



## **Intangible Cultural Heritage**

Supporting research and documentation of indigenous knowledge systems on biodiversity conservation, climate change and disaster risk reduction in Eastern Africa

UNESCO 2003 Convention for the Safeguarding  
of the Intangible Cultural Heritage

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## Foreword



The case studies under this project demonstrate the importance of knowledge systems about biodiversity, ecosystems and the climate as integral parts of our intangible cultural heritage. Indeed, intangible cultural heritage, or living heritage, refers to the practices, representations, expressions, knowledge and skills, that communities pass on from generation to generation in response to their environment, their interaction with nature and their history. Living heritage therefore embodies human experience accumulated over centuries, while at the same time being dynamic and responsive to the context and needs of each generation.

As such, living heritage is manifest in knowledge systems, which may for instance contain detailed knowledge about local flora and fauna, traditional farming techniques, healing systems and seasonal rituals. Yet, such knowledge and practices are embodied within broader social, historical and cultural contexts, which underlie our identity and how we understand and relate to the world. The transmission of these knowledge and practices, be it through words, songs, dances, ceremonies and so on, also carry and engrain our values towards nature, often fostering notions of respect, custodianship, and connectivity towards the environment.

Understanding and valorizing these different values – through the safeguarding of intangible cultural heritage – will be critical in the coming years to facilitate the adoption of responsible behaviors towards the environment and inclusive and holistic approaches towards its management. The 2003 Convention for the Safeguarding of the Intangible Cultural Heritage recognizes and promotes community-based initiatives, such as those outlined in the present project, to leverage the contribution of intangible cultural heritage to the protection of biodiversity, reduction of disaster risk and mitigation of climate change impacts.

Dr. Tim Curtis

*Chief of the UNESCO Living Heritage Entity*

*Secretary of the UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage*

## Introduction



Indigenous and local knowledge refers to the understandings, practices, skills and philosophies developed by peoples and societies with long histories of interaction with natural resources and their whole environment. These dynamic and complex knowledge systems are held by community institutions, transmitted intergenerationally, and are constantly adjusting to changes of the environment and society.

For local communities and indigenous peoples, their knowledge, sustained by their values and social organization, informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses

language, systems of classification, resource use practices, social interactions, ritual and spirituality. These unique ways of knowing are important facets of the world's cultural diversity, and provide a foundation for locally-appropriate sustainable development.

UNESCO has been influential in ensuring that indigenous and local knowledge holders are included in contemporary science-policy-society fora on issues such as biodiversity assessment and management (UNCBD, IPBES), climate change assessment and adaptation (IPCC, UNFCCC), natural disaster preparedness (ISDR), national ecosystems assessments (BES Net) and sustainable development (Rio+20, Future Earth).

UNESCO's Local and Indigenous Knowledge Systems programme (LINKS) promotes indigenous and local knowledge and its inclusion in global climate science and policy processes. Working at local, national and global levels, LINKS strives to support indigenous peoples and local communities in mobilizing their knowledge and helps foster transdisciplinary engagements with scientists and policymakers. Our mission is to work with partners to pilot research and novel methodologies to bring a multiple evidence and rights-based approach to understanding and responding to climate change impacts, adaptation and mitigation.

The current and future generations of our planet are challenged by an array of phenomena that have arisen from the processes of industrialization, colonialism and the emergence of a global economy that places greater attention on commodities and commerce, than it does on the sustainability of our planet. UNESCO is mandated to explore how indigenous and local knowledge provide us with alternative visions and tools for promoting greater sustainability, intercultural and transdisciplinary cooperation and learning opportunities.

LINKS congratulates the 2003 UNESCO *Convention for Safeguarding the Intangible Cultural Heritage* and its partners for the elaboration of these seven case studies from Eastern Africa and the Horn of Africa, which respond to African and global trend to mobilise indigenous and traditional knowledge to respond to the challenges of sustainable development and resilience.

Dr. Nigel Crawhall

*Chief of UNESCO Section for Local and Indigenous Knowledge Systems (LINKS)*

## Introduction



The seven case studies featured in this publication were developed as part of the pilot project “Supporting Research and Documentation for Case Studies of Indigenous and Traditional Knowledge Systems for Biodiversity Conservation, Climate Change Adaptation/Mitigation, and Disaster Risk Reduction in Eastern Africa,” which was carried out in 2021 in the framework of the United Nations Educational, Scientific and Cultural Organization (UNESCO) 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, and managed by the UNESCO Regional Office for Eastern Africa.

The intangible cultural heritage initiative has drawn on the innovative community-led research of African pastoralists, led by the UNESCO Local and Indigenous Knowledge Systems (LINKS) programme, from 2014 onwards, [Knowing our Changing Climate in Africa](#)

During the 2021 initiative, national research teams were mobilized in Eritrea, Ethiopia, Kenya, Seychelles, Somalia, South Sudan, and Uganda to carry-out the research and develop case studies on traditional knowledge systems linked to biodiversity conservation, climate change adaptation/mitigation or disaster risk reduction according to a research brief, which was developed by UNESCO with guidance from an Advisory Panel.

This project also brought together key players focusing on indigenous and local knowledge systems for biodiversity conservation, climate change mitigation/adaptation and disaster risk reduction, including: UNESCO, United Nations Environment Programme (UNEP), United Nations Office for Disaster Risk Reduction (UNDRR), and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM). This project also helped UNESCO to strengthen synergies between the UNESCO Science and Culture Sectors by drawing on guidance, resources, and networks of both the LINKS and Intangible Cultural Heritage programmes.

In addition to sharing these case studies through this PDF publication, the results of this research will also be widely used by UNESCO Member States and partners:

- To consider in national inventories and safeguarding strategies;
- To contribute to UNEP’s African Group of Negotiators on biodiversity and the Post-2020 Global Biodiversity Framework;
- To provide examples for the ICCROM-UNDRR Guidebook on Intangible Cultural Heritage and Disaster Risk Reduction; and
- To inform the newly formed UNESCO Advisory Panel on Culture and Climate Change.

This pilot project was an important contribution to the practical and policy linkages between Intangible Cultural Heritage and the large body of work already underway by our partners and others in these critical fields of biodiversity conservation, climate change adaptation/mitigation and disaster risk reduction.

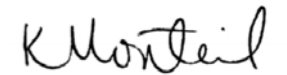
We now have an opportunity through the action of the Member States and civil society partners to help build the necessary capacity of our partners in identifying and safeguarding traditional knowledge systems that are part of intangible cultural heritage practices. UNESCO, in close cooperation with African governments and National Commissions, can create enabling frameworks for communities and

sub-national government bodies to apply these competencies, skills and frameworks to addressing the multiple impacts of climate change and loss of biodiversity and soil degradation. Culture, from UNESCO perspective, is not something to be placed to a shelf or brought out for special days, it is our frontline to ensure livelihoods and environmental governance. For the Africa region, it is critical to support the application of intangible cultural heritage and indigenous and local knowledge to our developmental and environmental pathways, including within UNESCO designated sites, such as World Heritage properties and Biosphere Reserves.

In addition to responding to the Paris Climate Agreement, which calls all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, these kinds of collaborations follow the spirit of the United Nations Reform underway, which calls on UNESCO to work more closely with our sister agencies and with partners on the ground to support Member States in reaching the Sustainable Development Goals by 2030. They also respond to the Aspiration 5 of the African Union Vision 2063, which calls for “An Africa with a Strong Cultural Identity, Common Heritage, Values and Ethics” as well as the celebration of the African Union Year for Arts Culture and Heritage in 2021.

Lastly, we hope you will enjoy reading these case studies and learning more about how traditional knowledge systems that are part of East African communities’ intangible cultural heritage practices can contribute to biodiversity conservation, climate change adaptation or mitigation as well as disaster risk reduction.

We would like to sincerely thank the members of the Advisory Panel who guided these studies through the research brief, all of the national teams who carried out the research and documentation, and most of all each and every member of the local community who shared their knowledge with us for these studies.



Ms. Karalyn Monteil  
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# Eritrea

## Research and Documentation of Traditional Knowledge Systems on Biodiversity Conservation and Climate Change: Experience from Lamza Village, Eritrea

Commission of Culture and Sports

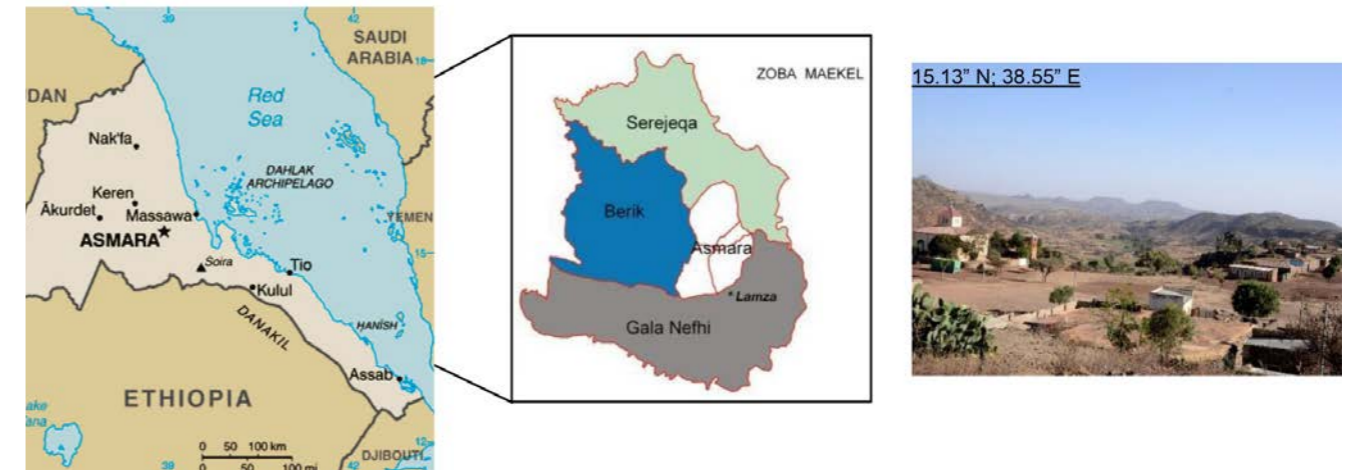
Dr. Tsegai Medin



Photo credit: Eritrean Commission of Culture and Sports

## Geographical location

Lamza village is located in the administrative region (*zoba*) of Maekel and sub region of Gala-Nefhi, about 12 km from the southern suburb of Asmara. The Gala-Nefhi sub-region has 32 individual villages with about 8328 households (Kiflemariam, 2001). Lamza has a total of 83 households and 411 people, which makes it one of the smallest villages in the region (Kiflemariam, 2001).



Village location, Maekel region, and Gala-Nefhi sub region. Part of the village's common courtyard.

Photo credit: Eritrean Commission of Culture and Sports

The village is located, at a GPS reading of 15.13' N; 38.55' E (Kiflemariam, 2001) and the settlement is built on top of the plateau and formed by cluster of mainly traditional houses (*Hidmo*) surrounding the village's common courtyard. The two sides of the plateau are broken by large gorges forming a natural boundary with the villages of Adi-Hakefa, Adi-Qe, Adi-Tsenaf, Adomzemat and Merhano.

