Here is a world that represents a heritage that nature and forests have nourished, populated and preserved over the centuries: it refers to environments inhabited by animals, birds, plants and insects. It is a heritage which contains the ancient and ancestral meanings of totems and symbologies in African tribes, attributable to their wisdom, dignity, perseverance, mystery, vigilance, patience, prosperity, seduction, magic, prophecy, ferocity, security, courage, honor, and also includes healing functions and properties for allergies, rashes or medicines, it symbolizes love, spirituality, protection, fortune, divination, fertility, wealth. Reading this work, we are fascinated and after some initial hesitation regarding the novelty of the content that distinguishes it, it is inevitable to ask the question: "Is it relevant to the intent and objectives and, therefore, to the topics of the Journal?" Although not immediate, the answer was as follows: "This world and its cultural and emblematic dimension must represent, and continue through time, to be a heritage to be conserved and preserved from damaging anthropic interventions and activities with purely utilitarian ends". And, as such, to highlight that environmental assets (understood also as cultural assets), as the expression of cultural identity of each country is naturally comprised among the topics of the present Journal ". The captivating and innovative subject, moreover, gives rise to the important and topical issues regarding the content discussed in the paper, related not only to the African world but also to the western world.

Editor-in-Chief

AFRICAN TOTEMS: CULTURAL HERITAGE FOR SUSTAINABLE ENVIRONMENTAL CONSERVATION

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1. Introduction

Development professionals treasure indigenous knowledge because they find it extremely useful in solving problems relating to health, agriculture, education and the environment, both in developed and developing countries [1]. According to the World Bank, indigenous knowledge is relevant on three levels in a development process. At the first level, it is important for the local community in which the bearers of such knowledge live and produce. At the second level, development agents such as Community Based Organizations (CBOs), Non-governmental Organizations (NGOs), governments, donors, local leaders and private sector initiatives need to recognize the importance of indigenous knowledge and consequently, enhance its value and appreciation in their interaction with local communities. Lastly, indigenous knowledge forms part of global knowledge through its potency and the role of traditional African belief systems in natural resource management and conservation. The presence of multiple interacting threats to biodiversity and the increasing rate of species extinction make it critical to prioritize management efforts on species and communities that maximize conservation success.

In this context, indigenous knowledge needs to be preserved, transferred, or adopted and adapted [2]. Attuquayefio and Gyampoh argue that before the advent of modern natural resource conservation methods, traditional societies operated a complex religious and cultural belief system via norms, myths, taboos, totems and closed seasons to preserve, conserve and manage certain natural resources. The use of these belief systems helped in protecting and promoting the conservation of the natural environment. Indigenous communities in Africa are constantly struggling to maintain their rights, their traditions and their indigenous knowledge in a system dominated by a western worldview. They face the challenge of living in two worlds; the indigenous and the non-indigenous one. The two world views are in constant tension with each other, with the latter having more power in shaping the former. As a result, indigenous populations suffer from invasion and oppression where their indigenous knowledge has been eclipsed by western knowledge, imposed on them through western institutions. Their diverse forms of indigenous knowledge, deeply rooted in their relationship with the environment as well as in cultural cohesion, is disappearing. Such indigenous

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knowledge would allow these communities to maintain a sustainable use of natural resources and to enhance their culture from one generation to the next [3].

Also, the current increasing rate of natural resource loss is a major threat to both human and animal survival. The loss of each species comes with the loss of potential economic benefits, as well as interfering with or even destroying the balance of the ecosystem [4]. As such, there has been an increased interest in issues relating to the environment all over the world. Academics have taken greater interest in conducting research into indigenous knowledge in response to environmental issues and the failure of "development projects" [5].

This paper discusses the significance of totems through socio-cultural belief systems in Africa to conserve natural resources. The paper identifies a number of African totems and their cultural symbolic meanings; it then explores the implication of such totems for environmental sustainability. Despite the existence of common experiences on environmental conservation, the authors acknowledge the diversity and uniqueness of indigenous communities around the continent. The examples used are therefore not exhaustive nor do they pretend to be universally representative of all indigenous groups.

