

ORIGINAL ARTICLE

Rethinking Cultural and Spiritual Values in Biodiversity Conservation among the Konso People of South-Western Ethiopia

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Abstract

*The concept of biodiversity has a strong link with nature and culture. This study aimed to investigate how the Konso people of southwestern Ethiopia use cultural and spiritual values to conserve biodiversity. The study took place between January to April 2019 and March to July of 2021. Data were gathered using: focus group discussions (9 FGDs), in-depth interviews (with 26 key informants) and observation. A thematic analysis method was employed for analyzing the data. According to the findings of the study, the people of Konso have traditions of using dinna (holy woodlands) as locations for cultural rituals to relate with nature. The dinna's survival is dependent on the clan's leader (poqqola) and the village's chiefs (shorogotta). Cutting of dinna is strictly forbidden because it is believed to result in punishment by the karroytta (deity of dead ancestors). In the Konso culture, cutting the whole shelkata (*Moringa stenopetala*) tree at once is considered as taboo since it is believed that it brought famine to the society. The investigations also found out that modernization and religious organizations have deterred contemporary cultural and spiritual values of biodiversity conservation methods. As a result, collaboration among researchers and policymakers is a critical suggestion for sustaining and integrating traditional forest management techniques with modern forest conservation measures.*

Keywords: cultural values, indigenous ecological knowledge, biodiversity conservation, Spirituality, ethical linkages

Introduction

Nature and culture are inextricably linked entities in traditional worship activities revealing symbolic linkages (Kato 2006; Taylor and Lennon 2011; Smith, 2020). The qualities of this linkage between “nature” and “culture,” according to Singh (2017); Wilkie (1996), are incorporated into the ideas of Burkinabe people who are involved in the use and management of natural ecosystems. Greider and Garkovich (2010) describe the link by claiming that a cultural group transforms the natural environment into landscapes by employing various symbols that impart diverse meanings to the same physical items or conditions. As a result, the connection between nature and culture might be considered as a cultural treasure. This viewpoint, on the other hand, contrasts sharply with World

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DOI: <https://dx.doi.org/10.4314/erjssh.v10i1.1>

Heritage criteria which was originally prepared based on the hegemony of Western values in which cultural heritage was primarily found in great monuments and sites, and in which natural heritage in nature and wilderness was viewed as separate from people (Pretty et al. 2009) (Taylor and Lennon 2011).

Landscapes are not truly 'natural' in the sense that they have been subject to human influence, and it was confirmed that there is great biodiversity to be found in many human-modified landscapes (Phillips 1998). According to Mace, Norris, and Fitter (2012), "biodiversity" is a word that refers to the diversity of life at all levels from genetic to population, species, society, ecosystem, and biosphere. People who are aware of the cultural value of wild plants can play an important role in biodiversity protection (Stevenson 1996; Garibaldi and Turner 2004a; Cocks 2006). Biodiversity as a notion is a potent interface between nature and culture that emerges from a large network of places, and from people through which concepts, policies, and, ultimately cultures and ecologies are challenged and negotiated (Bloch 1991). The findings of many anthropologists and sociologists (Dudley et al. 2010; Berkes 2012a; Alamu 2015) on different communities have shown that commonly owned biodiversity is conserved not only by traditional institutions but also by various cultural elements like kinship, religion, and social organizations.

The protection of biodiversity is significantly improved by cultural and spiritual values. Understanding the environment depends not only on how people and nature interact, but also on how the physical world and the spiritual realm interact (UNEP, 1999; Garibaldi and Turner 2004; Chan, Satterfield, and Goldstein 2012). In terms of biodiversity, the cultural values of indigenous knowledge can improve the socio-economic development of local people. Wilkie (1996) and Berkes 2012; Infield & Mugisha, (2013) noted that people have very different cultures and ethics which included the subjective or relative values of aesthetic and spiritual attachments to landscape and nature. Therefore, this approach to conserving biodiversity based on cultural and religious values is often more sustainable than those based only on legislation or regulation.

Cultural values can be reflected in sacred sites, mythology, and local folklore (Jackson and Ormsby 2017; Amirthalingam 2014). Sacred sites encompass a wide range of natural elements such as built structures, including burial places, sacred groves, sacred forests, mountains, and water bodies (Verschuuren 2010). Sacred forests, sometimes referred to as sacred groves, are sites that have cultural or spiritual significances to the people who live around them. According to Brandt *et al.* (2013); Kent (2013); Campbell (2005); Singh (2017); Dudley et al, (2012), "sacred groves" are "forest tracts that are unaffected by local inhabitants. As a result, they harbor rich biodiversity, and they are protected by local people due to cultural and religious beliefs and taboos which are related to the deities that reside there," Trees produce spear-like forms that fall to the ground. In some locations, sacredness, traditional religious beliefs, and taboos play an important role in supporting the sustainable use and protection of flora and animals (Khan, Khumbongmayum, and Tripathi 2008).

Sacred woods, for example, have protected rare tree species, streams, and temple sites while they are also serving as important biodiversity reservoirs (Khan, Khumbongmayum and Tripathi 2008; Muhando 2005; and Laird 2004). Similarly sacred groves help to conserve biodiversity. On the other hand, some magical animal beliefs and behaviors can harm biodiversity conservation efforts. Malagasy people, according to Holme et al. (2018) view, have a detrimental impact on snake persecution because they believe that snakes can harm humans. Despite the importance of sacredness to conservation, changes in developmental activities and processes of urbanization have influenced

people's attitudes on traditional beliefs, and on taboos which are associated with these ecosystems conservation methods. Therefore, a holistic understanding of the current status, structure, and function of sacred groves and indigenous ecological knowledge systems is essential to assess their ecological role, and to formulate strategies for their conservation.

In Africa, the use of indigenous knowledge systems has greatly contributed to the development of society-based natural resource management schemes (Phuthego and Chanda 2004; Briggs 2005; Kato 2006;2012). This knowledge includes practices such as: the traditional protection of watercourses, certain species of flora and fauna, as well as farming technologies that focus on indigenous food crops. The various forms of protection and farming have contributed immensely to biodiversity conservation (Warren 1996; Gadgil, Berkes, and Folke 1993; Nyong, Adesina, and Elasha 2007). However, the most notable biodiversity conservation practice has been the protection of forests and shrines. In Tanzania, for example, there are traditionally protected forests (Mwihomeke et al. 1998; Blomley et al. 2008), which were established by ancestors for worship. These sacred sites have been protected by the inhabitants following customary laws. As a result, the conservation value of traditionally protected forests can be ascertained through the unique plant and animal species they harbour. Wildlife takes refuge in these forests to escape from forest fires, and from hunters. The protected forests, therefore, play an important role since they serve as habitats for a high diversity of flora and fauna in Tanzania (Myers et al. 2000; Mwihomeke et al. 1998).