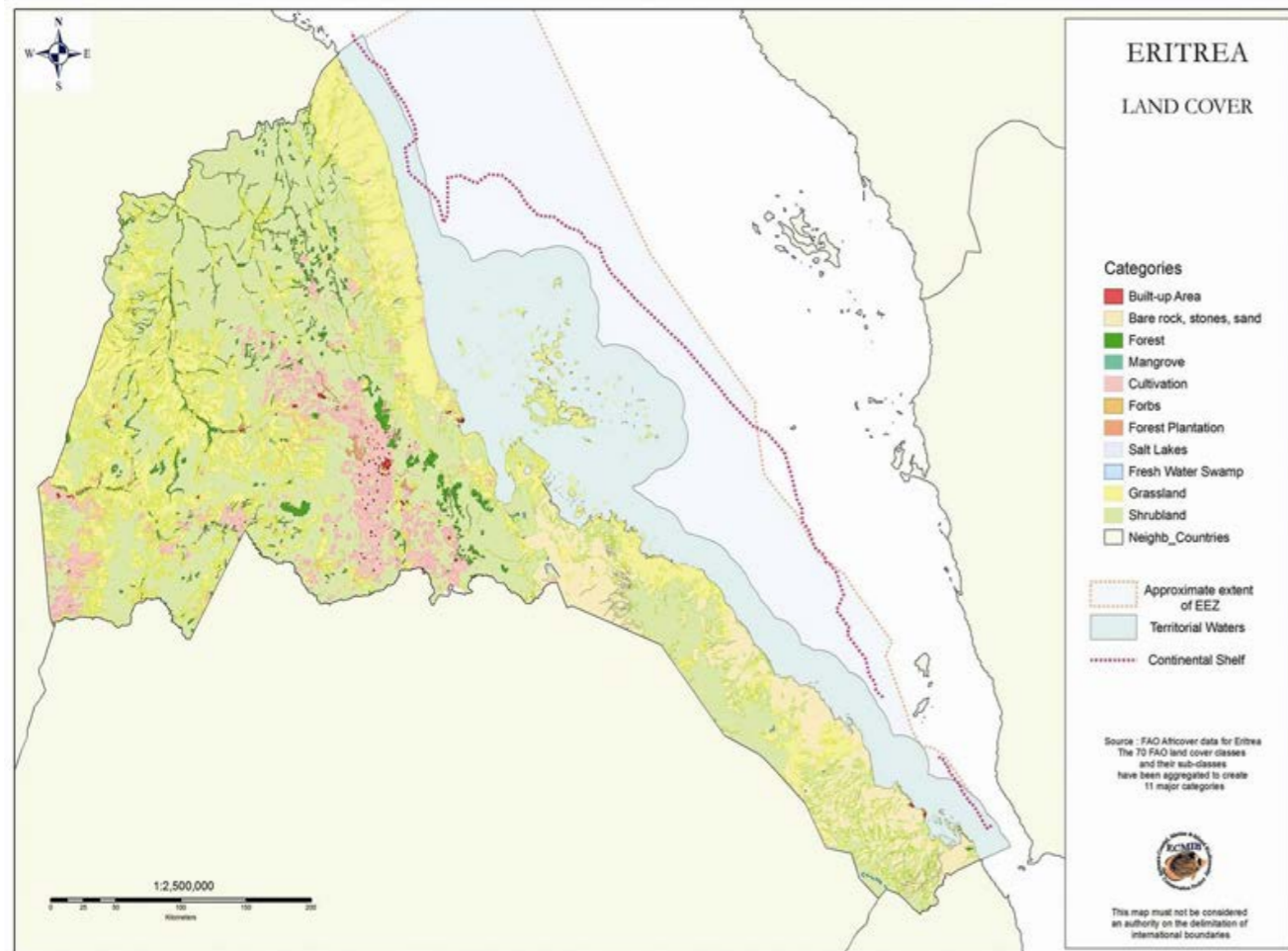
## Background to the case study

Forests are among the main resources commonly accepted as being scarce throughout the world. Due to increased and unstable climatic fluctuation and excessive agricultural use, forest coverage is dramatically shrinking across the world. For example, the world has lost one-third of its forest<sup>1</sup> and expansion of agriculture is seriously threatening the biodiversity<sup>2</sup> of our planet.

It is difficult to create a balance between scarce resources and the theoretically limitless needs of humans; and this is often considered as a basic economic problem. Over time, societies have been experiencing this natural imbalance. Consequently, people are being required to make decisions about how to allocate resources efficiently, in order to satisfy not only basic needs but also as man additional perceived needs as possible. Communities tackle this difficulty by forming local institutions which are responsible for regulating and ensuring sustainable use of communal resources. Such institutions are based on traditional knowledge of the environment which evolve and accumulate through time. The regulations are deeply embedded within a society's living heritage, and show strong connections to their natural environments. If such resources are utilized without regulation, they will be exploited on a 'first-come-first-served' basis (Gebremedhin et al., 2003).

<sup>1</sup> <https://ourworldindata.org/world-lost-one-third-forests>

<sup>2</sup> Biological diversity is defined in terms of the wide variety of plants, animals and micro-organisms.



Eritrea land cover map showing the country's natural vegetation cover such as, forests, mixed woodland, mixed grassland, bushes, riverine forests and mangroves.

Photo credit: Food and Agriculture Organization (FAO), UNESCO

This may result in overexploitation and eventual deterioration of resources.

Eritrea possesses an immense wealth of living heritage which is found deeply-rooted within its nine ethno-linguistic groups. Nonetheless, such potentially significant heritage is still utterly unexplored and under-documented. In 2010, the country ratified the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage and, ever since, it has been working closely with UNESCO to safeguard the country's diverse living heritage.

Considering the huge potential of living heritage – 'the traditional knowledge related to biodiversity conservation and climate change' – it is comparatively well exercised within the nine ethno-linguistic groups. Recent knowledge has been acquired from experience linked to the climatic fluctuations happening due to the continuing expansion of the Sahara Desert which has resulted in the country suffering grave natural and environmental land degradation, such as, erosion, forest degradation, biodiversity destruction (World Bank, 1994; Gebremedhin, 1996; FAO, 1997; Gebremedhin, 2002). Statistical data from the Ministry of Agriculture show that forest coverage was estimated about 30 % 100 years ago. However, now, due to a variety of factors the coverage drastically reduced to 1%.

Such severe land and forest degradation and the resulting degradation of natural resources has caused serious ecological and social effects as well. As a result, in 1994, the Government of the State of Eritrea

launched summer work programs to restore the natural environment. As a result, between the years of 1994 and 2016, 19 million holes were dug, 23 million seedlings planted and 17,000 kilometers of terraces made. At the same time, certain villages (in the highlands and lowlands of the country) were initiating programs for protecting their forests and launching afforestation activities by planting new trees, making terraces, and identifying enclosures. Importantly, they depend on their communal traditional regulations in managing their environment.

Lamza village is considered exemplary for its commendable role in the conservation of biodiversity and climate change. The inhabitants of this small village own a potentially rich living heritage related to resource governance linked to their natural environment. A study from this village referred to the traditional resource management systems of the village as 'Governance without Government' (Kiflemariam, 2001), indicating the still live and self-regulating living heritage inherited from their ancestors. The study demonstrates the fact that forest management, must be designed at community rather than national level (Demel et al., 2005) and should depend upon active participation of rural people to integrate their creativity into decision making (Banana et al., 1999).

This pilot study, with the aim of studying communities' traditional knowledge and their role in biodiversity conservation and climate change, was initiated during lock-down due to the global pandemic, COVID-19. And so, because of the lockdown, the study focused on the experiences of one community, Lamza, a small but exemplary village from around the Capital of Asmara, and will discuss their long-preserved living 'governance' heritage in relation to biodiversity, soil and water conservation, and climate change.

## Statement of the problem

Eritrea is one of the sub-Saharan countries which is gravely affected by the rapid environmental and/or climatic shifts. As a result, huge resources are allocated each year for restoring the environment by controlling the expansion of desertification. Congruent to this, and in order to achieve the desired outcome, the involvement of community is considered fundamental. Communities are strongly attached to their environments and own unexploited heritage in preserving biodiversity conservation and off-course climate change. Societies have, traditionally, long been involved in maintaining their micro-environmental space through traditional knowledge and practice. Hence, this knowledge has to be studied, documented and further promoted, in order to encourage its use and to learn from the practice.

## Objectives of the case study

The objectives of the project include the following.

- To study and understand the traditional ICH knowledge and/or practice pertaining to governance of biodiversity conservation and climate change in the Lamza community.
- To preserve and promote the systemic aspects of the practice as the best ICH technique in combating climatic change.
- To enlighten and encourage researchers to further study the practice imbedded within the Eritrean ethno-linguistic groups incorporating wider space and environment.
- To demonstrate the importance of the Lamza village governance as a best tool for common pool

resource sharing, which totally refutes the well-known theory of the 'Tragedy of Commons' developed by Hardin (1968).

- Encourage other communities to share and exercise the governance of traditional knowledge and/or practice pertaining to biodiversity conservation and climate change.

## Case study focus

The project case study is at Lamza village, which is located about 12 km south of the Capital City of Asmara. The selection of Lamza as the case study is based on: (i) the village is identified as exemplary, by the Ministry of Agriculture, for its best conservation practice and traditional knowledge in biodiversity, soil and water conservation and climate change; (ii) due to the second pandemic lock-down across the country travel was limited and this particular village was easily accessible by bike or on foot; (iii) most importantly the traditional knowledge pertaining to biodiversity conservation and climate change is still lively practiced within Lamza village.

## Research design and methods/procedures

The design and methodology adopted for this project emanate from the motives of the study, which is the documenting and promoting the systems of governance imbedded within the Lamza community's living heritage pertaining to biodiversity, soil and water conservation and climate change.

A series of field work visits were organized to the village, where biodiversity, soil and water conservation and climate change are best practiced. The aim of the field work was to study and document the long-practiced traditional knowledge. Despite the challenge of a COVID-lockdown the team was able to visit the site a couple of times and able to conduct their research, thanks to the generous support of the Lamza community. The team further documented activities related to the practice in order to develop a short video documentary.

The case study was developed based on three main data gathering and analysis methodologies. These include: (i) informal discussions, (ii) literature review, (iii) field visits, (iv) interviews. Moreover, a variety of information-generation methods in written, video and audio forms were applied. Generally, the main approaches employed as means of data-gathering methods, included: observation, note-taking, interviewing, participatory video, photography and audio recording.

### Establishment of the National Research Team (NRT)

The National Research Team is composed of three researchers working in the field of culture, two in the field of agriculture (agriculture planning and soil and water conservation) and one audio visual expert. The two experts from the Ministry of Agriculture were selected based on their research experience and affiliation to the study area. As a result, they collaborated in identifying and selecting the study area.

### Informal discussions

Prior to the initiation of the research project, the strategy and aim of the study was informally discussed with various bodies within the country. Members of the team, discussed with potential collaborators at the Commission of Culture and Sports, the Ministry of Agriculture and the UNDP office in Asmara.

## Literature review

The team identified and collected different secondary data references. These include a master's thesis research conducted at the proposed case-study area, Ministry of Agriculture reports, UN and FAO country reports, and other references referring to climatic information in this specific area, in Africa and in the rest of the world. Furthermore, references related to concepts and practices of Intangible Cultural Heritage were collected.

## Field visits

The National Research Team organized several visits to Lamza village. The first reconnaissance visit helped to familiarize the researchers with the study area and the community. Further, it helped to create the opportunity for the research team to introduce themselves and to identify key informants. Therefore, close observation of the area and the community was carried out by the team. The NRT also met the community representatives, and as a result they were granted permission to make a second visit. During the second visit the NRT prepared a consent document for informants and authorities to sign, to officially gain permission to initiate the study and use the data for research purpose. In addition, the NRT further discussed with the village elders and administrators the general nature and aim of the research. Consent was given to consult the community and this also verified their voluntary participation in the research. Based on the communications made during the first visit, the NRT documented audio, video and written consents of the Sub- region and village administrators, and the knowledgeable elder of the village.

## Interviews

Following introductory explanations and comprehensive community-based meetings about the aim and purpose of the project, the interviews started. Interviews were based on pre-arranged questions and checklists prepared by the National Research Team. The team continued with open-ended interviews on successive visits.

## Ethics considerations and human rights issues

This pilot project has been conducted following UNESCO's research ethics and methodological modalities. The National Research Team were encouraged to incorporate the community's voluntary participation and permission to carry out the research and they did so by approaching the community and the administrators of the village with the aim of discussing the objectives and importance of the study and to gain their permission to conduct the study prior to any practical action.