The main purpose of the study was to explore forms of Indigenous Knowledge Systems (IKS) practiced among selected tribes in Kenya and South Africa through symbolic totems and relate them to issues of environmental conservation. There is extensive destruction of vegetation due to human activities, killing of animals, pollution and drying of rivers. There is, therefore, an urgent need to provide solutions to reduce or prevent further degradation in addition to finding ways of enhancing the contribution of indigenous knowledge to environmental conservation.

2. Literature review

2.1. Indigenous knowledge

Indigenous knowledge (IK) is knowledge that local people in a given area or community have developed over time and which they continue to develop [6].This means that indigenous knowledge is dynamic and is not only confined to the original inhabitants of one area, but rather, is knowledge which is locally developed and continues to evolve [6,7,8,9]. Grenier further clarifies that indigenous knowledge: "*is the unique traditional knowledge existing within and developed around specific conditions of women and men indigenous to a particular geographical area.*" [8]. What makes the knowledge indigenous is its inalienable link to the native people of a particular locality. Indigenous knowledge is usually shared and communicated orally through cultural practices such as stories, songs, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment, materials, plant species and animal breeds [8,6]. This explains why the preservation of indigenous knowledge is vital to environmental conservation, as discussed in the present study.

2.2 Environmental conservation

Conservation and management are among the most important elements of sustainable development [10]. There is no single definition of environmental conservation; however, several definitions have been coined for the concept with some scholars stressing the structural roots of anthropological interests. For example, Usher defines environmental conservation as the maintenance of genetic species and ecosystem diversity in the natural abundance in which they occur [11,12]. Thomas, on the other hand, defines environmental conservation as the sacrificing of immediate rewards in return for delayed ones. Smith and Wishnie see environmental conservation as actions that prevent or mitigate biodiversity loss designed for such purpose [13]. Rim-Rukeh *et al* view conservation as the management of valuable natural resources such as timber, fish, topsoil, minerals, forests, wildlife, parkland and wilderness and watershed areas [14]. In this present study, conservation is viewed as the maintenance and protection of natural resources for the survival of all living things through the use of African totems and taboos. Environmental degradation has seen various international conferences being held, aimed at protecting our environment, yet the destruction of the biodiversity is continuing at an unprecedented rate [15]. Studies have shown that people protect their natural resources using taboos and totems [16]. For example, Millar argues that the spiritual world in Ghana is the major driving force that regulates the performance of all traditional institutions in their quest to manage natural resources [17]. Wildlife species regarded as totems in many parts of Africa have a historical or socio-cultural significance, as well as symbolic, for clans that adhere to these traditions and beliefs.

2.3. Totem

A totem is any natural or mythical animal, plant, bird or insect which serves as a symbol of a family or clan whose members feel a close connection to during their lives [18]. Some tribes in different parts of the world, including Africa are inclined to refer to totems that give them insight and understanding of their lives since they consider them to be holy and sacred. According to Freud and Alun, people who believe to be of one blood, descendants of a common ancestor, and are bound together by common obligations to each other by a common faith, reverence that totem [19,20]. Members of these ethnic groups, clans, or family do not eat, kill or trap such totemic animals, birds or fish. When a totemic object dies or is sold, members of the group it represents would show respect, for example, by mourning and burying it as in the case of a human being [21]. This is because they believe to be ancestrally related to them as a tutelary spirit. Totems have been used basically, to preserve humanity, in that it has in many ways culminated in the conservation of other life forms bequeathed to humankind on whom one is dependent such as sacred forests, rocks, mountains and rivers.