In the Ethiopian context, studies indicated that in many parts of the country including the study area of Konso, indigenous knowledge systems and cultural values have been benefiting from environmental protection activities and vice versa (Wondu et al 1999). Indigenous knowledge and know-how and many traditional practices are cost-effective, energy-saving, and environmentally friendly (Assefa and Hans-Rudolf 2017; -Dalle, Mass, and Isselstein, 2006; Dixon 2005). For example, the Konso people are famous for their traditional skills in hillside terracing and banding (Belachew and Mezigebe, 2019). Also in the Bale administrative zone, farmers prepare trenches around potato plots to protect the plants from porcupines. Despite the importance of indigenous ecological knowledge, it is being threatened due to the lack of records and protection of the knowledge. The basic reason for the challenges of the protection of indigenous ecological knowledge is due to the lack of compressive studies on the socio-cultural perspectives on biodiversity conservation among the Konso society (Dalle, Maass, & Isselstein, 2006).

The Konso people's spirituality and modern conservation initiatives encountered conflicting attitudes to ecological sustainability among the different age groups of the Konso people (Watson 2006; Hallpike, 1999). Most of the Konso clan leaders and local elders recognize that all members of their society are united by their common origin and a spirituality that is founded on love and respect for nature (Otto, 2004). Their knowledge is practical and collective, and it is directly linked to people's daily lives of agricultural activities. For long times, people acknowledged and respected their clan leaders, and their local elders since they considered them as carriers of knowledge and history, and they reminded their importance of conserving and preserving their own culture and history. However, as a result of the influence of modernization and urbanization because of globalization, today's youth are lured to foreign fads rather than their own cultural and spiritual heritages. Ecological information has been passed down from generation to generations and from family and society by word of mouth. Therefore, the current study aimed to document the cultural and spiritual values of the Konso people for biodiversity conservation, and to identify challenges to the sustainability of cultural values of biodiversity conservation,

and to make the information readily accessible to policymakers.

Materials and Method

Study area

The study was conducted in the Konso Woreda, southwest Ethiopia. The name “Konso” refers to both the people who live there and the Woreda. Konso is one of the 56 ethnic groups of the southern nations, nationalities, and peoples of southwestern Ethiopia. Konso district is located about 595 kilometers southwest of Addis Ababa, the capital city of Ethiopia, and 360 kilometers from the regional capital, Hawassa. The topography is characterized by high plateaus which are topped by hills and mountains. In addition, it covers a total area of 2974 sq. km, and it lies between 5° 09’ 50” to 5° 38’ 53” N latitude and 37° 0’ 20” to 37° 41’ 31”E longitude with altitudes which range from 650 to 2650 m above sea level (Mulat 2013; Tadesse 2010) (see Figure 1).

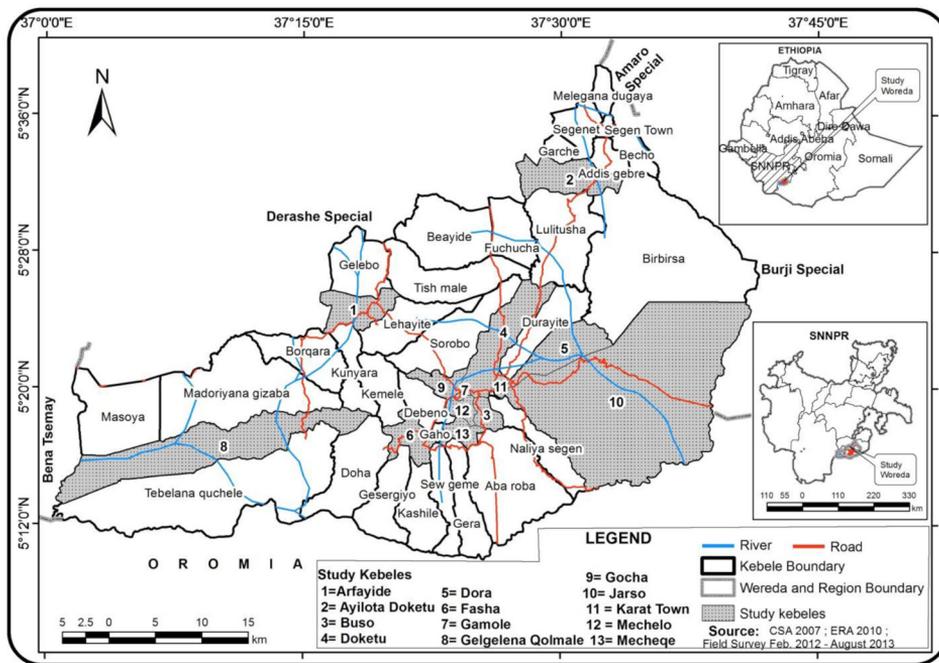


Figure 1: Map of the Study Area (CSA, 2007)

According to the census which was done in 2007, the population of Konso was 234,987 of which 113,353 (48.2%) were males, but 121,634 (51.8%) were females. Similarly, 90% of the rural population was farmers (CSA, 2007). The Konso people are categorized into nine patrilineal and exogamous clans (*kaffa*), which are settled in various villages (Demeulena, 2002; Otto, 2004).

Like all other local communities, the *Konso* society has indigenous knowledge which is important for their survival (livelihood). This indigenous knowledge are environmental conservation and sustainable development. The Konso people are well known for their indigenous land management specifically which is related to forest and soil management.

Many parts of the Konso highlands are covered by a series of traditional terraces that are built across the slopes to protect the soil (Tadesse 2010; Watson 2006; Hallpike, 1999). Along with terracing, farmers practice: crop rotation, fallowing and tree planting on their farm fields. Drought tolerant plants, such as *Moringa stenopetala*, are extensively used which makes the area one of the least affected by the recurrent drought in Ethiopia (Tadesse, 2010). Indigenous environmental knowledge systems have also played a pivotal role in maintaining and managing forests (Tadesse 2010; Hallpike, 1999).