After the first community meeting, the head administrator invited the team to his house for a surprise lunch and coffee ceremony, an indication of welcoming the team to initiate the research in their territory. In his introduction, the administrator explained that, they were always ready to collaborate with researchers who had good intentions and programmes for protecting their natural environment.

On their second visit, the team organized a consent-signing programme in written, audio and video forms. As a result, the village administrator, the knowledgeable father from Lamza village, and the Sub-zone administrator all signed the consents, signifying permission for the research to go ahead.

The interviews themselves were conducted taking age and gender into consideration.

The National Research Team will deliver feedback to the village community and the Commission of Culture and Sports of Eritrea, following national guidelines relating to COVID-19.

## Strengths and limitations of the case study

The project is significant in terms of studying and preserving the ICH knowledge of an highland Eritrean community (Lamza community), which is best practiced through methods of traditional governance and common pool utility resource sharing. This knowledge has been practiced by the Eritrean communities since generations and it is still a widely used practice across the country. Therefore, the main strength of the study can be summarized as follows:

- i. **Exemplary:** in its conservation and traditional governance practice in biodiversity, soil and water conservation.
- ii. **Accessibility:** even though the country was in Covid-lockdown, the researchers could reach the area designated for the case study by bike or on foot.
- iii. **Continuity of the practice:** the traditional knowledge is still widely practiced within the community of Lamza village.

In addition, the limitations of the study can be summarized as follows.

- iv. **Time and budget constraints:** the study could have been more comprehensive, however time was an issue. For comparative purposes, incorporating other case studies from other villages/districts would have been substantially significant. However, due to various constraints the current study was confined to one specific place.
- v. **Study season:** the season set for the data collection presented a hurdle as it coincided with the orthodox and Islam fasting time, which affected our research visits and informants.

## Findings

The informants said that, in Lamza, the 'enclosure' system started about 120 years ago. Though it is difficult to find out the exact reason for establishing the system, it is widely believed that a person named Kentiba Zere initiated the practice of restricting the area fearing that the Italian soldiers would abuse the trees. Following this, successive administrations restricted free access to the area concerned. They devised various rules and bylaws which still govern the use of a specific area. The rules are not unique to the village, because they are also practiced in other highland areas. Since its first establishment the location of the enclosure has not changed, but minor modifications have been made to other grazing lands to accommodate the needs of Lamza residents. Now the village has several specialized grazing areas for small ruminants, for suckling sheep/goats and a free grazing area for any kind of livestock. Relative to the other grazing lands, the 'enclosure' area is highly managed and is reserved mainly for oxen.

The enclosure is located in the north of the village, covering about 130 ha. The dry weather road which leads to the village bisects the enclosure. Each side is opened (one after the other) for grazing for about two months a year. From the greener scenery of the area, it is unmistakable that the enclosure system makes a positive contribution to regenerating vegetation. The enclosure is also rich in plant species.

The informants estimate that there are about 35 types of tree and shrub species within the enclosure (Table 1).

Rank	Species name	Main use by villagers
1	<i>Olea africana</i>	Firewood, poles, timber, different farm tools, toothbrushes, traditional medicine
2	<i>Acacia etbaica</i>	Firewood, charcoal, timber for construction, hand tools
3	<i>Dodonaea angustifolia</i>	Roofing material, firewood, traditional smoke bath, tool handles, toothbrushes
4	<i>Maytenus senegalensis</i>	Fencing materials, firewood
5	<i>Opuntia ficus-indica</i>	Edible fruit

Table 1: Five most important tree and shrub species found in Lamza's forest, and their uses Tsehaye (2012)

## Ethnography of Lamza village

The word Lamza is derived from *lam'ezī'a*, which literally means 'this cow' in Tigrigna language (one of the nine ethno-linguistic groups in Eritrea). It was coined from a story that tells of *Weizero* (Mrs) Wehazit - a widow whose husband was killed in a fight against bandits and who left her with a child and a milking cow. One day, Mrs Wehazit was asked to pay tribute to the ruler. She went to the ruler and explained that she had nothing except the milking cow to raise her child. The ruler understood her problem, however, he fell in love with the widow and ordered her to spend a night with him. Then *Weizero* Wehazit became pregnant and another child was born. The ruler told her to name the child *Lam ezi'a*. The child was raised with his elder brother all thanks to 'this cow' and so established the village in his name. Lamza is the land, while a *Lamzetay* is an individual that belongs to the village through the Lamza line.

## Unity

As the informants narrate, the Lamza community claim their lineage to one and the same ancestor, none of them claim their lineage to a different ancestor. This could be one of the reasons why the Lamza community are able to live together in a harmonious way.

Moreover, they have the culture of listening to and endorsing each other's concerns and opinions which, they believe, they have inherited from their forefathers. According to some of the informants:

*Our forefathers were wise and they understand how to survive in the natural world, as well as with communities around them, without a problem. The governance that you see today in Lamza was developed by our grandfathers; and we are safeguarding till these days. As it was counted one by one and documented by the members of the Ministry of Agriculture, there are twenty-two types of natural vegetation in this village today. There are also newly introduced kinds, such as cactus and eucalyptus.*

*If we go back in history, our forests began to be depleted with the advent of the Italian colonization in Eritrea. This is because the Italians were using coal for cooking food and didn't have electric energy at that time. The coalification holes built during the Italian stay in Eritrea are still visible in various villages.*



One of our great grandfathers named Kentiba Zerea is remembered for his efforts and commitment to preserve the natural vegetation and the governing mechanism that we see today. He chased anyone who tried to use the forest improperly.

In the 1980s, the Ethiopian army (during the Derg regime) settled in a nearby village called Adi-Guadad and they were fetching wood from all the surrounding villages for cooking their food. The stay of these army troupes for a long period of time exhausted the forest of the surrounding villages. However, in our case we had nine armed men in our village including myself. These nine armed men guarded the village from different directions. They confronted the army several times. However, one day they fired bullets from different directions at a group of armed soldiers who were ceaselessly cutting the trees of the village. The soldiers started to run away leaving the cut woods. Then I went to the commander of the army and told him about the incident and the commander warned the soldiers. After that incident the soldiers stopped cutting trees in Lamza.

(Testimony of our key informant Aboy Weldeab. Father Weldeab is 89 years old but still strong and confident. He was elected as the village administrator 13 times and administered the village for 39 years).

Another informant said:

All the natural vegetation, water and soil preservation in this village was possible, thanks to the tough but fair governance of Father Weldeab (father Sheba) who served us for 39 years.

There are well designed schedules regarding when to terrace the land and when to plant, and so on. Every individual family in the village participates in the communal effort to conserve soil and water, and other community activities.

Another informant added:

The secret of this village is unity, working together for the common benefits. We know that there is scarcity of resources in our village as well as around it. This is a huge challenge and we believe that we can face it if and only if we put our hands together and stand as one entity.

## Laws and bylaws

Our forefathers drafted laws and bylaws that allow villagers to use their natural resources in a wise and sustainable way. That is one of the reasons why the village of Lamza, which is only 12 kilometres away from the capital, is still covered with well-protected natural vegetation, while the surrounding villages are totally naked. 'The knowledge, wisdom, and commitment of our fathers and mothers was handed down through the generations and we still follow it', an informant told us.

Though there is no separate institution for managing the enclosure or woodlands, the village assembly is responsible for devising laws, assuring equitable allocation of resources from the enclosure and settling any cases in relation to use of resources.

There is a committee of three people locally known as *shimagle* for administering different tasks. For example, the water administering committee (*shimgle mai*), supervises water circulation among peasants and penalizes someone who breaks the rule of circulation. Moreover, there are *shimagles* for communal works, *shimagles* for *Hizaéti* (the enclosing of a grazing area), *shimagle* for wood use, and so on.

The village assembly is the entity with the highest power and can amend rules as it sees fit. Many of the respondents believe that the village assembly is competent in resolving issues that may

arise in appropriation of resources. The village assembly listens to appeals and settles conflicts. An expert from the Ministry of Agriculture (MOA) of the Sub-zoba said: 'it is not common to find an appeal from a resident of Lamza in our office, especially regarding conflicts of resource use'. And the respondents themselves revealed that they seek support from MOA to resolve conflicts that arise from neighbouring villages.

There are several punishments and sanctions in regulating the enclosure which have evolved over time. In the past, the fine for any illegal action was about nine *melelik* (about five kilos) of cereals (mainly sorghum, teff and barley) per shepherd. Whereas now, the fine is in livestock and there are specific punishments for contravening specific rules.

The informants further enlightened us:

*In our village we have recruited a village guard (Guassa-Adi), who watches, and reports in case there is any unusual and improper moves around and within the borders of the enclosure.*

The salary of the village guard is about 2,500 NKF. However, on top of this, every villager is vigilant and has the responsibility to stop and report any misappropriation.

*For example, if someone from another village is found cutting a tree without permission, then he or she will be punished 150NKF. But if she or he is from the village the punishment fee drops to 100NKF. If someone deliberately allows her/his animals to graze in the enclosure the punishment is 50NKF per cattle, while it is 25 and 20 NKF for individual goats and sheep respectively. However, if the grazing is not deliberate, which they call *wererta*, the penalty charge is 25NKF per cattle.*

According to the law of the village, families are not allowed to possess more than one milking cow and two oxen for ploughing.

Activities aimed at individual business/profit are not allowed. For instance, the villager or even an outsider, can eat the fruits of the newly introduced cactus tree in the village but they are not allowed to sell it.

The informants said that the interventions of government in the management of their enclosure are very minimal and limited to certain positive activities like the provision of seedlings and technical assistance. There is a strong feeling amongst all respondents that they are self-sufficient in the management of biodiversity protection, and the conservation of soil and water as a well. The administrator said:

*What we need from government bodies is to come and see what we are doing and appreciate it.*

## Discussion and conclusions

At Lamza village, the area of the vegetation enclosure is not open access. It has a clear boundary. Residents of Lamza and of the neighbouring villages alike are clear about the territory of the enclosure area. Eligible users are also easily identifiable. Any benefits from the area belong solely to residents of Lamza. What is being managed and by whom is also very clear. Therefore we can conclude that the boundaries of the resource and its users are clearly defined.

Operational rules which govern appropriation of resources are relevant and fit into the local situation of their village. Ability of the enclosure to meet the needs of the villagers is the crucial success factor for its effective protection. If the benefits from the enclosure area were not

commensurate with the effort required to protect and manage it, the people would not be diligent in protecting it. Residents agree that the rules are fair and legitimate. That is why all the respondents want the future management of the enclosure to remain with them.

They are not using resources to their exhaustion. Use rate by eligible users matches the ability of the system to provide the required resource. Operational rules consider the lifestyle of the users, e.g. seasons of farming and when there is a higher high demand for fuel wood (for example, social events like weddings, mourning, religious festivals). The fact that only a limited number of oxen are allowed, as are fewer destructive activities (e.g. carving farm tools, bee keeping, grazing of sick oxen etc.), shows that the operational rules take into account the ability of the resource to regenerate. Thus, operational rules are not only preventing outsiders from accessing the area but also perfectly regulating the use-rate of eligible members.

Residents have also contributed huge labour in making soil conservation structures inside the enclosure and interviews suggest that residents are willing to continue to provide this support. The administrator and the village assembly are also capable of dealing with the few people who refrain from participating in collective action. We can conclude that there is a clear congruence between appropriation and provision of rules.

Monitoring is undertaken by the users themselves, no external body is involved. The guard is appointed and paid by the villagers and is accountable to all users. The salary of the guard is equivalent to a government employee with a bachelor degree. In the rural area, this is a very attractive salary. Every resident is also an unofficial guard, i.e. mutual monitoring is very strong. We can say that monitoring is a by-product of the advantage they get from the enclosure area. The quasi-voluntary compliance situation, 'I will if you will', is very visible. That is why there are few lawbreakers from inside. In Lamza's enclosure free-riders are more likely to be caught and punished.

There are specific punishments for specific violations. Occasional and unintentional offences face milder punishments than deliberate ones. Sanctions escalate with the likelihood of the offence to cause damage and also the previous record of the offender. However they may need government's help in suing and punishing repeat offenders from outside (e.g. neighbouring villages) who cannot be judged within the village assembly system.