2.4. Symbolism

Symbolism is defined as the applied use of symbols that carry particular socio-cultural and spiritual meanings [19]. In the process of discovering their identity, Africans restore the heritage that has been scattered, hidden, suppressed, denied, distorted

and forbidden, through the use of symbols such as animals, birds, plants, insects or fish. It is through what these living organisms symbolize that Africans in their specific natural and cultural environments discover themselves. This paper presents the role played by totems through the cultural symbolic meanings they embody to enhance environmental conservation. The study has been motivated by the fact that, despite the potency and the role of traditional African belief systems in natural resource management and conservation, little attention has been given to this informal institution [22]. This could be attributed to the advent of western technology, the growing influence of foreign religion and beliefs, lack of regulations to enforce traditional rules, and problems of migration, urbanization and resettlement [23].

3. Methodology

The study was based on a cross sectional survey of literature reviews among randomly sampled tribes in Kenya and South Africa. Secondary data was derived from relevant library data which were gathered from published and unpublished books, articles in journals, government records, and websites. The reviewed literature concentrated on totems, symbolism and environmental conservation. Totems were categorized under different themes for data presentation and analysis.

One approach to natural resource conservation and management is the use of indigenous knowledge belief systems of totems, as discussed below.

4. Totem animals

4.1. Peacock

Figure 1. Peacock

The term “peacock” is commonly used to refer to birds of both sexes. Technically, only males are peacocks and females are peahens; together they are called peafowl. Peacocks are mainly ground-dwelling birds preferring forests and farmland. They can also be found in bushlands and rainforests. Many will nest on the ground while some will roost in trees. However, peacocks are one of the birds listed as vulnerable to

extinction due to hunting and a reduction in extent and quality of habitat [24]. Luckily, there are certain African clans and tribes that protect peacocks and preserve their habitat against destruction because of their totemic cultural function. For instance, a peacock is a totem bird for a number of clans/tribes in African countries such as the *Tswana* in South Africa. A peacock is a majestic and mystical totem that symbolizes inner wisdom. Whenever a peacock visits, it is an invitation to view higher aspects of oneself through the image displayed in its feather plumes. Peacocks are thus protected since members of the community are prevented from using them for domestic and commercial uses. This stems from the belief that a peacock is their lesser god. The totem can be kept as a pet and thus treated with religious respect with the belief that it is connected to the supernatural being.

4.2. Vulture

Figure 2. Vulture

Vultures constitute an important functional group in many ecosystems, providing crucial ecosystem services both in natural and humanized environments. However, the number of these scavengers are drastically dwindling worldwide as they are particularly vulnerable to extinction. As a result, their populations are facing massive declines in most ecosystems. Several causes have been reported throughout the world, with intentional poisoning and sanitary regulations in Europe and poisoning by diclofenac residuals in livestock carcasses in Asia being the most outstanding in those continents. In Africa, multiple decline causes have been reported, such as unintentional and intentional poisoning, intensive use for traditional medicine and sorcery and hunting for food, as the threats with the greatest reported impact on vultures. As a key-stone species, vulture declines have a wide range of impacts including effects on human health, economic costs of disposal for local communities, cultural and religious values and several other biodiversity impacts. Some cultural beliefs among a number of African clans and tribes work to the benefit of protecting vultures and conserving their habitats. The vulture also known as *lenong* among the *Tswana,* is a totem animal for particular *Tswana* clans. The vulture symbolizes dignity, perseverance, mystery, vigilance and patience. The vulture teaches members of the clan the ability to accept help from others with graciousness and dignity. It is forbidden to eat the flesh from this bird, and it is believed that if eaten the whole body would swell.

