in the preservation and conservation of the environment and indigenous knowledge resources. Similarly, despite the presence of police posts in most of the communities, they played minimal role in the management and preservation of indigenous knowledge. Arguably, the police post is meant for the maintenance of law and order but not the management and preservation of information and knowledge resources. The finding is reflective of the real core role of the police as not institutions of knowledge.

Information officers aid in the collection and management of knowledge (Maina, 2012). This was not the case as the study recorded that the role of the information professionals in the management and preservation of knowledge in the communities was insignificant. This could be because the family heads are more trusted as custodians of knowledge in the communities than the information officers. The organizational epistemology theory identifies knowledge workers (curators, librarians, archivists and information professionals) or community members; organizational structure (community structure); and network or link between people or workers influence knowledge management activities in communities.

Technology as an enabler of indigenous knowledge

Technologies such as databases, platforms and infrastructure have been identified as critical enablers of KM practices (Dei, 2019). Averagely, it was discovered that technology as an enabler for the management and preservation of knowledge in the communities was insignificant. Specifically, there was the absence of technological infrastructure, platforms, dedicated databases and policies to aid the management and preservation of knowledge in the communities. This was corroborated by the observation findings from the researcher during data collection. Most of the communities under study lacked the financial strength to acquire and deploy technology for most of their activities. This could be the rationale for the absence of the technological infrastructure, platforms and databases. Furthermore, policies set the standard on how technology can be deployed to aid the management and preservation of knowledge and ensure that everyone knows what is expected of them and how to use technologies in terms of knowledge management and their relevance to organizations and communities. The absence of this can be attributed to the absence of the technological infrastructure, platform and databases in the communities.

This finding supports works of literature such as the low local content on the Web (Greyling and Zulu, 2010); the obsolescence of the use of ICT devices and media (Resta, 2011); the lack of a national indigenous system policy framework to support ICT initiatives and indigenous knowledge management (Resta, 2011); absence of a clear policy on intellectual property rights (IPR) in most African countries (Jain, 2014); lack of technology training and support, resulting in an inability to use ICTs to record, store and process indigenous knowledge (Lwoga, 2009; Resta, 2011); and the lack of basic infrastructure, which includes electricity, computer hardware and software, high cost of technology and limited budget allocations for ICT maintenance and lifecycle (Resta, 2011).

Role of indigenous knowledge in the development of the communities

Indigenous knowledge plays a significant role in the development and sustainability of communities (Ankrah *et al.*, 2022; Leal Filho *et al.*, 2022). This study revealed that indigenous knowledge has played a critical role in the sustainability and development of the communities. Precisely, indigenous knowledge helped in the preservation of cultural heritage; rainwater harvesting and conservation; and preserving and conserving our forest and river bodies. It has been revealed that traditional water conservation techniques are deployed by local communities to sustain farming and household activities (Mandizvo *et al.*, 2022). For instance, ponds are used to sustain the farming activities (such as fish farming and crop farming) of local communities (Basu and DasGupta, 2023). Water irrigation using local technologies also helps farmers plant in all seasons (Aklan *et al.*, 2023). Locally adopted conservation practices should be deployed to address the effective formulation and implementation of environmental and land conservation programs and climate adaptation (Ankrah *et al.*, 2022).

The study again revealed that indigenous knowledge makes the communities free from crimes and thefts; maintains some species of tree; ensures cleanliness of the environment; maintains varieties of animal species and its ecosystem; food and crop preservation; and serves as the foundation of health system through the use of herbs, trees, soil and other unexplainable substances. Data from WHO indicate that as of 2012, nearly half the population of most industrialized countries in the world now use some form of traditional medicine (the USA, 42%; Australia, 48%; France, 49%; Canada, 70%); practices alongside western medicine. Chile's health system is 71% indigenous, while some African Countries' health system is 80% indigenous based (Kasilo and Wambebe, 2021).

Conclusion and recommendations

This study thus sought to explore and assess the contextual enablers of indigenous knowledge and their role in developing and sustaining the Ewe communities in Ghana. It was discovered that the communities are in possession of several types of indigenous knowledge, ranging from tacit to explicit knowledge. This knowledge is embedded in their cultural and traditional systems and unique to every community. Generally, the culture of trust among the citizens for knowledge sharing was high just as the culture of motivation to create and share knowledge in their communities. Same time, family heads and farmer groups played a key role in the preservation of indigenous knowledge in their communities. However, the

culture of trust and motivation to create and share knowledge could not translate into the culture of willingness by the community members to create and share knowledge.

Although community libraries and museums as institutions of information and knowledge management played significant roles in the management and preservation of knowledge in the communities, other institutions like churches and police posts played insignificant roles in the management and preservation of knowledge in the communities. Information officers who play in the collection, processing, management and preservation of information and knowledge resources were seen as playing an insignificant role as custodians of indigenous knowledge in the communities under study. Additionally, there was an absence of technological infrastructure, platforms, dedicated databases and policies to aid the management and preservation of knowledge in the communities.

It can be concluded that indigenous knowledge plays a vital role in the development and sustainability of communities such as the Ewe communities in Ghana. It is therefore important for community leaders and political leaders to invest in systems and structures that will aid and promote the management and preservation of indigenous knowledge for the development of the communities and the state as a whole.

Based on these, the following recommendations are made:

- The chiefs, elders and leaders of the communities should sensitize the community members on the usefulness and relevance of managing and preserving indigenous knowledge, and that they should be willing to share and contribute to this cause.
- Because some of the identified knowledge resources in the communities include tourism activities, and festival celebrations, among others, the political leaders and government should deploy policies and systems to promote and attract investors and people to the communities. This will help boost the local economy of the areas and help the government generate revenues.
- Investments should be made in the building of libraries, museums, archive and records centers and community information centers to aid the collection, management and preservation of indigenous knowledge in communities.
- Use qualified and competent information professionals to help manage the information center, museums and libraries and help in the management of indigenous knowledge resources.
- Invest in the deployment of technological infrastructure, systems, databases, repositories and platforms to facilitate the capturing and preservation of indigenous knowledge.

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