This study concludes that the community in the case-study village in question has deep traditions and detailed bylaws (operational rules) in managing their woodland enclosure, which have evolved over a long period of time. The community plays a major role in protecting, monitoring and enhancing the regenerative capacity of their enclosure. The research findings show that the enclosure system has been protected thanks to traditional knowledge of the community, who are actors in developing an efficient governance system. Other communities can learn from this system how to protect their own natural environments. Furthermore, the government needs to encourage them to safeguard their knowledge, in order to transmit it to the future generation.

## Recommendations

- Action – in preserving both the enclosure system and the intangible cultural heritage knowledge inherited from previous generations.
- The practical outcomes of the knowledge of traditional governance of the Lamza community, need to be protected, at government level, and also shared with other communities.

## Acknowledgements

- Lamza village and its people
- The Commission of Culture and Sports of Eritrea
- All informants from the village
- UNESCO Regional Office for Eastern Africa
- Central office, Ministry of Agriculture, Asmara
- Gala-Nefhi Sub-regional Branch, Ministry of Agriculture
- Gala-Nefhi Sub-region Administration
- The UNDP office, Asmara

## List of potential informants met and/or interviewed

Full Name	Main Role	Gender
Woldeab Woldeyohannes	Key Informant	Male
Issac Asgedom	Informant	Male
Habtemariam Amenay	Informant, Sub-region Agriculture Head	Male
Berhane Gedeon	Informant	Male
Teklehaimanot Kahsay	Informant	Male
Habtemariam Ghebremeskel	Informant	Male
Rozina Tesfay	Informant - Village administrator	Female
Michael Abraha	Informant	Male
Asmerom Isaias	Driver	Male
Ghebremariam Teklay	Driver	Male
Tesfay Amaha	Driver	Male

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Part of the Lamza Village vegetation enclosure (Photo credit: Eritrean Commission of Culture and Sports)



The Lamza village dam (Photo credit: Eritrean Commission of Culture and Sports)



Vegetal plantation in Lamza village (Photo credit: Eritrean Commission of Culture and Sports)



Part of the village's common courtyard (Photo credit: Eritrean Commission of Culture and Sports)



A villager working at his plantation down from the dam (Photo credit: Eritrean Commission of Culture and Sports)



Key informant, 89 years old Father Woldeab still strong and confident (Photo credit: Eritrean Commission of Culture and Sports)



Members of National Research team paused to show vegetal products from the village (Photo credit: Eritrean Commission of Culture and Sports)



The National Research team and the informants (Photo credit: Eritrean Commission of Culture and Sports)

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# Ethiopia

## Indigenous Knowledge System and Biodiversity Conservation: The case of Gedeo Zone, South Ethiopia

Addis Ababa University  
Dr. Getachew Senishaw



Photo credit: Getachew Senishaw

## Geographical location

The Gedeo Zone is located in the Southern Nations, Nationalities, and Peoples' Region (SNNPR) of Ethiopia. The Zone is positioned at 5° .84"– 6° .43" North Latitude and 38° .08"–38° .44" East Longitude. It is surrounded by Borena Zone of the Oromia Region in the south, east, and west, and shares its northern boundary with the Sidama Region. The total area of the Zone is 1,210.89 square kilometres, which is divided into six *woredas* (districts) and two city council administrations. According to a report by the Central Statistics Agency (CSA), the population of the Zone in the 2015 projection was 1,054,764, the majority of whom (87.3%) were living in rural areas, while 12.7% were living in urban areas. At the time, Gedeo's population density was 817.7 persons/km<sup>2</sup> (CSA, 2010; CSA, 2012; CSA, 2014) which made it one of the most densely populated areas in the country (SLUF, 2006).

## Background of the case study

Human-environment relations have a long history, dating back to the period of hunter-gatherers. Human interventions with the natural environment are highly related to population growth (Moran, 2006; Scupin, 2000). Population growth often leads to deforestation due to an increase in the need for agricultural land, additional energy, and construction materials (Beniston, 2000). According to Miller (2006), growing populations directly affect about 83% of the earth's land surface, excluding Antarctica. The reciprocal effects of humans and environment vary from time to time and from society to society depending on the knowledge, production systems, and cultures of the societies. Change in one of these elements could alter human-environment relations and biodiversity (Moran, 2006). Therefore, considering population as an independent factor without the contextualization of indigenous knowledge and practices does not give the full picture of human ecology.

Indigenous knowledge and biodiversity are complementary to each other, and they are essential for humans. Indigenous people highly depend on natural resources for food, clothing, shelter, and companionship. These people realize that biodiversity is crucial for their livelihoods. As such, they have developed a mechanism to preserve and restore biodiversity. They place indigenous knowledge, practices, and beliefs in an integrated manner. The knowledge is not only about flora and fauna but also about soil, water, and climate as well as the interrelation between these components. Such a holistic approach of ethno-ecological knowledge is important for biodiversity conservation. That is why most of the high-biodiversity places in the world have been inhabited by indigenous people. For instance, the tropical rainforests are the world's richest places of biodiversity containing more than fifty per cent of the world's species and accommodating 2,900 world ethno-linguistic groups, which make up forty-two per cent of the total ethno-linguistic groups in the world (Gadgil et al., 1993; Pierotti and Willcar, 2000; Zant, 1999).

In spite of its importance, indigenous knowledge was neglected during the colonial period which had a tremendous effect on the decline of biodiversity. However, with the decline of biodiversity, the importance of indigenous knowledge is nowadays recognized as a means for biodiversity conservation (Warren, 1992; Zant, 1999). The Convention on Biodiversity has also given emphasis to the importance and preservation of indigenous biodiversity conservation (UN, 1992).

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## Statement of the problem

Indigenous ecological knowledge has a holistic and integrated approach which includes diverse issues for sustainable ecology (Berkes et al., 2000; Lolande, 2010). Social institutions, particularly religious and traditional administration systems, have important roles in the encoding, transmission, preservation, and survival of indigenous knowledge; and hence maintaining sustainable ecology (Berkes et al., 2000). However, the roles of indigenous ecological knowledge for biodiversity preservation and ecological sustainability are marginalized in human-environment relations (Nygren, 1999). History tells us that in the 19<sup>th</sup> century, colonialists and social scientists ignored and sometimes maligned indigenous knowledge (Warren, 1992). Hobart (1993) argues that indigenous knowledge was ignored in the post-war period in favour of 'western scientific knowledge' and dismissed as a mere impediment to development. This gave the opportunity for western views to prevail in the developing world, such as Africa.

Similarly, indigenous knowledge has been given less attention in Ethiopia. Even the 1997 Environmental Policy does not recognize or mention the importance of indigenous knowledge for environmental protection (EPA, 1997). The ramifications of such insignificant attention given to indigenous knowledge have been manifested in the depletion and loss of the knowledge, traditional wisdom, and survival strategies (Bekalu, 1994; Turner et al., 2000). Such a trend further marginalized indigenous knowledge and precluded it from being part of the solution for environmental problems (Nygren, 1999).

Ethiopia is a country where human-environment relations and productions have a long history (Gemechu, 1988). The same is true for Gedeo Zone which has unique relations with the environment and has lessened the consequences of deforestation and land degradation that might have, as in many cases, resulted from population pressure. The Zone is one of the areas where indigenous knowledge and practices are vital for livelihoods, biodiversity conservation, as well as positive human-environment relations. Accordingly, the smooth interrelation between indigenous knowledge, livelihood strategies, and biodiversity conservation in the framework of human-environment relations are exemplary in the Zone.

Taddesse (2002) studied the land use of the Gedeo society, particularly in *enset* (*E. Vantricosum*) production, in the context of employing scientific agricultural methods. Dagne (2004) also reported on production practices of *enset* and coffee without putting much emphasis on biodiversity conservation. These and other similar studies conducted in the area have not dealt with the role of indigenous knowledge in biodiversity conservation. As such, there is a dearth of empirical evidence on the significance of indigenous knowledge for biodiversity conservation. Thus, this case study focuses on this gap and explores the role of indigenous knowledge in biodiversity conservation in Gedeo Zone.

## Objectives of the case study

The main objective of the case study is to explore and document the relation between indigenous knowledge and biodiversity conservation in the Gedeo Zone. More specifically, the study seeks to:

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- i. Describe the indigenous knowledge system of the Gedeo
  - ii. Document the Gedeo biodiversity conservation mechanisms
  - iii. Examine challenges of indigenous knowledge systems and biodiversity conservation
  - iv. Suggest safeguarding measures of indigenous knowledge and biodiversity conservation.

## Case study focus

This case study focuses on Gedeo Zone of southern Ethiopia to understand the relation between indigenous knowledge and biodiversity conservation. Within this focus area the study was conducted in selected areas of the zone, aiming to understand the Gedeo indigenous knowledge system and indigenous biodiversity management, to identify challenges of the indigenous knowledge system and biodiversity conservation that affect the sustainability of the local ecology, and, finally, to propose safeguarding measures of indigenous knowledge and biodiversity.

## Research design, methods and procedure

### Literature review

The 2003 UNESCO Convention for Safeguarding of Intangible Cultural Heritage categorized indigenous knowledge about nature and the universe as the fourth domain of intangible cultural heritage (UNESCO, 2003). Article 2 of the 1992 Convention on Biological Diversity defines biodiversity as: '... the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems'. This definition, which tries to incorporate most components and specify most features of biodiversity, is a preferred definition for the purpose of this case study.

Indigenous people with a historical continuity possess broader knowledge of complex ecosystems. The knowledge is transferred from generation to generation through a long series of observations. Regarding this, Gadgil et al. (1993) argue that 'diachronic' observations have a significant value in complementing the 'synchronic' observations on which western science is based.

Considering indigenous knowledge as complementary and equivalent to scientific knowledge enhances our knowledge about different issues (Sefi, 2017). There is evidence in Ethiopia that indigenous knowledge is complementary to scientific knowledge to the point where scientists have developed conservation strategies using farmers' knowledge. Consequently, farmers and scientists can work together as partners to benefit from each other's knowledge (Kelbessa, 2015).

Warren (1992) stated that cultural diversity is closely linked with biodiversity. Culture plays a significant role in protecting the environment and ecosystem. Conservation of environmental resources and ecosystems have been integral parts of human culture (Maru et al., 2020). There are some indigenous groups that have manipulated the local landscape and restored biodiversity in degraded landscapes using their indigenous knowledge (Gadgil et al., 1993). Concerning biodiversity preservation, Dutfield (1999) also argues that indigenous knowledge adds value to biodiversity conservation. However, it is important to note that not all pre-scientific societies have necessarily lived in harmony with the natural world (Gadgil et al., 1993).

Maintenance of biodiversity includes the worldview and religious philosophy of the people which dictate the environmental ethics and practices involved in the use of natural resources (Sefi, 2017). Indigenous people use laws in accordance with custom and habitual practice for conservation and protection of their environment (Maru et al., 2020).

Local people in different parts of the world cherish biodiversity for the sake of satisfying their needs (Kelbessa, 2015). For instance, sacred forests are protected primarily for spiritual reasons (Maru et al., 2020). Some animals are also considered sacred and thus are not hunted (Hens, 2006). In southwest China gods are believed to reside in the Holy Hills in which no gathering, hunting, forestry, and cultivation take place (Kelbessa, 2015). Hence, the ideas surrounding sacred forests and taboo practices contribute to biodiversity conservation activities. Gadgil et al. (1993) illustrated ways of biodiversity management using indigenous knowledge in the Amazon basin and diversity management of species in aquaculture systems in China, Hawaii, and Indonesia (including rice and fish cultivation). These authors also described biodiversity conservation activities in Brazil and the Ecuadorian side of the Amazon forest. Indonesia's traditional system which combines rice with fish cultivation, the rotation of hunting areas among the hunter-gatherers, and the rotation of pasture land among the pastoralists are some examples of enhancing conservation of biodiversity.