The natural vegetation of Konso Woreda is largely grasses, residual woods and trees on the highlands while dry bushes and shrubs cover the lowlands (Farm Africa, 2001). In Konso, the Moringa tree which is often known as the cabbage tree, and the *Oeypatta* (*Terminalla brownie*) trees are plentiful.

Study design

The study was carried out between January to April 2019, and March to July 2021 in the Konso district. The study employed an ethnographic research design. The different types of information which are related to perceptions of local knowledge, cultural values of environmental conservation systems and personal meanings of sacred forests were collected during ethnographic fieldwork.

Data collection methods and Instruments

Data were collected using semi-structured in-depth interviews, focus group discussions (FGD) and participant observations. The in-depth interviews were one of the most important data-gathering techniques in which the research problem was described, and it was put into a larger socio-cultural context. The researcher conducted in-depth interviews to 26 key informants. The participants include: 3 clan leaders (*Poqqolla*), 3 village chiefs (*Shorogotta*), 4 high school students, 4 religious leaders, 4 local elders and 8 society members. All of them, in one way or the other, had direct life experiences to in-depth interview, and they had good understandings to the issue of cultural and spiritual values of biodiversity conservation methods. In-depth interviews were conducted to groups of research participants who were selected from both genders, and with different ages as well as different occupations, residential, and educational statuses. These key informants were interviewed about their views of clan systems, cultural roles in environmental conservations, and sacred forests. The remaining 7 key informants came from other occupational groups, mostly teachers, agriculture bureau officers, and agriculture development agents. You didn't mention specific number and specific occupation in the above sentences, but you mentioned in this highlighted sentence. Please make adjustment to either of them. I initiated the discussions for each of the key informants by asking questions using different interview checklists, and the interviews were also recorded with the consent of the interviewees.

In-depth interviews provided informants with the opportunity to explain their experiences and behaviors which are related to cultural values of environmental conservation and sacred forests. They encouraged people to talk freely about their personal feelings, opinions, and perceptions. As a result, they facilitated our understanding of the meanings of symbols, ritual interactions, and personal meanings of sacred forests. This method enabled me to understand knowledge-related issues which existed between culture and nature preservation among Konso communities.

Throughout the fieldwork, the researcher also conducted systematic observation of occasions, practices, and activities using checklists prepared for the study at hand. In the same way, he observed the physical and biotic environment, public centers (*mora*), farmlands, sacred forests, graveyards, grove areas, and village compounds to understand the social relationships between the people, and the clan leaders in the traditional environmental conservation system. Field observations were memorized as mental notes, and they were recorded by taking photographs for later recall. Field observation of the day-to-day activities of the people helped the researcher to contextualize how the participants perceived, and how they conceptualized environmental conservation and its values.

Focus group discussions (FGDs) were other data collection methods which were used in this study. A total of 9 FGD sessions were held in three villages of Konso namely Gamole, Buso, and Gocha for mixed-gender groups which were grouped based on common interests, and common experiences using the FGD guide which was prepared for discussants. At the 9th FGD session, the data collection reached at a saturation level, and a decision was made to stop the FGDs. The 9 FGD groups were differentiated by age (elderly men and women and younger men and women) and occupation (religious leaders, peasants, community leaders, and agricultural development agents) because these groups are believed to have good knowledge on the discussion issue. . The FGDs discussions were held to grasp the different and shared attitudes and perceptions of the participants concerning the perceptions of cultural values for environmental conservations, and concerning the use of environmental preservations. The FGDs were also instrumental in the triangulation of the data to get a broader understanding of challenges that Konso people faced about cultural values for environmental conservation. This method helped the researcher to get further elaboration, and to exemplify issues that have been raised by the other data gathering methods. Our prior exposure to people during the informal interviews and discussions made the recruitment of FGD participants easier.

Method of Data analysis

A proficient interpreter in both languages translated, and transcribed the interviews from *Konsogna* into Amharic. The researcher's command of the language is not as good as that of native speakers. As a result, he enlisted the help of a native research assistant who could serve as an interpreter while the researcher was there. Consequently, it appears that data quality assurance is primarily reliant on interviews and focus groups. This means that rather than being acquired using only observation, the data is based on self-reported assessments of values and behaviors. The various categories were then used to code the transcription for each participant's response.

Subsequently, transcriptions and coding were translated into English by a third independent coder who was familiar with the research objectives to ensure the reliability of the codes. Thematic codes were given during the analysis of explanations for the roles of cultural values in environmental conservation to identify the challenges of traditional biodiversity conservation systems. Therefore, various themes were identified based on issues such as the relation between cultural values and environmental conservation, perceptions about sacred forests, values of environmental conservation and perceived changes and challenges of local knowledge for the environmental management system. Differences in the initial analyses could be resolved, and the different categories agreed upon. Thematic analysis was then employed to analyze, and at the same time to synthesize the main topics of categorized data. This method helped to identified systematic patterns

among categories. It also helped me to better comprehend the symbolic meanings attached to the different cultural values and local environmental knowledge of the people in the study area.

Data quality assurance

The different data gathered helped me to understand human environmental views, and to elucidate the emic or insiders’ perspective rather than focus merely on the etic or outsiders’ perspective. I used different criterion to assure the quality of the qualitative data. Some of the criterion include: trustworthiness, credibility, and conformity. Furthermore, triangulation with multiple sources of data collection methods helped me to enhance the validity and reliability of the data. Likewise, I also tried to ensure the credibility and representativeness of the research findings through the confirmation of knowledgeable research participants, and through the use of language interpreters. Therefore, it was possible in the end to ensure that this interpretation would correctly reflect the research participants’ perceptions of local knowledge and cultural values of environmental conservations.

Conceptual Framework of the Study

The roles of cultural values and indigenous ecological knowledge in keeping sustainable biodiversity conservation articulated the environment as a cultural idiom linking spiritual beliefs and ecology. The conceptual framework of the indigenous ecological model depicted in Figure 4 below presents the overall contributions of cultural and spiritual values to biodiversity conservations in Konso. It is used as a road map to answer the research questions, and it helped to analysed the data.