4.3. Owl

Figure 3. Owl

Owls are found in most parts of the world, except for Antarctica. They live in a variety of habitats including forests, grasslands, deserts, forests, prairies and even the Arctic tundra. They nest in trees, in holes, in the ground, in barns, and in caves. However, more than 1,300 owl species across the globe face extinction driven by the loss of places to live and breed. For each bird, the impacts of human activities on the landscape, such as logging, have caused the destruction or disappearance of their habitat, which has led the International Union for Conservation of Nature [24] to list owls as one of the endangered/threatened bird species. Furthermore, for some African communities such as the *Luyia, Luo* and *Kalenjin* tribes in Kenya, an owl is considered as a bad omen [25]. As a result, many owls are normally killed by members of these tribes, wherever they are seen. However, for other tribes such as the *Tsonga* clans in South Africa, the owl is respected and conserved for the future prosperity of the community. Among these clans, the *Morubishi* (owl) symbolizes wisdom, seduction, magic, hidden secrets and prophesy. Its ability to navigate through the darkest night and bring back nourishment for itself and others is the foundation of this essence. Those who honour the owl understand the power of magic. For these reasons, an owl should never be killed nor should its habitat be destroyed by members of the community.

4.4. Crocodile

Crocodiles (*Crocodylus mindorensis*) are classified as *critically endangered* on the IUCN Red List of Threatened Species [26]. Hunting, the use of destructive fishing methods, chemicals and the conversion of freshwater habitats continue to threaten the remnant crocodile populations in Africa [27]. Despite the threat, a crocodile (*Ingwenya*) is a totem animal among some *Zulu* tribes in South Africa. For these tribes, a crocodile symbolizes a fierce fighter. Members of this clan believe in themselves as fierce fighters and therefore, they have a sacred attitude towards the animal. Every day, they pray to their god for the safety and prosperity of the crocodile. Many rivers and streams that provide sources of drinking water and a natural habitat for crocodiles are protected on

the basis that the lesser gods and other living spirits reside therein. Due to the value attached to crocodiles, water bodies are protected from being mismanaged, and plants and animals, including fishes living in the water bodies are not harvested.

Figure 4. Crocodile

In some *Luhya* tribes in Kenya, it is believed that crocodiles (*chikwena)* are human beings. It is therefore a taboo for any member of the community to injure these sacred animals; crocodiles are also seen as the incarnation of important ancestors. Thus, to kill a crocodile is tantamount to killing a human member of their community. It is considered a murder, one of the most heinous kinds and would bring disaster upon the clan. For this reason, people are extremely careful where these sacred crocodiles are concerned. The presence of crocodiles in many water bodies, therefore, make it mindful for the people to manage their water sources in such a way that the crocodiles are not found wanting.

As a result, harmful chemicals are not used for fishing in and around the water bodies in the community. No matter the reason for such practices, one certain thing is that biological diversity (flora and fauna) is conserved [28].

4.5. Leopard

The leopard's (*Panthera pardus*) broad geographic range, remarkable adaptability and secretive nature have contributed to a misconception that this species might not be severely threatened across its range. However, it is reported that not only are several subspecies and regional populations critically endangered, but also that the overall range loss is greater than the average for terrestrial large carnivores [29, 30, 31].

Leopard habitats include tropical forests, grassland plains, deserts and alpine areas [29]. Leopards can also persist near major towns, including Mumbai [32] and Johannesburg [33]. However, the leopard is declining across its range similarly to other large carnivores [34]. The key threats include habitat loss and fragmentation, prey depletion, conflict with people, unsustainable trophy hunting, poaching for body parts, and indiscriminate killing [35]. The IUCN classifies the leopard as *vulnerable* [26]. Despite their vulnerability, a leopard is a totem for most tribes in Africa. In Kenya for example, for the *Tachoni* tribe, a leopard (*ingwe)* symbolizes courage. Circumcised men and women of the *Tachoni* tribe are expected to be courageous like their totem. For this, the *ingwe*

is normally used as a key player in *Tachoni* initiation rituals. It is a taboo for a *Tachoni* to kill a leopard [28]; and among some *Zulu* clans, a leopard, also called *ingwe,* is totemic. To the clan, a leopard symbolizes nobleness and honour. Members of this community are therefore expected to honour a leopard by preserving its habitat and its life.