In Africa, small-scale farmers in Sierra Leone are exemplary in conserving biodiversity (Warren, 1992). In Rwanda farmers recognized a dozen different potato varieties based on their characteristics (Warren, 1992). Traditional farming in Ghana used wild varieties of spices (Hens, 2006). In addition, some wild animals are considered sacred and hunting them is prohibited. Some communities refrain from killing pregnant animals (Kelbessa, 2015). Similarly, Eyong (2007) conducted a case study on indigenous conservation practices in the Korup forest in Cameroon where hunting of young and pregnant animals is prohibited. The people in the Korup forest also have a tradition of growing fruit trees on their farms. They have detailed knowledge about plants and animals and use various methods to conserve biodiversity. On the other hand, access to the Korup forest by outsiders is strictly controlled by the society.

Ethiopia is regarded as one of the biodiversity hotspots of the world. It is home to various fauna and flora which give local farmers diverse agro-ecology with immense benefits (Kelbessa, 2015). One key contributor to such biodiversity conservation in the country is the Ethiopian Orthodox Church which is one of the oldest churches in Africa. The Church is renowned for its long history of protecting indigenous forests. There are also many cultural and sacred landscapes in the country that are devoted to ritual and religious purposes (Maru et al., 2020).

The Gedeo agroforestry is a product of Gedeo indigenous knowledge which is an integrated part of the Gedeo culture and belief systems (Getachew and Abiyot, 2017). According to a Gedeo traditional rule called *Serra*, plants and animals are, like humans, part of nature and created by *Megeno* (God), and, as a consequence, should be respected. Nature is also considered as an intermediary between God (*Megeno*) and human beings, and should be protected for cultural and economic purposes (Maru et al., 2020). The Gedeo *Balle* system (Gedeo traditional administration system) has its own principles and philosophy used to regulate people's activities and nature.

The ethics of care and respect are an essential tool for moulding a traditional understanding of environmental protection and conservation of nature. Any forms of overexploitation of nature and transgression of the traditional rules related to conservation are considered serious infringements of the community's values resulting in punishment by the elders (Maru et. al, 2020).

### **Population and study sample selection**

According to Getachew (2014), Gedeo Zone has three agro-ecological zones: 30% of the Zone is highland, 67% is midland, and the remaining 3% is lowland. Thus, this research purposefully focused on the predominant midlands where an indigenous production system with simple tools and low external input is used. Dilla Zuria, Wonago and Yirga Cheffe *weredas* (districts) were selected in the midland agro-ecology where population density is high (more than 956 persons/km<sup>2</sup>) (CSA, 2012), and with the biodiversity in the agro-forestry being well preserved.

The fieldwork was conducted once a research permit was granted from Gedeo Zone Culture, Tourism, and Sports Office. Then, a selection of specific sites on the basis of the study objectives was made. After that, using judgemental sampling, key informants (experts from the cultural sector) were selected and contacted for data collection. For instance, interviews and focus group discussions were conducted on indigenous knowledge, biodiversity conservation and other topic-specific issues.

### **Sources of data**

#### ***Secondary sources of data***

The case study employed both primary and secondary data sources. Data about the study area was collected from different offices. In addition, published books, journal articles, conventions, and policy documents were used in the case study. These sources were used as secondary data sources to complement the primary data that was collected during the field work.

#### ***Primary sources of data***

This study is based on primary data and supplemented with secondary data sources. Primary data was collected during fieldwork using qualitative data-collection methods, namely, observation, interview, and FGD.

**Observation:** Observation is fundamental for the case study. With a purposeful, systematic, and selective way of watching and listening to an interaction or phenomenon as it took place, observation was conducted to learn about and collect data on topic-specific issues of indigenous knowledge, biodiversity conservation, human-environment relations etc.

**Interviews:** Unstructured and semi-structured interviews are the most widely-used methods in indigenous knowledge and cultural anthropology research (Bernard, 1995). Hence, in-depth interviews were conducted with key informants to understand the opinions, thoughts, and concerns of members of the selected communities in relation to indigenous knowledge, practices, and biodiversity conservation. Using an interview schedule, knowledgeable elders, traditional administrators and religious leaders, officials and agricultural extension workers were interviewed about indigenous knowledge and biodiversity conservation.



**Focus-group discussion:** A focus-group discussion (FGD) is an important method to generate data on issues which need group perspectives and consensus (Morgan, 1997). FGDs were conducted with various sections of the society. This helped to collect data which showed group views and perspectives about indigenous knowledge, scientific knowledge, safeguarding of indigenous knowledge, biodiversity conservation etc. During the fieldwork, audio-visual recorders were used to document the FGD data. Interviews and some activities were recorded to produce a five to ten minute video and some photos that show biodiversity-related views, ideas, and perceptions of the Zone communities.

### Data collection

Using the above research methods, qualitative data were collected from 2 April to 12 April, 2021. As indicated above, experts from Gedeo Zone Culture, Tourism and Sport Office, traditional administrators, elders and local community members were involved in the study.

### Data management

The collected qualitative data were managed according to the nature of the specific piece of data. All recorded tapes were transcribed and labelled with the informant's name, the date and place of interview, or FGD. Coding and categorization of information in themes should be part of data management (O'Reilly, 2009). Thus, all the data were categorized and coded based on the objectives of the case study.

### Data-analysis strategies

In this case study a theme-analysis method was employed in which all the qualitative data were primarily categorized into sub-themes and then developed into major themes for discussion. In the process, each sub-theme was categorized in relation to the research objectives. Specifically, a thematic analysis which focused on searching for relationships among the domains (Spradley, 1979) was used to analyse the relationship found between indigenous knowledge and biodiversity conservation.

### Ethics considerations and human rights issues

Ethical problems are becoming serious in human behavioural research (Bernard, 1995). To safeguard the interests of the studied communities, ethical issues were made to receive particular consideration throughout the fieldwork. Proper channels, formal bureaucracy, as well as traditional administration systems were used to get access to the study area. Due consideration was given to respecting the cultural values of the communities. Free, prior, and informed consent of informants was requested for conducting the personal interviews and FGDs. Audio and video recordings were made after permission was granted by the informants. Permission was also sought for making videos and photos accessible to the public.

### Strengths and limitations of the case study

This case study, like any other studies, has its own strengths and limitations. In fact the study has three major strengths: (1) it shows how indigenous knowledge is vital for biodiversity conservation; (2) it demonstrates the nexus between indigenous knowledge, biodiversity conservation and sustainable livelihood; and (3) it shows the interrelation between tangible and intangible cultural heritages. The limitations of the case study stem from its nature and

the current situation in the study area. A case study by nature is a complex endeavor that requires a longer period of fieldwork and a multi-disciplinary research team. However, the fieldwork in this study was limited to only ten days due to financial constraints. The same factors also prevented the involvement of more multi-disciplinary personnel in the research team. On top of that, the global COVID-19 pandemic restricted the movement of informants and limited the gathering of people, negatively affecting the fieldwork.

### Findings

The findings of this case study are mainly based on the primary data that were categorized into three major sections: indigenous knowledge system, biodiversity conservation, and challenges of indigenous knowledge and biodiversity conservation.

#### Indigenous knowledge system

Gedeo people's knowledge of agroforestry and biodiversity conservation has been transferred from generation to generation. According to the Gedeo's oral tradition, Derasso, who was the founding father of the Gedeo people, acquired such knowledge from his father and transferred it to his descendants. A family is the basic component for the indigenous knowledge transfer and acquisition which is considered as a part of the socialization process upheld and conducted by the communities of the Zone. *Songo* (traditional administration at a village level) is the second place after family through which indigenous knowledge, especially rules and values, are acquired. Usually, children go to the farmland at an early age to get practical knowledge from parents and/or elders. The knowledge acquired is cumulative knowledge which is continuously transferred over the generations. In addition, each generation adds its own experience and transfers the enhanced knowledge to the next generation. This makes the Gedeo indigenous knowledge cumulative and dynamic. There is also a possibility of adaption of external knowledge by indigenizing and fitting it to the local situation.

In the process, the Gedeo acquire knowledge about biodiversity management, classification of ecological elements, soil fertility, water management, weather forecasting, and the nature of plant species in the agroforestry. When a father gives a piece of land called *ansho* to his newly married son, he has to make sure that the son has the requisite knowledge to conserve the biodiversity and sustain the agroforestry on his farmland.

As to the disparities in indigenous knowledge possession, Getachew (2014) argues that indigenous knowledge is not evenly distributed among the members of the Gedeo society; it rather varies based on gender and age. For instance, males have relatively better knowledge about tree growing, coffee clones and weather forecasting mechanisms. On the other hand, females have better knowledge about enset clones, enset processing, and soil-fertility maintenance mechanisms. The difference is a reflection of the household division of labour and an individual's access to a certain type of knowledge. In addition, there is knowledge variation based on age groups in both sexes, for example knowledge of weather forecasting is acquired later in life. This implies that elders are quite knowledgeable and able to employ their advanced management and interpretive skills which makes them powerful in the community.

Most informants explained that the Gedeo indigenous knowledge is complementary with scientific knowledge. For instance, indigenous soil-fertility enhancement methods, such

as using traditional compost, leaf litter or vegetation cover, are very similar to the scientific methods. Moreover, farmers argued that their local knowledge about biodiversity conservation and managing different plantations in different canopy levels of agroforestry is better in their local context. They further contended that their indigenous knowledge is effective and productive in sloppy areas and the knowledge is tested and proven over long periods of time. Our observation and interviews with development agents (government-assigned agricultural workers) and farmers have shown that the conventional land-management system that was being practiced in the agroforestry landscape is mostly customized to the already established indigenous land-management practices. The development agents, who are assigned to support the local people, often capitalize on the already established land-management practices.

In general, the Gedeo believe that their environment is a result of their indigenous knowledge, and an individual's work could be effective when it is supported by such knowledge. In short, the Gedeo biodiversity management system in the agroforestry is endowed with detailed indigenous knowledge about plant species and farming methods.

### **Gedeo biodiversity conservation**

The Gedeo biodiversity conservation practices reflect their worldview about the natural environment. As Berkes (2008) states: 'A worldview shapes environmental perceptions and gives meaning to observations of the environment'. Worldviews are deeply rooted in religion and include interpretations of observations and environmental ethics in our world (Berkes, 2008). Mwade (2011) also explains that variations in environmental perceptions, interactions, and knowledge among different peoples in the world depend on divergence in worldviews and environmental ethics. The Gedeo worldview is related to their traditional religion. The local people believe that *Mageno* (God) is the creator of everything including the sky and the earth. He created the hills, mountains, rivers, plants, animals, humans and all other creatures. The relationships among these beings are based on ontological principles of wholeness and relatedness. According to local perceptions, all the entities are interrelated and dependent upon each other (Getachew, 2017). As a result, the people respect nature, including plants and animals.

All environmental values emanate from the people's worldview, and they are related to their livelihood activities and indigenous knowledge. The major environmental values of the Gedeo people include respect, reciprocity, balance and sustainability (Getachew, 2017). This implies that nature, humans, and religion are highly interrelated. Consequently, farmers in Gedeo are restrained from activities that negatively affect the natural community and natural processes. For instance, according to the informants, cutting trees is discouraged in general and more so when it is done at the flowering stage, which is considered a sin. The same is true about the killing of pregnant animals. The Gedeo condemn it because they believe it is an interruption of the reproduction process that would anger the spiritual powers and deny humans access to such resources. Also, owing to their socio-cultural values, there are different trees which are not subject to cutting.

Biodiversity in the Gedeo is conceived as the totality of nature; more specifically, it represents plants and animals. The people conceive of biodiversity as God's creation and they strongly believe that misuse of parts of it is regarded as transgressing the will of their *Magano*. In addition, *Derasso*, the founding father of Gedeo, was blessed by his father to cultivate land by conserving the natural environment. So, their activities are based on using resources with a conservation principle. To this

end, the Gedeo has a traditional administration system called the *Balle* system, which has at the top of the office *Abba Gada* and *Songo* at the village level. This traditional administration system implements a traditional rule called *Serra*. Social sanctions are used as a means of reinforcing the decisions of the traditional administrators. Basically, the Gedeo agroforestry, which is the pillar of their biodiversity, is based on this traditional administration system that provides values, rules, general principles, and environmental ethics.