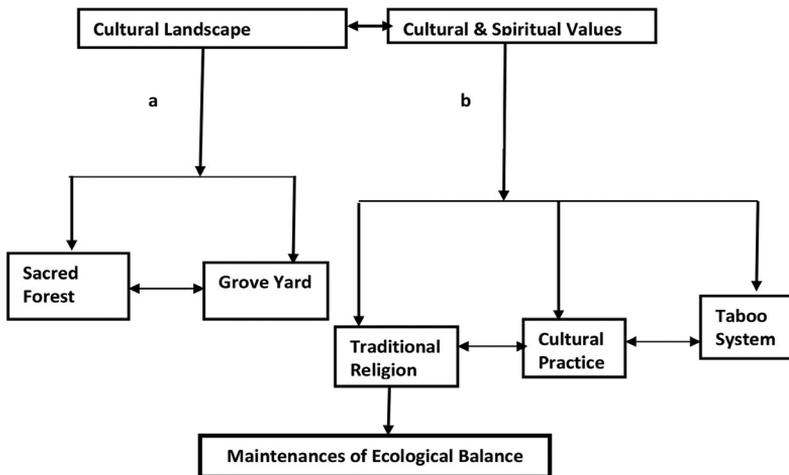


Figure 2: The conceptual framework of an indigenous ecological model that illustrates the roles of cultural and spiritual values for keeping biodiversity conservation (Source: Own Model based on literature review)

The conceptual framework demonstrated that the systematic relationships and influences which existed among the three components including: (a) cultural landscape (sacred forest and grove yards), (b) cultural values, and spiritual values (taboo systems, traditional religion and cultural practices), Thus, a combination of all these components would positively influence the maintenance of ecological balance leading to biodiversity conservation. This framework also revealed the local conceptions and practices of biodiversity conservation, and it depicted the influencing factors with the integration of the modern environmental management systems and policies for effective and sustainable biodiversity conservation.

Results of the study

Beliefs about sacred forests and cosmology

Many people in Konso have beliefs and traditions which are related with the sacred forests and/or groves locally known as *dinna*. Regarding to this, a 72 years-old male informant in Ollanta village states that:

... 'dinna' is the site of rituals to bring rain during the drought season that is thought to be related to the breaching of local customs. 'dinna' is also the site of our 'karroytta' (dead ancestor's) spirit and a place where 'poqqalla' (the clan leader) is believed to communicate with their 'karroytta'. The poqqalla always pray about rain, and about our goodwill in the 'dinna'. As a result, we respect it, and no one is affecting it.

The *poqqalla* usually communicates the spirit and natural worlds through symbolic rituals. Informants specifically explained that the *poqqalla* communicates forest trees with spiritual and supernatural phenomena, and as a result, they are symbols of the spiritual world of ancestors. Villages often contain large reserves of *Moringa stenopetala* for the performance of local rituals for different purposes. Concerning this, for example, a female informant pointed out that:

When we encountered 'paaqa' (illness) and 'diriqqa' (drought), we use the branches of 'shelqahta' tree to be blessed waaqa or 'karroytta' (the ancestors) so that to keep the problems far away from us because we believe that 'karroytta' and 'oretta (evil spirits) inhabit the 'shelqahta' tree....[a 53 years old Female participant, Gocha Village].

Similarly, data which were obtained from in-depth interviews and observations also indicated that society burial sites are typically distinguished by thick groves of indigenous trees, and by natural vegetation including a variety of mammals and birds. During my fieldwork, I was able to visit one of the *Poqqalla* forests at Gamole, known as the Kalla forest which belongs to Kalla Gezahagn Wolde/Dawit. As it is sacred, and it is untouched by the people, it is still in relatively good condition as shown in the picture below.



Figure 3: The picture shows Konso's sacred forest and/or grove (Picture courtesy: T. Workneh, March 2019)



Figure4: The picture shows Konso's sacred forest and/or grove (Picture courtesy: T. Workneh, March 2019)

The Konso believed in the power of *karroytta* ('dead ancestors') spirits whom they believed that they are assisted by deities. To them, spirituality respects nature. It is believed that cutting trees is regulated by the dead ancestors' deity who discourages the cutting of forests. Focus group discussion data revealed that if someone cuts an indigenous tree from the sacred forest where the spirit is believed to reside, the perpetrator may encounter bad fortune. It is also asserted that deforestation and bush burning are strictly forbidden and punishable by the deity. Research participants of FGD discussants also explained that the *poqqalla* act as priests. They frequently perform different rituals for their *waaqa* (god), and they beg (pray for) the *waaqa* to protect the people from various catastrophes. The *poqqalla* has the role of guarding of the local environment and traditions. This is explained by one of my key *poqqalla* informants as follow:

'Karroytta' (dead ancestors) are believed to have continued influence over the living members of their immediate kinship unit. Their influence can be positive or negative depending on the conduct of the living. The 'karroytta' is believed to be the proprietors of the land, and they are responsible for promoting the fertility of beings and that of the earth and the growth of crops. Hence, we, the poqqalladda have a responsibility to pray, and to do rituals to the spirit to live in harmony. [A 47 years-old poqqalla in Gamole village]

Similarly, the valuing of sacred forests and groves designates a long tradition of environmental conservation. The Konso people's cosmology promotes values that support conservation, and they discourage values and ethics incompatible with sustainable ways of life. Interviews conducted with a Gamole village *poqqalla* (clan leader) revealed that each *Poqqalla* has an *omuziro* (totem) which may be an animal, insect, or plant, and it is forbidden to eat one's *omuziro*. This ethical stand thus places a responsibility on each clan member to promote ecological sustainability through the protection of totems against harm and destruction.

Indigenous Agro-ecological knowledge

The Konso people have in-depth indigenous ecological knowledge about how to conserve, and how to develop agroforestry. I observed that different people in Konso perform different roles like as gatherers, gardeners, plant breeders, and effective custodians of seed and indigenous agro-ecological knowledge. Data from observations showed that the Konso people practice mixed farming growing two or more crops in proximity (intercropping techniques) to preserve soils, and to produce drought-resistant crops. They produce different crops such as: maize, haricot beans, pea, and beans in one plot land of their farm simultaneously, and they produce sorghum and chickpeas in other pieces of their farm land. Data obtained from farmers' FGD discussants revealed that compost or organic manure is used to improve soil fertility as an important fertilizer. The compost is prepared from a mixture of plant remains such as: cow dung and urine, and chicken droppings. The Konso notion of the *mura* (forest) has important implications for natural resources and/or biodiversity conservation. According to FGD participants, the Konso people are known not just for their terracing practices but also for their effective agroforestry activities. They grow trees including *Moringa stenopetala*, coffee, papaya, and various types of vegetables in the same unit of land as their homestead. These trees give shade for coffee, and they improve the micro-climate of the local environment, and the soil fertility by fixing nitrogen. Organic materials such as leaves from the trees can also enrich the topsoil. Like other ethnic groups in Ethiopia, people in Konso recognize that trees give stability to their land. Moreover, trees support the eroded landscapes by protecting the watershed deep area in the ground from washout by flood, and they facilitating water infiltration. A 34-year-old farmer who was a key informant explained that this concept as "*We are always planting trees on our farm, and we are aware that without forestation the terracing activities would not have been possible*".