Figure 5. Leopard

4.6. Snake (Python)

Within Asia, Africa, Oceania and Australia, pythons stay in relatively warm, wet climates. Many species thrive in rain forests, though pythons also live in grasslands, woodlands, swamps, rocky outcrops, dunes and shrubs, according to the San Diego Zoo. Pythons shelter in hollows, debris, farms, under rocks, in abandoned mammal burrows and tree branches depending on the species. Thirteen species of python are on the IUCN's Red List of Threatened Species [13]. Pythons (*Python kyaiktiyo*) are listed as vulnerable, with humans as their primary threat by regularly killing them for their skins. Based on IUCN assessments of nearly one in five reptile species, it estimates that 28% of pythons are threatened. As vital predators in sensitive habitats such as rice fields, their decline has wider ecological consequences, such as climate change. The main problems faced by snake populations and the cause of their decline include loss or deterioration of habitats and a diminishing number of prey.

Figure 6. Python

Pythons are thought by some clans such as the *Luo* and *Luhyia* of Kenya, to be sacred. Such sacred snakes may not be killed by members of the respective clans. The clans associate snakes with the living dead or other human spirits and such snakes are given food and drink when they visit people's homes. Among the *Avatecho* clan of the *Bukusu,* pythons are not killed as it is believed that they bring more harvest and luck to the community. Consequently, each member of the *Avatecho* clan is expected to rear a python(s) which is usually handed down from one generation to another. They believe that the killing of pythons results in instant death. Bushes and trees within the homestead are not supposed to be destroyed because they habour such snakes. The same protection applies to cobras, commonly referred to as *omieri* among the *Luo* of Kenya. Among some *Tswana* clans, a snake symbolizes renewal (shedding old skin), sexuality, higher knowledge and transition. For these reasons, snakes together with their natural habitats should be protected by members of this community. The surrounding forestlands are consequently protected on the basis that snakes reside in the trees found in and around the homestead.

5. Totem Plants

5.1. Thyne

Loss of habitats, especially the conversion of tropical forests into agricultural and urban areas, is the main driver of the biodiversity crisis being observed today. Around 43% of the terrestrial world surface has been disturbed and the original vegetation converted into anthropogenic new habitats. Extinction rates of plants such as thyne are estimated to be more than two orders of magnitude higher in this century. Thyne, otherwise called *iboza/ibozane* among particular clans in *Zulu* is a totem plant. They hold the plant so sacred to the extent that there exists a taboo against any form of destruction or damage to the plant by members of the clan. The violation of the taboo results in a generational curse. Similarly, among the *Khibe,* a *Bukusu* clan in Kenya, thyne *(inderema)* is a totem plant. All present-day members of the *Khibe* do not eat the *Inderema* vegetable. If *Khibes* eat the vegetable, they will develop a skin rash as-

sociated with allergy. It is also strongly believed that eating one's totem leads to loss of teeth [36].

Figure 7. Thyne

5.2. Krantz Aloe

Figure 8. Krantz Aloe

Aloe vera, also known as medicinal aloe, is a species of succulent plant of the genus Aloe that is believed to have originated from Sudan. *Aloe vera* grows in arid climates and is widely distributed in Africa, India, and other arid areas. Many scientific studies of the use of extracts of *Aloe vera* have been undertaken. Based on the results, there is some preliminary evidence that *Aloe vera* extracts may be useful as a herbal medicine, such as in the treatment of wound and burn healing, minor skin infections, sebaceous cysts, diabetes and elevated blood lipids in humans. *Aloe vera* is also known for its culinary uses and as a food substance. These uses have caused *Aloe vera* to be listed among the endangered plant species due to its regular harvest. However, among some clans among the *Zulu* of South Africa and *Luhyia* of Kenya, the *Aloe vera* plant can never be used for medicinal purposes or destroyed because the plant

is believed to be sacred. Among the *Zulu*, the plant is called *Inkalane* or *umhlabana* and among the *Luhyia* of Kenya it is called *esikakha*. Among these tribes, the plant symbolizes love, spirituality, protection and luck. Members of the respective clans must plant *Krantz aloe* in their homesteads, nurture the plant and protect it against any form of destruction such as harvesting to attract good tidings to the home. *Krantz aloe* is planted around homes in the belief that it wards off lightning and evil spirits. Exposed roots are always covered with soil [37].