Mutual ecological co-existence, which is rooted in the indigenous knowledge, values, and customs of the people, is the approach that is followed by the Gedeo people. In Gedeo, a human-nature interaction seems to be inextricable and reciprocally constituted (Debelo et al., 2017). Their principle is that they protect nature, and in return nature will pay back. For instance, they have a cultural practice in which they nurture emerging plant seedlings – called *Baboo* – which literally means 'progeny'.

The Gedeo landscape is an evergreen landscape in the southern part of Ethiopia that reflects positive human-environment interaction. The landscape hosts diverse species of plants and animals. The Gedeo agroforestry is believed to have evolved through the modification of natural forests in a way that is suitable for human habitation. That is believed to help in maintaining biodiversity, unlike clearing forests for mono-cropping. Such a practice has enabled the creation of landscapes in the Zone with diverse, tall, and woody species giving them the look of a natural forest. The landscape features a traditional agroforestry system, sacred forests, and ritual places which are endowed with diverse species of plants and animals. Studies have shown that the agroforestry system is identified as a tool to preserve diversity of rich species around the world (Borkhataria et al., 2012; Hemp, 2001).

The traditional agroforestry system of the Gedeo is a hotspot for biodiversity conservation. The system hosts as many as 50 woody plant species belonging to 35 families in each plot of 100m<sup>2</sup> (Degefa, 2016). This implies that the Gedeo agroforestry system is immensely rich in its biodiversity, and this can be attributed to the people's indigenous knowledge, their culture towards management and conservation of agroforestry systems.

In the Gedeo agroforestry system, indigenous trees and agricultural crops are arranged sequentially in time and space. The system is mainly composed of an organized mosaic of crops starting from annual herbs at the lowest canopy through to medium-aged enset and coffee (30 years), and extending to medium canopy and long-living, multi-purpose tree varieties at the upper canopy (Kanshie, 2002; Mebrate, 2007; SLUF, 2006). It is a multi-purpose system in which trees are arranged in a relatively high degree of species diversity and planted in a dense manner with a general multi-strata structure (Kanshie, 1994; Nigussie, 2008). Maintaining biodiversity using knowledge of succession management is vital for the suitability of agroforestry in Gedeo. In the management of species at different canopies, particular attention is given to balancing trees with other plantations and to the succession management of particularly trees such as coffee and enset. If a farmer fails in succession management, he and his family may be exposed for food and cash shortages in one year and a surplus production in the other. Thus, the knowledge of biodiversity management is a question of survival and hence succession management is carried out with the principle of sustainability in mind. SLUF (2006) and Kanshie (2002) also noted that biodiversity management can be one of the most efficient and sustainable land-use systems in a country.

The social environment is also supported by the existence of different trees and other plantations on a farm. If someone is found to have poorly managed his farm or abused the natural environment, he may be advised by elders with the view that failing to heed the advice is tantamount to facing social sanctions. On the other hand, if someone has managed his farmland well, he will get due respect from the members of his community. In the Gedeo custom, cutting big trees is not an individual decision. It is, rather, an issue to be decided by the family members and one's kin. If agreement is reached and the cutting is to be conducted, it is usually done with solemn prayers.

In addition to agroforestry, there are protected and sacred forests where biodiversity is preserved in the community. For example, there is a protected area called Ejersa Woyota in the Yirga Cheffe area. The forest has different types of indigenous trees. This is a place of rituals where it is believed that God answers the prayers of the people. Due to such a belief, the place is so sacred that no crop harvesting or collection of wood is carried out there. It is also forbidden to hunt animals in this area, so there are many different types of animal species. Only selected elders are allowed to enter the forest. This implies that thanks to the *Balle* system and the traditional religion, the biodiversity is greatly protected in the area.

Gedeo is a land where humans, domestic animals, and wild animals live in the same ecosystem. Domestic animals, especially sheep and cattle, are part of agroforestry; where they get their fodder and they, in turn, contribute to soil fertility. In addition, there are different wild animals like hyenas, colobuses, apes, and a great variety of birds. The Gedeo consider wild animals as God's (*Megenos*) creations, and thus they have a right to live. Some bird species are used to predict the future, so the killing of such birds is considered as a taboo and a sin.

Gedeo farmers realize the importance of biodiversity conservation in the agroforestry. Such an understanding emanates from the fact that, thanks to conservation, it is possible to get good produce from a small plot of land. Trees in the agroforestry provide shade from sunlight and a cover from snow for coffee plantations. They also enhance soil fertility and prevent soil erosion which leads to the production of the world-renowned Yirga Cheffe organic coffee. Moreover, trees are important for their ecological service. That is, the Gedeo believe that the conservation of biodiversity results in the necessary amount of timely rain that is crucial for good agricultural yields. The contacted farmers also asserted that fertile soil and various plant species can help to drain rain water into the ground which in turn makes the area rich in rivers, springs, and ground water. Most of the farmers argued that life expectancy in the Gedeo area is high thanks to the clean air provided to them by the presence of great biodiversity and agroforestry in their locality. The agroforestry is also rich in herbal medicinal plants useful for humans as well as domestic animals. In addition, various trees are used for house construction and fire wood. Some selected tree leaves are used as fodder for domestic animals. Honey production is another engagement which has benefited a lot from the biologically diversified agroforestry in the Gedeo Zone. Furthermore, the agroforestry and some trees are used for ritual purposes.

### **Challenges of indigenous knowledge and biodiversity conservation**

The challenges of biodiversity conservation in Gedeo Zone are related to challenges of indigenous knowledge because both are intertwined. One of the most pressing challenges is the expansion of modern religions. As the interviewees and focus group members pointed out, the introduction of Protestant Christianity in the 1940s and its onwards expansion resulted in the decline of the

number of traditional religious followers. The decline has been dramatic since the Ethiopian People's Revolutionary Democratic Front (EPRDF) government came to power in 1991. This is because during the *Derge* (military rule) period (1974–1991) the government had put more pressure on Protestant Christianity than on the traditional religions. In the EPRDF period, Protestant Christianity was the only religion which grew by 69.3 per cent, according to censuses from 1994 to 2007. On the other hand, the number of traditional religious followers plummeted by 67.6 per cent (Getachew, 2014).

People are now disregarding traditional belief systems, that are essential to manage landscapes with important biodiversity, due to their religious views. Some of the practices are considered to be against biblical teachings, and thus people have abandoned them. Nowadays, elders are not able to use sanctions as they once did when local people transgressed their laws and traditions. People cut trees indiscriminately (older and younger trees) for fuel wood, timber and charcoaling, as they have developed a belief that nothing will happen to them for cutting indigenous trees without permission from the traditional elders. In the past, the local people would plant an indigenous tree known as *Erythrinabrucei* to mark graveyards of their relatives, family members and beloved ones. This practice has been abandoned and replaced by using tombstones as graves. This is mainly due to modern religious teaching.

The *Balle* system is one of the traditional practices used for the preservation of biodiversity and indigenous knowledge. Due to the expansion of Protestant Christianity and the belief that traditional belief systems and practices are against that religion, the *Balle* traditional administration and belief system is seriously weakened in the area.

Population pressure is posing another critical challenge to the sustainability of agroforestry/ biodiversity conservation. Human population is increasing at an alarming rate and putting immense pressure on the existing limited resource – land. Land is becoming the scarcest resource in the area. The average household landholding is less than 0.05 hectares per household, in some places dropping to 0.25 hectares while the national average landholding is 1 hectare per household. This contributes to the loss of biodiversity and land fragmentation. In addition, this means that young people feel they have little hope of getting farmland, pushing them to lose interest in indigenous knowledge and to migrate to urban centres in search of better job opportunities.

Most of the youth consider indigenous knowledge as backward thinking and inferior to conventional science. This makes the transfer of indigenous knowledge to new generations extremely challenging. As a consequence, the youth rarely go to the *songo* where the Gedeo learn cultural values. Such misunderstanding and lack of awareness about the significance of indigenous knowledge and the possibility of applying both types of knowledge systems in appropriate ways is holding back progress in the transfer and maintenance of the knowledge.

The expansion of Khat (*Catha edulis*) and eucalyptus tree produce as great income sources is another cause for biodiversity loss in the areas. Consequently, in some areas of the Zone the agroforestry landscape is being converted to Khat plantation. With the goal of getting better economic returns, the local people are also planting eucalyptus trees close to agroforestry lands. These two relatively new practices are promoting mono-cropping and increasing the loss of biodiversity in the Zone.

Commercialization of fuel wood, timber, and charcoal is another important factor contributing to the loss of biodiversity in Gedeo Zone. Government bodies are responsible for controlling logging in the area. However, loose government control and the high price of wood products are contributing to the cutting of trees, and hence loss of biodiversity. It has become customary to see piles of wood on the sides of roads, even in the remotest parts of the Zone. Furthermore, expansion of urban centres in and around the Zone is posing additional threats to the existing biodiversity.

## Conclusion

The findings of this study reveal that the Gedeo have extensive and well-developed indigenous knowledge which is both cumulative and dynamic. It is accumulated knowledge transferred from previous generations and harmonized with the newly generated knowledge of the present generation. The newly generated knowledge enriches the accumulated knowledge and is transferred to the next generation. This implies that the indigenous knowledge of the Gedeo is constantly evolving through the addition of new internal ideas and accepted external ones. The newly introduced external knowledge and the generated internal knowledge are accepted based on their practical and economic viability (Getachew, 2014).

The Gedeo use their worldviews to frame their environmental values, practices, and indigenous knowledge. The indigenous knowledge enables farmers to manage the local ecosystem in a sustainable way. The management is holistic and integrated; it involves soil fertility management, succession management and managing of agroforestry at various levels. The management of agroforestry requires not only diversified knowledge of every element in it but also the interrelations amongst the elements. Thus, the Gedeo agroforestry and cultural landscapes, which are considered as the identity pillars of their survival, are the product of their indigenous knowledge.

Indigenous knowledge is so deeply embedded in the culture that the people are unconscious of its practical ecological benefits (Mokuku and Mokuku, 2004). This study found that managing biodiversity is a basic aspect of indigenous knowledge and sustainable livelihoods in midland Gedeo. Indigenous knowledge, biodiversity conservation, and agroforestry are highly interrelated components in Gedeo Zone. Efforts to conserve the agroforestry and biodiversity by the Gedeo are the result of their indigenous knowledge. The biodiversity exists within the agroforestry. Conversely, the agroforestry and biodiversity are the pillars of the indigenous knowledge because the knowledge depends on the natural environment, which is used to encode it. Furthermore, the indigenous knowledge, which is an intangible cultural heritage, has shaped the Gedeo cultural landscape, which is a tangible cultural heritage. This interesting aspect of the Gedeo cultural heritage is included in the Tentative List of UNESCO World Heritage sites. Therefore, the government and the concerned communities, groups and individuals should preserve the indigenous knowledge, biodiversity, and livelihoods which are interrelated for the sustainability of the local ecology of the Zone.

## Recommendations

The Gedeo are known for their indigenous knowledge and biodiversity conservation, which has helped to sustain the livelihoods of generations of people. However, the knowledge and biodiversity are facing clear threats from different angles. Population pressure, schooling,

modernization, expansion of modern religion, expansion of mono-cropping, commercialization, and expansion of urban centres are among these challenges contributing to the loss of biodiversity and indigenous knowledge in the Zone. Some of these challenges are addressed at a local level by taking appropriate measures, while others demand large-scale policy-level implementation. Based on the data analysis and the findings of the study, the following recommendations are therefore made to help preserve indigenous knowledge and conserve biodiversity in the Zone.