The Konso people also have a long history of forestation and forest preservation practices. They plant and preserve various trees such as *oeypatta* (*Terminalla brownie*), *shelqahta* (*Moringa Stenopetala*), *Juniperus procera*, and *Accia abyssinica* in their farmland, and gardens. The researcher's observations indicated that the *shelqahta* tree is abundant and it commonly grown in Konso, and it has a significant level of socio-cultural and ecological value attached to it. About this, a 59 years-old man who was a key-informant in Ollanta village asserted that:

“The ‘shelqahta’ is the gift of waaqa’s tree to the Konso people, and we give special respect to the tree. It is our stable food. The ‘shelqahta’ tree lives for a long time without being affected by drought, and it can be easily grown.”

In the Konso culture, cutting or removing part of the *shelqahta* tree from the stem, and uprooting the seedlings are believed to be taboo. It is only permissible to cut the branches and leaves. Focus group discussions indicated that cutting the whole part of the tree will bring famine and bad fortune upon the society at once. Because of this, when they harvest *Moringa stenopetala* leaves and/or collect parts of the tree, precaution is taken to save the life of the mother plant. Although the climatic condition of Konso is getting drier, the *shelqahta* tree has the potential to increase moisture and water supply to the environment. It was also observed that because of its massive leaf production, *shelqahta* produces organic matter, and it recycles soil nutrients. This, in turn, not only serves socio-cultural functions in the society but also makes special contributions to balancing the biodiversity of the environment.

Observations also indicated that Konso farmers practice local-based agroforestry techniques. According to FGDs that include agriculture development agents, the Konso people are known not just for their terracing practices but also for their effective agroforestry activities. People in Konso recognize that trees give stability to their land, and they support the eroded landscapes by protecting the watershed deep in the ground and facilitating water infiltration. It is repetition. This view of how terracing and agro-ecology have been practiced is vividly illustrated by the following figure:



Figure 5: The pictures shows Konso people’s ecological knowledge of terracing and agroforestry practices (Picture courtesy T. Workneh, March 2019)

According to FGD participants, local communities including the shorogotta, (village chiefs) have acted as the guardians of the pitta (environment) and /or biological diversity. The shorogotta are also responsible for protecting the mura (forests) or communally owned forests, constructions, conservations of communal water ponds, and maintenance of roads and terraces. Field observations show that most people plant different seedlings in their farmlands in addition to preserving their dinna (sacred forests) around the village. Farmers were also consulted by the shorogotta on how to harvest crops on their agricultural lands. Among the different traditional institutions in Konso which are assigned to play different roles, responsibilities, and have power to the youth based on their age category called xelta led by shorogotta is the prominent social institution that protects and conserves the environment including public forests although its power and function have diminished over the past decades due to the influence of modernization because of urbanization and expansion of modern education.

The current challenges of biodiversity conservation

Data obtained from in-depth interviews indicated that the spread of Protestantism Christianity and Islam in Konso changed the traditional beliefs about environmental conservations which resulted in a unification of culture. This is mainly because the doctrine of such sectors is in contradiction with the traditional beliefs such as believing in water and frost sprits. 71 years-old man in Dokotu village states the impact of Protestant religion on the sustainable cultural values of biodiversity conservation as:

Currently, our connection with waaqa (god) and the spirits of 'karroytta' is becoming lost. Due to this, rain is not coming at the right time, and crops are not productive. Our spiritual values are being eroding. We are losing several gifts of nature including indigenous plant species, birds and mammals, streams, and rivers. For example, 'mura' including from some sacred forests are indiscriminately being cut down for construction purposes, and animals are also lost by illegal hunters. This is mainly due to the impact of religion on our traditional belief for keeping 'dinna'. Previously, people did not cut trees from the 'dinna' because they respect the spirit attached to the forest. However, now, the Protestant doctrine is preaching to their religious followers that not to practice the traditional beliefs and rituals of the 'karroytta' and they considered it a sin. Thus, our children are influenced by the effect of globalization. They become resistant to our tradition, and the belief system of conservation.

According to the observation data, Christian converts regard indigenous values as incompatible with their new religious faith. Local customs and values are not honored according to the majority of FGD participants, due to the influence of culture change resulting from increased urbanization and changes in people's lifestyles as well as the expansion of the Christian faith. This, in turn, challenges the practice and transfer of indigenous ecological knowledge. For example, a clan leader noted it as follows:

At this time, due to the expansion of Christianity in Konso, different customs, traditional and ritual practices are being gradually eroded, and they are disappearing. Many people especially the young generations have neglected their ancestors' traditions and cultural values. After most people had changed their religion from traditional dogmas to Christianity, they have largely discouraged practicing traditional ritual undertakings. Similarly, the banning of divination has reduced the use and protection of ritual sites. [A 41 Male participant from Gamole Village, May 24, 2018].

Focus group discussants in Buso village also revealed that as a result of the spread of modernization and modern religion, Konso identity and traditions are partly eroded. Furthermore, 46 years-old man who is a key-informant stated in relation to the hegemony of science and modern education explained that: *"Because of the negative attitudes of educated persons towards indigenous knowledge, elders pass away without transferring their deep knowledge. Modern agriculture professionals do not want to share and integrate our indigenous knowledge with their modern environmental management systems."*

The other biodiversity pressure mentioned by in-depth interviewees with the agricultural development agents and local elders indicated that there are problems of lack of grazing land for their domestic animals due to agricultural land expansion as a result of popula-

tion pressure. The other challenge is that the farming communities focus on the short-term benefits like the production of food, food for their livestock, and planting fast-growing trees like the Eucalyptus tree instead of the indigenous ones for construction and firewood. Hence, the holdings of the farming society including the communal lands are severely degraded, and devoid of diverse tree species in some parts of the region.