5.3. Fig tree

Figure 9. Fig tree

Tree survival plays a central role in forest ecosystems. Habitat destruction is the leading cause of the loss of global biodiversity. According to the Food and Agriculture Organization (FAO), deforestation produced an annual average loss of 12 million hectares between 1980 and 1995 and has physically changed forest landscapes in all continents. These changes alter the physical space where species grow and interact, and thus trigger biological responses that may lead to biotic collapse. There is evidence however, that not all species equally decline towards extinction following habitat destruction, with some species being at greater risk in fragmented landscapes than others. Fig trees are one of the tree species on the decline through deforestation activities due to the high demand of charcoal, firewood and timber in Africa. Therefore, a major conservation task for ecologists consists in identifying the factors that globally drive species sensitivity to habitat loss.

A fig tree is a sacred plant among many societies throughout Africa. Therefore, the tree is a totem plant in many tribes and clans in Kenya such as the *Gikuyu, Meru, Luo* and some clans among the *Luhyia*, South Africa not being an exception. For example, in some *Zulu* clans, a fig tree (*Umvubu*) symbolizes divination and fertility. Hence, the *Zulu* clan make offerings, sacrifices and prayers around or under it. Among the *Tachoni, a Luhya tribe,* (*Omutoto)* and *Gikuyu* (*mugumo*) of Kenya, the tree symbolizes spirits, gods and power of the community. The *Gikuyu* consider the *mugumo* tree as

sacred and prayers and offerings are performed under it. Rituals and curses are also performed under the fig tree. It is believed that if one lies, the tree could bring him or her bad luck or even kill them. It is a taboo among these communities for a fig tree to be cut or destroyed for whatever reason and must not be used as firewood. If by chance a fig tree falls, rituals are performed to appease the gods in order to protect the communities against their wrath [38, 28].

6. Totem insects

6.1. Ant

Figure 10. Ant

Ants are ubiquitous in nature, playing key ecological roles, not only in tropical and temperate ecosystems, but also in harsh environments like deserts and alpine habitats. Two of their ecosystem functions are pollination and seed dispersal. Most ants live in logs or in the hollow stems of weeds and nests, which may be located in the ground or under a rock or built above ground and made of twigs, sand or gravel. These habitats are frequently destroyed by human activities such as logging, the use of pesticides, fertilizers and farming. During such activities ants are endangered. On the contrary ants, including their habitats, are protected against destruction among some African clans. For instance, an ant is a totem in some clans in the *Luhyia* community. For them, the ant symbolizes patience, hard work, order and discipline. Members of the community are expected to be active, orderly and disciplined. Any damage caused to an ant-hill or its colony in such communities is equated to endangering the community's welfare. Members of this clan do not eat ants either [37].

6.2. Bee

Figure 11. Bee

Human reliance on insect pollination services continues to increase even as pollinator populations exhibit global declines due to the use of pesticides, disease and habitat loss. Changing temperature and weather conditions due to climate change has also restricted the area where bees can survive. While climate change and other human activities threaten many bees, the bees have received special attention that could help mitigate their threat such as totemic usage. A bee as a totem in some *Tachoni* clans in Kenya symbolizes fertility, riches (the honey of life) and accomplishing the impossible. Members of such clans are expected to make their lives productive to realize their dreams. Destroying forests and flowers, habitats for bees, amounts to killing the progress of the clan which is an abomination that calls for sacrifices to appease the gods [28]. The numerous trees in and around homes are not cut for firewood but are left in their natural state because they are prescribed homes for bees [39].