- Indigenous knowledge transfer of biodiversity conservation and other related aspects is important for the viability of the intangible cultural heritage. The knowledge transfer is related to meeting the interests of the youth and enhancing the respect given to elders and their knowledge. Work should be done on enabling the youth to understand the importance of indigenous knowledge.
- Strengthening the *Balle* System should be given due attention. The Gedeo *Balle* system is an important practice for the transfer of indigenous knowledge and conservation of biodiversity. The system was robust before the imperial period, at the end of the 19<sup>th</sup> century. However, it started to be eroded after that time. Since 1991, there are signs that the system has been strengthened. Nonetheless, further support is still needed to maintain the traditional values, indigenous knowledge, and biodiversity conservation mechanisms embedded in the system.
- Biodiversity conservation efforts need to be strengthened. Biodiversity conservation in the agroforestry is essential for Gedeo livelihoods. Such preservation is possible by strengthening traditional values and controlling commercial logging by involving local communities and through encouraging the *Baboo* value that focuses on plantation of indigenous trees and preservation of biodiversity.
- Indigenous knowledge should be included in the school curricula. One important means to sustain indigenous knowledge is including the knowledge in the school curricula. This helps the youth to understand the significance of the knowledge, so that they will bring about attitudinal changes regarding it. They should also be taught about the complementarity between indigenous knowledge and scientific knowledge. Efforts should be made to use indigenous knowledge alongside scientific knowledge. This can be done by integrating indigenous knowledge in biodiversity conservation policies and strategies, as it has been repeatedly advocated by the leadership of IUCN at an international level (Hanes, 2006).
- There needs to be research, documentation, and dissemination/promotion work. Not much research has been undertaken concerning the Gedeo indigenous knowledge. Thus, studying various aspects of Gedeo indigenous knowledge, especially in relation to biodiversity conservation, is vital to enhance the value of the knowledge. Documenting the knowledge is important to transmit it to the next generation and other interested audiences. Furthermore, disseminating and promoting the knowledge is helpful so that all concerned bodies will be made aware of the significance of the knowledge and hence they will be motivated to give attention to it.
- There should be some work on awareness creation. Creating awareness about the impact of religion on indigenous knowledge should be made through symposiums, conferences and discussions with religious leaders. Annual festivals like *daararo* (Gedeo thanksgiving) can serve as a good platform to introduce the impact of modern religion on the agroforestry landscape.
- Looking for alternative and diverse livelihood sources should be a priority area. In order to account for loss of indigenous trees due to poverty and land fragmentation, other means of diversifying the livelihoods of the local people should be sought.

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## Summary of the case study

The Gedeo indigenous knowledge, which is an element of its intangible cultural heritage, is embedded in the culture of the society. The knowledge is acquired by a family as part of its socialization process. The Gedeo indigenous knowledge is cumulative and dynamic, and highly connected with the livelihoods of the locals and their biodiversity conservation activities. Gedeo biodiversity conservation mechanisms are driven by their worldview which considers humans and other natural elements as creations of Megeno (God). The traditional administration practice called the Balle system is also connected to indigenous knowledge and biodiversity conservation. Environmental ethics, values, and practices stem from the people's worldview and are managed by the Balle system, which has a reinforcing mechanism.

With proper management of the indigenous knowledge, the Gedeo agroforestry evolves from the natural forest. This has resulted in great biodiversity in Gedeo Zone and made it a biodiversity hotspot with diverse species of plants and animals. The Gedeo people conserve the biodiversity using their indigenous knowledge which in turn results in sustainable livelihoods and environment.

However, the indigenous knowledge and biodiversity conservation practices have faced challenges of sustainability. Expansion of Protestant Christianity, population pressure, weakness of the Balle system, lack of interest in indigenous knowledge and an increase in commercial logging are all identified in the study as major challenges. To address these challenges work needs to be done on, among other things, transfer of the indigenous knowledge, awareness creation, documenting and including the knowledge in the school curricula, and using the indigenous knowledge complementarily with scientific knowledge.

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Gedeo Zone is an evergreen area with the agroforestry (Photo credit: Getachew Senishaw)



Songo at village level is the second place of indigenous knowledge transfer (Photo credit: Getachew Senishaw)



Knowledge transfer from parents to children is part of socialization process (Photo credit: Getachew Senishaw)



The existence of different plants at different stages in the agroforestry ensures sustainability (Photo credit: Getachew Senishaw)



Wild animals are part of the Gedeo biodiversity (Photo credit: Getachew Senishaw)



Domestic animals are part of the biodiversity (Photo credit: Getachew Senishaw)



Ejersa Woyota sacred forest in Yirga Cheffe is one of biodiversity hotspot area (Photo credit: Getachew Senishaw)



Beekeeping is part of the Gedeo agroforestry (Photo credit: Getachew Senishaw)





Commercialization of fuel wood negatively affects biodiversity (Photo credit: Getachew Senishaw)



Planting only eucalyptus tree is a challenge for biodiversity (Photo credit: Getachew Senishaw)

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# Kenya

## Role of Indigenous Knowledge and Practices in Biodiversity Conservation, Climate-Change Adaptation, and Disaster Risk Reduction Among Pastoral Communities in Kenya

National Museums of Kenya (NMK)

Dr Peris Kariuki



Photo credit: ECCS-NK Project

## Summary of the case study

Climate change has altered the rules of the game of survival forcing man and science to look back and appreciate local and indigenous systems that have helped communities survive in extreme environments. In Kenya, pastoralists living in arid and semi-arid regions are already feeling the impacts of climate change since the regions they occupy are becoming increasingly more hostile with each passing day. To combat this constant change in weather patterns, information and intimate traditional knowledge, an intangible cultural heritage, is of great importance.

Intangible cultural heritage is the practices, representations, expressions, knowledge and skills – as well as instruments, objects, artefacts, cultural spaces associated therewith – that community groups, and in some cases individuals, recognize as part of their cultural heritage. This cultural heritage is transmitted from generation to generation and keeps changing (is recreated) in response to the environment, interaction with nature and history.

Indigenous knowledge has helped communities to live in harsh environments sustainably, even before humanity. This knowledge is threatened by the passing on of the custodians with age. The transmission of this tacit knowledge was through oral tradition, experiential and apprenticeship for more specialist knowledge. The passing on was interrupted and hampered gradually by different forces, among them formal education, statutory law and religion all of which have interfered with its transmission.

For centuries, pastoralists have survived these harsh climatic conditions since their livelihood has been guided by philosophies and skills developed over a long period. Their indigenous knowledge systems enable them to hone skills essential in interacting with their natural surroundings. Climate change has altered the rules of the game of survival forcing man and science to look back and appreciate local and indigenous systems that have helped communities survive in extreme environments.

In Kenya, pastoralists living in arid and semi-arid regions are already feeling the impacts of climate change since the regions they occupy are becoming increasingly more hostile with each passing day. To combat this constant change in weather patterns, information and intimate traditional knowledge, an intangible cultural heritage, is of great importance.

## Introduction

Pastoral communities throughout the world occupy areas with harsh climatic conditions. They either live in extremely cold environments, often with severe winter events, or in dry areas that often experience excessive droughts and occasional flooding. The precarious pastoral environments necessitate a good understanding of the spatial and temporal changes in climate, environmental, and social conditions to inform timely responses and to enable mitigation of the adverse impacts of stressors. Accurate early warning information is therefore critical to help pastoralists cope with and recover from natural disturbances.

Over 80% of Kenyan land is arid or semi-arid, in these environments water is the limiting factor of production. Pastoral communities occupy a large area of this land. To survive in these arid

and semi-arid areas requires intricate knowledge and understanding of the conditions. However, their ability to survive has been challenged by climate-change phenomenon compounded by increase in population, changing land use and land ownership and restriction of movement and insecurity thus resulting in losses of livelihoods through death of livestock.

## The purpose and objectives

The purpose of this study was to document linkages between intangible cultural heritage (ICH) and biodiversity conservation, climate change and/or disaster risk reduction. The study provides valuable insights of indigenous knowledge systems, oral traditions, cultural expressions, rituals and practices contributing to biodiversity conservation, climate-change adaptation/mitigation, and/or disaster risk reduction in northern Kenya. The study further underlines the threats and safeguards to protect the indigenous knowledge system/practice from the impacts of climate change and suggest possible mitigation measures.

The aim of the study therefore was to assess the role of indigenous knowledge and practices in biodiversity conservation, climate-change adaptation, and disaster risk reduction among pastoral communities in Kenya. The specific objectives included;

- a) Describing knowledge systems and how they are affected by and/or adapting to climate change
- b) Identifying safeguarding measures for these knowledge systems in view of compounding challenges to ensure transmission to future generations
- c) Identifying opportunities for interplay and complementarity of indigenous knowledge systems and conventional scientific knowledge for support.

## Ethical considerations and human rights issues

In line with the documentation of indigenous knowledge, a prior informed consent form was prepared and signed on behalf of the respondents by the leader in the group, who also acted as the research assistant (Appendix 1). The research was carried out during the Ramadhan, and therefore there was limited time to undertake the study.

## Strengths and limitations of the case study

The research team had prior working relationship with the community and were therefore culturally conscious. The research team benefitted from knowledgeable research assistants from the local community. This study was carried out during the Covid-19 pandemic period and when travel restrictions had been imposed. This delayed the work and also meant that some of it had to take place virtually, therefore limiting its effectiveness.

Borana community occupies Isiolo and Marsabit Counties yet this study was only undertaken in one Ward (in Garbatula, Sub-county) due to limited time and financial resources for wider coverage.

## Methodology

### Study area

The study focused on Kinna ward, Garbatula sub-County of Isiolo County. Isiolo County is one of the 23 semi-arid Counties in Kenya (see figure 2). The dominant inhabitants of the County include the Borana, Samburu, Turkana, Somali, and Meru. Other Kenyan communities are found in urban centres who are mainly involved in businesses. With the exception of the Meru community, all the other dominant communities are pastoralists or agro-pastoralists. The IKS is, however, shared amongst the Borana communities both in Kenya and Ethiopia.