Discussion

The study found that like in other parts of the world, the Konso has a strong belief about connection between human beings and nature. This is also reported by Hallpike (1999) and Otto (2004) who contended that many Konso people continue to believe in their cosmology (the nature of the Konso universe) which is perceived to be presided over by their ancestors. According to these scholars, people continue to practice and believe in the rituals of their ancestors throughout their lives because they believe that it defend them from calamities and catastrophes even after they convert from their traditional religion to Christianity. The Konso worldview was, therefore, symbolically inherited in their day-to-day lives. Everything begins in nature, and it ends with the natural environment according to the society's worldview: "We seek permission from the forest for getting rain and well-being (Orr, 2002). The society refers to the "forest" here as a symbolic intermediary of the supernatural world to the people. Thus, the Konso worldview and beliefs have direct relations with their cosmology and the environment.

The current study and those studies conducted by Otto (2004) and Hallpike (1999) indicated that the three categories of the Konso worldview of the universe include waaqa (the sky/heaven), pita (the earth), and pitakela (the underworld). Such categories portray how Konso people 's belief systems and worldview of their origin are directly related with the environment. Apparently, among the Konso society, waaqa is seen as the source of rain, honesty, justice, harmony and well-being. On the other hand, waaqa also punishes people for breaking cultural rules such as cutting trees from sacred groves. Therefore, the study implies that cosmologies have a direct link to the perception of the people towards the spiritual and cultural values for biodiversity conservation.

Similarly, Berkes (2012) and Daszak, Cunningham, and Morand et al (2018) noted that approaches to conserving biodiversity that is based on cultural and spiritual values are often more sustainable than those based only on legislation. Geertz (1973) defines "culture" as "The knowledge and values shared by a particular society, and it is a set of control mechanisms, plans, recipes, rules and instruments for the governing of behavior." On the other hand, "values" and "beliefs" are standards and principles for judging worth (Halstead, 2014). These results corresponded with similar studies which were conducted in traditional societies all over the world. They revealed beliefs about cosmology which involved the conservation of biodiversity (Gao et al, 2013; Cotton and Wilkie 1996).

In related to the Konso cosmology, the study identified various indigenous beliefs and practices. Some of the old trees in the sacred forest are believed to have the spirits of dead ancestors. According to the information which was gathered during interviews, the sacred woodland is a home to a variety of spirits like the spirits of the poqqalla ancestors. Another study which was conducted in India supported this finding stating that sacred forests were used as spiritual retreats, and as settings for ritual rites (Posey 1990; Mgu-mia & Oba 2003; Laird 2004b). According to Holmes et al. (2018), beliefs and behaviors that are related to magical animals can have both positive and negative effects on biodiversity conservation methods. For example, according to Holme et al. (2018), Ethiopian hyenas have been maintained due to the belief that hyenas perform an ecological func-

tion by consuming evil spirits. However, Malagasy snakes have been hunted down since it is believed that they poison trees by transforming into sharp spear-like forms, and by dropping it. The current study confirmed that most of the Konso ritual practices are performed by the ancestors. The few remaining ritual sites in Konso are cemeteries and sacred forests. These are not only guaranteeing the preservation of cultural and spiritual values among society members, but they are also facilitating networking and integration for society-based development activities. As a result, the sites continue to be forested for environmental preservation. The ancestral rituals and activities, therefore, have shaped the Konso understanding of environmental sustainability and biodiversity conservation.

In the same way, the study also revealed that the Konso people believed that 'drought' and 'disaster' are directly related to contempt against traditions and customs. This violation against tradition makes ancestors unhappy. It prompts them to intervene by inflicting mystical anguish on those who violate the regional customs. Traditionally, the existence of restricted areas or sacred forests protects certain sections of forests, rivers, and streams. There are no hunting and cutting practices of trees in such reserved areas without the awareness of the poqqalla. The Konso poqqalla plays a pivotal role in transforming of their priceless cultural values, taboo systems, and traditions to the succeeding generations about sustainable environmental conservation.

Konso people's local beliefs and taboo systems play indispensable roles in biodiversity conservation practices. In Konso culture, for instance, cutting or removing the shelqah-ta tree from the part of its stem is seen as taboo. Thus, it can be argued that people in Konso give cultural respect and meaning to the *Moringa stenopetala* tree. Such cultural taboo practices guide Konso people's perception of the plant, particularly in the context of cultural values. This implies that Konso's cultural-ecological values in turn have significance for biodiversity conservation. Seemingly, it is possible to note that for the Konso, all the cultural and ritual practices of the *Moringa stenopetala* tree are directly related not only to observable phenomena, but also to the manifestations of unobservable causative forces, agents, and beings. The visible or ordinarily perceptible aspects of *Moringa stenopetala* trees revealed certain important aspects or qualities of the embodied and invisible symbolic meanings. It is, therefore, fair to conclude that Konso people's cosmology as well as their socio-ecological worldviews are directly related profoundly with the conservation of the environment.

The recognition of indigenous ecological knowledge systems is a well-tested coping mechanism for biodiversity conservation (Posey 1990; Warren 1996; Mwaura 2008; Gao et al, 2013; Mekonen, 2017). The results of this research are aligned with other similar studies in showing that the Konso people largely employed their indigenous ecological knowledge to harmonize their livelihoods with the prevailing ecological and climatic conditions. People in the study area have created adaptive strategies for environmentally friendly terracing and moisture and soil conservation systems. Although the dry climatic conditions challenge their efforts, they keep bio-diversity by forestation, and by the cultivation of crops that are suitable for this harsh environment.

In the same way, different villages in Konso have large reserves of cactus which is used as fodder, and as forming an important firebreak. This result was in line with a similar study which states that the Konso society is endowed with rich indigenous agro-ecological knowledge (Tadesse 2010; Mulat, 2013) and that the decision of farmers to grow trees is influenced by various factors, and it involves adjustments of resources. This implies that tree planting on private farmlands should match and support farmers' livelihood strategies. Understanding indigenous knowledge about traditional cultural environmental

conservation methods might, therefore, enable environmentalists to use this timely useful knowledge to a more effective modern biodiversity management.

However, the current findings also showed that rapid socioeconomic changes, and other related factors of modernization have tremendously challenged the efforts of Konso farmers of the indigenous ecological practices used for biodiversity conservation. Similar study results indicated that the spread of modernization and religious doctrines such as Christianity by the Konso people partly influenced the young generation's perceptions about themselves, and about the environment (Tadesse 2010; Watson 2006; Hallpike, 1999).