7. Implications of totems for environmental conservation

Wildlife Conservation

Prohibiting the killing and eating of totemic animals, birds and insects such as ants, crocodiles, leopards and snakes in some communities has helped to conserve and maintain some form of wildlife in the community. It has also helped the animals to survive and multiply in numbers over time despite threats from poaching.

Forest Conservation

Forests that support sacred totemic animals and plants are also protected because they are believed to have special spiritual or cultural values and associations. As a result, harmful activities such as deforestation are discouraged in some communities because it poses a potential threat to the lives of the totemic animals living in the forests and which could cause the wrath of the gods living in them if destroyed. Cutting down forest trees for charcoal in these areas has also been prevented because of the belief

that lesser gods and other spirit beings reside therein. Trees and forests are preserved for posterity, despite increasing threats from modernity.

8. Recommendations

In view of the study findings, it is recommended that:

- Governments, international organizations and private institutions should support the development of educational, research and training centers which are controlled by indigenous communities to allow them to disseminate indigenous knowledge.
- Religious leaders, including pastors, priests, imams and traditional authorities should preach more about the aspects that see human existence as closely tied to its natural environment.
- More research and documentation on the benefits of African belief systems in response to environmental degradation and natural resource conservation should be done along with the root challenges involved.
- The need to integrate modern laws, traditional customs and norms on natural resources conservation and management for the benefit of future generations.
- Documentation of information on IKS should be made public for it to have an influence on local communities and the nation which will in turn help them to develop a positive attitude and perception about IKS in resource conservation.
- Children should be taught totemic beliefs and traditions at the local community level and through the school curriculum so that they can continue to survive; many totemic beliefs and traditions are gradually being lost due to Christianity and modern technologies.

9. Conclusion

The focus of this paper was to explore the significance of indigenous African belief systems: totems in natural resource conservation and management in Africa with special reference to tribes from Kenya and South Africa. Totems have helped to conserve not only the natural environment, but also traditional belief systems. Indigenous African belief systems in the form of totems have contributed immensely and effectively to the reduction in the incidence of wildlife and biodiversity loss. Some plant and tree species, animals and insects are conserved due to their significance to the community as totems. They are treated with reverence and protected for future use due to their sacred value and role in rituals. Totemic animals and plants are maintained mainly through two useful prohibitions: the first against killing and eating the totemic animal and the second against the destruction of plants and their habitats. These traditional belief systems are capable of protecting species biodiversity in particular and the environment in general.

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Lucy Mandillah is a lecturer in the department of Language and Literature Education at Masinde Muliro University of Science and Technology, Kenya. She holds a Doctorate degree in English and Applied Linguistics (2016); a Master of Arts degree in English and Linguistics (2006) and a Bachelor of Education Arts degree in English Language and Literature in English (2002). She is currently pursuing a Post-Doctoral

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Senior Professor G.E. Ekosse is a professor of Applied Clay Mineralogy and Environmental Geology. He is the Secretary General of the African Academy of Sciences (AAS) (2014 to date) and Member of its Advisory Committee on Space, Earth and Environmental Sciences (2014 to date) and its Management Committee and Governing Council. Senior Professor Ekosse is also a life Member of the Geological Society of Africa (GSAf); and Association of Geoscientists for International Development (AGID); Member of the Soil Science Society of Southern Africa (SSSSA), and International Association for the Study of Clays (AIPEA). Furthermore, he is the Deputy Chairperson of Limpopo Research Forum (LRF) of South Africa; and National Research Foundation (NRF); a C2 rated Researcher 2007-2012, 2013-2018. He has won different awards that include the Indiana Black Expo, 1992 and Briscoe Scientific (UK), 1996/1997. Senior Prof. Ekosse is a leader of both Clays and Clay Minerals in Africa and Human and Enzootic Geophagia in Southern Africa Projects. He has authored/co-authored books; book chapters; refereed journal articles; refereed articles in conference/workshop proceedings. He has also organized different scientific fieldwork; workshops, international conferences and symposiums. His research findings have been presented internationally. Currently, he is the Director of Research and Innovation at the University of Venda, South Africa.

Summary

Sustainable development, a development that meets the needs of the present without compromising the ability of future generations to meet their own needs, has eluded most developing nations in the world today. The world's countries inlude the developed and developing nations where most African nations fit into the latter category. Attempts have been made to explain the circumstances under which African countries are striving to develop, but the role of Indigenous Knowledge System (IKS) in the entire process has not been exhaustively explored. Indigenous people have responded to ecological and development challenges by using the cultures and knowledge systems transmitted through their indigenous languages. The aim of this paper was to investigate how totems, as cultural belief systems, have been used in Africa to promote the conservation of natural resources. Qualitative methods (based on literature) were used to explore the values and perceptions that underlie the use of totems. The information was collected by reviewing some literature on African culture and totems from Kenya and South Africa. The literature reviewed concentrated on the cultural symbolism attached to totems among different tribes which were randomly selected from the two countries. Data was analyzed through content analysis and presented thematically. It was found that animal, plant and insect totems in Kenya and South Africa have symbolic meanings attached to them. The symbolic meanings are usually accompanied by taboos believed to have special spiritual and cultural associations. Due to these

cultural associations and taboos, totems are protected against harm by the respective tribes, conserving species diversity and ecosystem diversity. The study recommends that there is a need to appreciate the cultural values and beliefs that help in sustainable development. Findings of the study could add value to the existing body of knowledge on Indigenous Knowledge Systems (IKS) relating to the management and preservation of indigenous knowledge produced in Africa for sustainable development.

Riassunto

Lo sviluppo sostenibile, uno sviluppo che soddisfa i bisogni del presente senza compromettere la capacità delle generazioni future di soddisfare i propri bisogni, oggi è sfuggito alla maggior parte delle nazioni in via di sviluppo nel mondo. I paesi del mondo comprendono nazioni sviluppate e in via di sviluppo. La maggior parte delle nazioni africane rientrano in quest'ultima categoria. Sono stati effettuati tentativi da parte di paesi africani, ma il ruolo del Sistema di conoscenza indigeno (IKS) nell'intero processo non è stato esplorato esaustivamente. Le popolazioni indigene hanno risposto alle sfide ecologiche e di sviluppo utilizzando le culture e i sistemi di conoscenza trasmessi attraverso le loro lingue indigene. Lo scopo di questo lavoro era di indagare su come i totem, come sistemi di credenze culturali, siano stati usati in Africa per promuovere la conservazione delle risorse naturali. I metodi qualitativi (basati sulla letteratura) sono stati usati per esplorare i valori e le percezioni che sono alla base dei totem. Le informazioni sono state raccolte esaminando alcune pubblicazioni sulla cultura africana e sui totem del Kenya e del Sudafrica. La letteratura recensita si concentrava sul simbolismo culturale attribuito ai totem tra le diverse tribù che venivano selezionati a caso dai due paesi. I dati sono stati analizzati attraverso l'analisi del contenuto e presentati in modo tematico. Si è trovato che totem di animali, piante e insetti in Kenya e in Sud Africa hanno significati simbolici a loro associati. I significati simbolici sono solitamente accompagnati da tabù che si ritiene abbiano speciali associazioni spirituali e culturali. A causa di queste associazioni culturali e tabù, i totem sono protetti dalle rispettive tribù, conservando la diversità delle specie e degli ecosistemi. Lo studio ha lo scopo di spingere ad apprezzare i valori e le credenze culturali che aiutano nello sviluppo sostenibile. I risultati dello studio potrebbero contribuire a incrementare il valore del Sistema di Conoscenza Indigena (IKS) relativa alla sua gestione e conservazione per lo sviluppo sostenibile.