As a result, although the traditional belief systems of the Konso people are more useful than just a religious certainty, their identity and traditions have been greatly eroded. The current finding revealed that contemporary religious institutions especially Protestant sects, have harmed the traditional and spiritual contributions of Konso sacred forest preservation methods, and their direct influence on the perceptions of the younger generations about the traditional way of environmental conservation. This is also highlighted by the research findings of Hallpike (1999) and Watson (2006) which states that conversions to Christianity from traditional religion have affected local identities and indigenous-based environmental preservation methods among the Konso. However, according to Mgaya (2020) the more youths were exposed to modernity, and the more they interacted with different cultures, the more they developed blended perceptions and behaviors, and consequently they disregarded the sacred groves' traditions.

To some Bena people in Tanzania, the rise of Christianity and modern education do not fully explained the younger generation's skepticism about traditional forest rituals. For instance, most sacred forest priests interviewed pointed out that traditional religion did not contradict with Christian teachings particularly regarding respect to nature. Furthermore, the study indicated that because of the influence of "modernization," many Konso cultural values such as self-respect and hospitality have been eroded. Youths are increasingly changing their behaviors, and they do not respect to each another. As a result, there is a decline in obeying elders or seniors for terracing maintenance, and for environmental preservation. The study generally elucidated that socio-cultural factors such as the change in way of life, formal education, religion, and lack of proper documentation mechanisms played roles in affecting the indigenous ecological knowledge transfer systems among the Konso people.

Conclusions

The current study indicated that the traditional cultural and spiritual values of the Konso people have been contributing to the sustainable conservation of biodiversity. Similarly, the cultural and spiritual values of the Konso people also created society integration and awareness to enhance indigenous biodiversity conservation. Some of the local bylaws of the Konso society are: the sorogotta (the local chief) has a responsibility to cooperate the youth, and to maintain the destructed terraces. Local bylaws and rules concerning access and rights to extraction may constitute conservation strategies for biodiversity. For example, the sacred forests and groves in many parts of Konso ensured that some forests are preserved. These sites are often found in areas where they protect the watershed, or where areas which are likely to be subject to severe erosion. These protected sites also ensured that reserved forests and shrines have remained important protected places which harbor different fauna and flora species thereby maintaining biodiversity in the different villages of Konso.

Moreover, the Konso indigenous ecological knowledge systems have positive impacts on the relation between human culture and nature. The Konso people give much consideration to the sustainability of plants and agroforestry activities to acquire food, and to preserve biodiversity. In Konso, it is believed that biodiversity losses not only entail a loss of biological resources, but they may also involve a loss of cultural practices as their spiritual values are perceived to be embedded within the forests. The Konso people have kept the forests intact in the vicinity of their villages. As a result, culture plays an important role in the conservation and sustainable use of the environmental resources among the Konso. This has resulted in a wider sense of conservation for natural habitats, and for ecological services. In the Konso tradition, graveyards and/or sacred forests are related with the concept of a “presiding deity” and these deities are associated with the dead ancestors of poqqalla. Protected areas in the form of sacred groves are also important for the conservation of plant and animal species. Thus, making partnerships with local and indigenous groups offer opportunities for strengthening biodiversity conservation.

However, from the current study, it is also possible to conclude that the changes in socio-cultural values which come through modernization, education, and religion over time have led to the weakening of local cultural and spiritual values. Therefore, they have effects on the indigenous ecological knowledge transfer systems in the study area. The local government, therefore, should have awareness, and it should promote the roles of the Konso indigenous ecological knowledge for biodiversity conservation. Likewise, there is also a need to integrate the Konso indigenous ecological knowledge into the school curricula across all levels. Indigenous ecological knowledge needs to be reflected in students’ wildlife and environment clubs as well as in activities of student unions. Not only these, but there should be collaboration among clan leaders, researchers, and policymakers since it is significant to maintain, and to integrate such customary practices with modern methods of forest conservation and to ensure continued biodiversity.

Acknowledgments

I would like to thank the University of Gondar for providing me with study leave for this research work. I have a special acknowledgment for Mr. Addisu Kechacha, my research assistant and field guide without whose role the fieldwork would have been impossible. I am also deeply grateful to all participants of the focus groups and to the in-depth interviews participants for sharing their knowledge. Last, but not least, my cordial thanks go to the staff of the Konso district administrative, and to culture and tourism offices for kindly facilitating the administrative processes for the fieldwork.

Declaration of Conflicts of Interest

The author(s) declared that there are no potential conflicts of interest concerning the research authorship of this article.

Competing interests

The author declare that he has no competing interests

Abbreviations

IEK: Indigenous Ecological Knowledge; FGD: Focus group discussion

References

- Alamu, A. G. (2015). Traditional Religion, Sacred Places, and Sustainability in Africa: The Role and Contribution of Sacred Places in Nigeria. *Harnessing Cultural Capital for Sustainability: A Pan Africanist Perspective*, 174-175
- Assefa, E., & Hans-Rudolf, B. (2017). Indigenous resource management practices in the Gamo Highland of Ethiopia: challenges and prospects for sustainable resource management. *Sustainability Science*, 12, 695-709.
- Assefa, E., & Hans-Rudolf, B. (2017). Indigenous resource management practices in the Gamo Highland of Ethiopia: challenges and prospects for sustainable resource management. *Sustainability Science*, 12, 695-709.
- Berkes, F. (2012). Sacred Ecology, Routledge. *New York & London*.
- Bloch, M. (1991). Language, anthropology and cognitive science. *Man*, 183-198.
- Blomley, T., Pfliegner, K., Isango, J., Zahabu, E., Ahrends, A., & Burgess, N. (2008). Seeing the wood for the trees: an assessment of the impact of participatory forest management on forest condition in Tanzania. *Oryx*, 42(3), 380-391.
- Brandt, J. S., Wood, E. M., Pidgeon, A. M., Han, L. X., Fang, Z., & Radeloff, V. C. (2013). Sacred forests are keystone structures for forest bird conservation in southwest China's Himalayan Mountains. *Biological Conservation*, 166, 34-42
- Briggs, J. (2005). The use of indigenous knowledge in development: problems and challenges. *Progress in development studies*, 5(2), 99-114.
- Campbell, M. O. N. (2005). Sacred Groves for forest conservation in Ghana's coastal savannas: assessing ecological and social dimensions. *Singapore Journal of Tropical Geography*, 26(2), 151-169.
- Chan, K. M., Satterfield, T., & Goldstein, J. (2012). Rethinking ecosystem services to better address and navigate cultural values. *Ecological economics*, 74, 8-18.
- Cocks, M. (2006). Biocultural diversity: moving beyond the realm of 'indigenous' and 'local' people. *Human Ecology*, 34(2), 185-200.
- Colding, J., & Folke, C. (2001). Social taboos: "invisible" systems of local resource management and biological conservation. *Ecological applications*, 11(2), 584-600.
- Cotton, C. M. (1996). *Ethnobotany: principles and applications*. John Wiley & Sons. CSA, 2007. "Population Census of Ethiopia: Central Statistical Authority of Ethiopia. Ethiopia: Addis Ababa."
- Dalle, G., Maass, B. L., & Isselstein, J. (2006). Encroachment of woody plants and its impact on pastoral livestock production in the Borana lowlands, southern Oromia, Ethiopia. *African Journal of Ecology*, 44(2), 237-246.
- Daszak, P., Cunningham, A. A., & Hyatt, A. D. (2001). Anthropogenic environmental change and the emergence of infectious diseases in wildlife. *Acta tropica*, 78(2),

103-116.

- Dixon, A. B. (2005). Wetland sustainability and the evolution of indigenous knowledge in Ethiopia. *Geographical Journal*, 171(4), 306-323
- Dudley, N., Bhagwat, S., Higgins-Zogib, L., Lassen, B., Verschuuren, B., & Wild, R. (2012). Conservation of biodiversity in sacred natural sites in Asia and Africa: a review of the scientific literature. *Sacred natural sites*, 45-58
- Gao, H., Ouyang, Z., Chen, S., & Van Koppen, C. S. A. (2013). Role of culturally protected forests in biodiversity conservation in Southeast China. *Biodiversity and Conservation*, 22, 531-544
- Garibaldi, A., & Turner, N. (2004). Cultural keystone species: implications for ecological conservation and restoration. *Ecology and society*, 9(3).
- Geertz, C. (1973). Chapter 1/Thick Description: Toward an interpretive theory of culture. *The interpretation of cultures: Selected essays*, 3-30.
- Greider, T., & Garkovich, L. (1994). Landscapes: The social construction of nature and the environment. *Rural sociology*, 59(1), 1-24.
- Hallpike, R. 1999. *The Konso of South-Western Ethiopia: A Study of the Values of a Cushitic People*. 2nd ed. Oxford, Clarendon Press.
- Hallpike, R. 1972. *The Konso of South-Western Ethiopia: A Study of the Values of a Cushitic*
- Halstead, J. M. (2014). Values and values education: Challenges for faith schools. *International handbook of learning, teaching and leading in faith-based schools*, 65-81.
- Holmes, G., Smith, T. A., & Ward, C. (2018). Fantastic beasts and why to conserve them: animals, magic and biodiversity conservation. *Oryx*, 52(2), 231-239.
- Huntington, H. P. (2000). Using traditional ecological knowledge in science: methods and applications. *Ecological applications*, 10(5), 1270-1274.
- Infield, M., & Mugisha, A. (2013). Culture, values and conservation: a review of perspectives, policies and practices. *Fauna & Flora International, Cambridge UK*, 2.
- Jackson, W., & Ormsby, A. (2017). Urban sacred natural sites—a call for research. *Urban Ecosystems*, 20(3), 675-681.
- Kato, K. (2006). Community, connection and conservation: Intangible cultural values in Natural Heritage—the case of Shirakami-sanchi World Heritage Area. *International journal of heritage studies*, 12(5), 458-473.
- Kent, E. F. (2013). *Sacred groves and local gods: religion and environmentalism in South India*. Oxford University Press on Demand.
- Khan, M. L., Khumbongmayum, A. D., & Tripathi, R. S. (2008). The sacred groves and their significance in conserving biodiversity: an overview. *International Journal of Ecology and Environmental Sciences*, 34(3), 277-291. Mace, G. M., Norris, K., & Fitter, A. H. (2012). Biodiversity and ecosystem services: a multilayered relationship. *Trends in ecology & evolution*, 27(1), 19-26.

- Laird, S. A. (2004). Trees, forests and sacred groves. *The overstory book: cultivating connections with trees*, 30-34.
- Malhotra, C., Yogesh G, Sudipto C, and Sanjeev S. 2001. "Cultural and Ecological Dimensions of Sacred Groves in India." *INSA, New Delhi*.
- Mekonen, S. (2017). Roles of traditional ecological knowledge for biodiversity conservation. *Journal of Natural Sciences Research*, 7(15), 21-27.
- Morand, S., Lajaunie, C., & Satrawaha, R. (2017). *Biodiversity Conservation in Southeast Asia*. Routledge.
- Phillips, A. (1998). The nature of cultural landscapes—a nature conservation perspective. *Landscape research*, 23(1), 21-38. (1): 149–80. <https://doi.org/10.3406/ethio.2004.1073>.
- Phuthego, T. C., and R. Chanda. 2004. "Traditional Ecological Knowledge and Society-Based Natural Resource Management: Lessons from a Botswana Wildlife Management Area." *Applied Geography* 24 (1): 57–76.
- Posey, D. (1990). Intellectual property rights: and just compensation for indigenous knowledge. *Anthropology Today*, 6(4), 13-16.
- Pretty, J., Adams, B., Berkes, F., De Athayde, S. F., Dudley, N., Hunn, E., ... & Pilgrim, S. (2009). The intersections of biological diversity and cultural diversity: towards integration. *Conservation and Society*, 7(2), 100-112.
- Singh, S., Youssouf, M., Malik, Z. A., & Bussmann, R. W. (2017). Sacred groves: myths, beliefs, and biodiversity conservation—a case study from Western Himalaya, India. *International journal of ecology*, 2017.
- UNEP. (1999). *The Cultural and Spiritual Values of Biodiversity*. Text and Annexes, UNEP Interim Secretariat for the Convention on Biological Diversity, Geneva, Switzerland.
- Verschuuren, B. (Ed.). (2010). *Sacred natural sites: Conserving nature and culture*. Routledge
- Warren, D. M. (1996). Indigenous Knowledge, Biodiversity Conservation and Development. *Sustainable Development in Third World Countries: Applied and Theoretical Perspectives*
- Wilkie, L. A. (1996). Medicinal teas and patent medicines: African-American women's consumer choices and ethnomedical traditions at a Louisiana plantation. *Southeastern Archaeology*, 119-131.
- Woldu, Z., Edward, S., Demissie, A., Bekele, T., & Haase, G. (1999). Forests in the vegetation types of Ethiopia and their status in the geographical context.