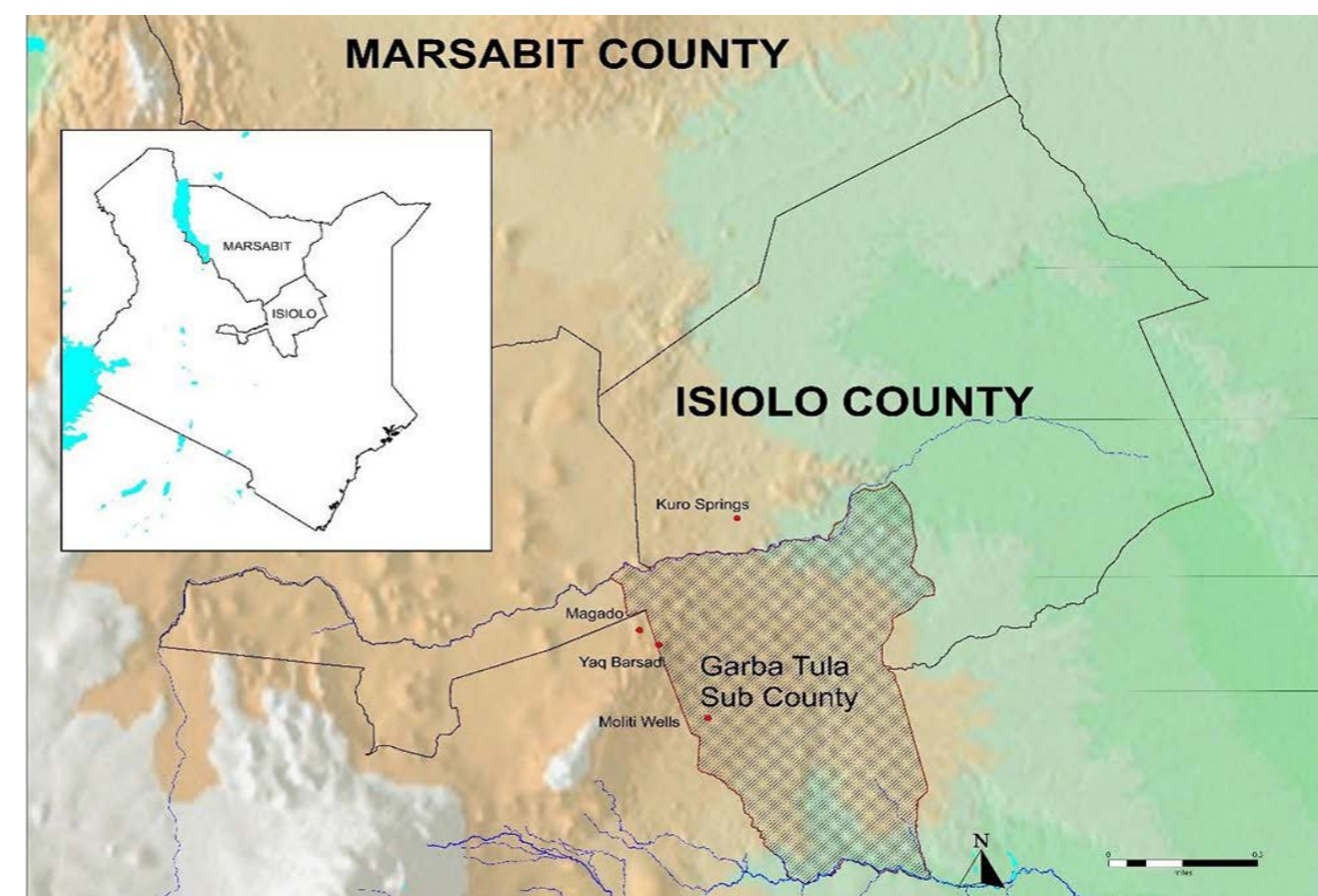


Figure 2: Map of Isiolo County, showing Garbatula Sub-County- study location

## Research design and methods/procedures

### Study area

The study focuses on Kinna ward in Isiolo County. The IKS is, however, shared amongst the Borana communities both in Kenya and Ethiopia.

### Methods

A number of methods were used to collect data for this study. A 'desktop literature review' on the Borana community, their governance system and traditional institutions such as *Deddha* structure on range management was done. We also collected primary data through focus group discussions where climate change adaptation measures and biodiversity conservation practices were documented. Two focus group discussions were carried out, one each for men and women. Each group consisted of five members (Figure 3).

In addition, key informant interviews were carried out where fourteen informants. They consisted of nine men and five women and were mainly elderly, knowledgeable members of the community. All the interviews were carried out by a local research assistant using the local dialect which was then translated into English. The researcher's experience, from previous interaction with the community through other projects and participant's observations were also used to enrich the research. Video and photography were also used to capture the environment and the livelihoods of the people in view of climate change hazards, community adaptation knowledge and *Dedha* governance system.

The qualitative data collected was subjected to thematic and content analysis based on the research questions that the study sought to address.

## Results and Discussion

### Knowledge system and climate change

The Borana are a pastoral and agro-pastoral Cushitic community that migrated from Horn of Africa into Kenya from Ethiopia. They are a sub-ethnic group of the Oromo-speaking people residing in northern Kenya and southern Ethiopia. In Kenya, the Borana people are mainly found in Marsabit and Isiolo Counties. The Borana have a centralized governance system called *Gada* – a system of age grade classes (*Luba*) that succeed each other every eight years in assuming military, economic, political and ritual responsibilities. They also have the highest organ, the *Gumi Gayo*, where rules and regulations pertaining to the community's wellbeing are created, reviewed and/or amended and enforced.

To survive the harsh environmental and economic conditions, the Borana community over the years has accumulated traditional knowledge on natural resources availability in space and time, opportunities and threats to their livelihoods, including impacts of climate variability and change. This knowledge has been transmitted orally from generation to generation, through experiential learning, apprenticeship, and/or various traditional rites and cultural expressions such as music, drama, worship and ceremonies.

The County of Isiolo and northern Kenya in general has over the past three decades, experienced significant increase in climate-change hazards. Notable climate-change hazards in the region include water and pasture scarcity, prolonged droughts, loss of livestock, hunger and famine, flooding and land degradation. The Borana community, like most other pastoral communities living in harsh and uncertain environments, have learned and adopted mitigation strategies to survive and thrive.

### The *Deddha*

*Deddha/Deedha/Dhedha/Detha* is the Borana traditional natural resource-management governance body. They advise and guide communities on resource use, especially range resources, mostly water, fodder, watering holes and salt licks. Extreme weather conditions such as droughts and floods together with unsustainable anthropogenic activities such as charcoal making, deforestation for farming and overgrazing have led to loss of biodiversity thus compromising community livelihoods such as livestock keeping and crops production. To counter these adverse effects, The *Dedha*, based on indigenous knowledge accumulated over the years is instrumental in instituting environmental conservation, disaster risk reduction and in climate-change adaptation.

### Conservation of biodiversity

For a community to conserve they should have a reason or purpose for the item they are conserving. The Borana have various recognized consumptive and non-consumptive uses for biodiversity, which include trees, herbs and shrubs, insects and wildlife. Trees for instance play a major role in the lifestyle of the Borana community as source of food for humans, feed for livestock and wildlife, sources of medicinal herbs and spices, as well as cultural uses in ceremonies and rites. They also provide shade, raw materials for household items and the construction of shelters. Some of the trees are thus protected. The protection of useful wildlife, such as bees and birds is also important. Amongst the Borana it is taboo to kill wildlife, and if a community member did so they would be fined. This fine is locally referred to as *Karamata* (meaning head of a bull).

The Borana community knowledge systems have been built around their natural environment, that includes plants, animals, insects and even astrological objects. We have classified indigenous knowledge system as plant-based, and/or animal-based.

### Plant-based knowledge systems

The Borana community and most other communities that rely heavily on natural resources have developed a strong relationship with plant diversity, some plants are traditionally protected due to their food value, cultural value or a mixture of values. For example; the *Acacia tortilis* is a source of shade for elders' meetings and fodder for livestock, especially the nutritious pods (*sakaram*) during drought periods. The species is therefore protected.

Some species have come in handy as last resort source of energy during periods of prolonged drought and subsequent famine. *Dadacha* (*Adansonia digitata*) and *Badana* trees – plant parts, fruits, bark, leaves. Stem and roots – for food and fodder while *Qote* (*Tamarindus indica*) and *Urur* found along the riverine areas are cut and fed to shoats when most places have no pasture. *Qote* trees are protected for this purpose but also as source of food for wild birds. It is a taboo to fell a tree where birds are nesting because it is seen to be like a 'village' for the birds.

### Indicators

Some tree species are used as indicator species. For example, Doum palm (*Hyphene compressus*) is an indicator of high water table. The species leaves are used as roofing materials for traditional huts.

### Animal-based knowledge system

The Borana community have used animal behaviours to predict future weather patterns and have often instituted adaptation strategies to minimize negative impacts of bad weather. For example, the emergence of large flocks of weaver birds into homesteads (see figure 4) during the delayed rainy season (perhaps due to decline in food sources in the wild) is interpreted as sign of possible drought event. As messenger, these birds are often welcome to share food with humans. Some birds such as *Tumadhes*, are particularly respected as they warn people against impending danger. Women fetching firewood in the bushland value these birds because they warn them against attackers or approaching dangerous wild animals such as elephants.

Whenever the herders are watering livestock at boreholes or wells, they always leave behind the water troughs filled with water for the wildlife to drink at night locally referred to as *bisan nyencha warabesa* (water for the hyenas). The intention of this action is to avoid conflict with wild animals during the day while the livestock are watering.

### **Indicator species**

Like indicator plants, there are also indicator birds/insects/animals that community uses to locate a resource, avoid danger, predict weather conditions among others. The honey guide (*Awale*) bird is appreciated and protected by honey harvesters because they lead them into hives or bee nesting sites with mature honey. The honey harvesters often left behind some honey for *Awale* birds for the good job of identifying the sites. Similarly, the *Baqas* bird, when seen around the homestead, warns of impending enemy attack and as such the community prepares to defend themselves (see figure 4).

It is common to use wildlife or plants to identify and/or name places. For example, *Yaq Barsedi*, is a place named after the baobab tree. Dominant wildlife is also used to identify a site or act as a reference point for community activities.

### **Sustainable harvesting practices**

To guarantee the survival of species considered important in the community, beside rules and regulations instituted to protect these species, taboos were also used to discourage would be transgressors. For example, it is taboo to harvest the main shoot of any tree to avoid killing the plant, however one was allowed to pollard branches, to build houses and livestock sheds. Sacred sites or trees such as Baobab (*Adansonia digitata*), are also protected.

### **Sacred sites**

These are either areas with unique resources for survival and/or certain individual trees that are sacred such as **Ordha** (*Ficus glumolosa*), are also protected.

### **Prediction /early warning system/ adaptation to climate change/disaster risk reduction**

The Borana community has been able to adjust to climate variability and change by observing plants and animal behaviors to predict weather changes and prepare as necessary. The community observe plant phenology e.g. shedding of leaves, flowering of some plants, migration of some birds or insects among others to predict impending drought, onset of rainy season, as well as other events such as possible enemy attack. The community also uses cosmic indicators such as stars, shape and direction of the moon, and wind direction.

Weather prediction and assessment of the available range resources is very important responsibility among the Borana community. The planning and surveying/scouting of pasture and water (called *Shalfa* in local language) in different places and landscapes in order to inform decision making (such as livestock mobility) is critical knowledge for the community. Often livestock mobility in search of pastures and water involved subdivision of the herd into *Hawich* (home herd) and *fora* (away from home herd). The *Hawich* herd provide milk for the families, and are managed by the women and children. The women will search for tubers and any available forage including harvesting birds' nests to feed these animals and ensure they survive while the weak animals and calves are slaughtered for food.

The *Fora* herd, which is bigger, will move with the men and warriors to far distances places in search for range resources.

Pastoral livestock herds are composed of different species (cattle, sheep, and goats) to spread risks such as the outbreak of diseases as well as to maximize the rangeland resources given that different species prefer different foraging methods e.g. browsers (camels) versus grazers (cattle). They are also impacted differently by different climate change hazards.

To increase chances of livestock surviving through drought periods, often the community prevent mating that results in birthing during such times. This is done by castrating bulls and preventing conception of goats and/or sheep by fixing an apron that limits successful mating. If conception takes place and the mother's wellbeing is compromised, the young one is killed to increase mother's chances of survival. The significance of this action is expressed in Borana proverb '*Limen Qathatha*', meaning the lid of the calabash is not as useful as the calabash itself. The young ones are like the lid of a traditional wooden gourd and can be thrown away during hard times and replaced during good times.

### **Food diversification and preservation**

Due to the harsh and unreliable climate, the Borana community have developed skills for food preservation so as to store for lean times. For example, women process meat and dry it for use during the drought, when the livestock are away from homestead. The fried and dried meat can be stored for several months.

### **Pasture zonation**

The Borana community have zone their grazing land into wet season, dry season and drought reserve. Wet season grazing areas are often areas only suitable for grazing during wet season because they lack permanent water source. They often have temporary water pools and run out soon after the rain stops. These areas have lush and good quality pastures available for a short period of time. The dry season grazing areas often have permanent water source nearby. Drought reserve zone are areas left with dry standing hay only used during drought period. These areas also have permanent water source nearby. The Dedha regulate the use of these zones. Proper management of pasture during the good times is important and there are stipulated areas for grazing, for using boreholes and salt pans etc, to avoid overcrowding. For example at Moluti wells in Kinna.

### **Diversification of livelihoods and other strategies**

The Borana community have diversify their livelihood options over the years to cope with frequent droughts and subsequent food shortages. The Kinna community in particular have diversify into agro-pastoralism where they keep livestock at the same time grow crops especially along the river banks or under irrigation. Expansion of crop growing is common after severe drought where large herds of livestock die from starvation and contracts during years of good rains as community re-built livestock numbers.

In the recent past, the community have also embraced pasture production to supplement livestock or for sale during time of pasture scarcity (see figure 5 and 6).

Whereas pasture production is on a small scale, it indicates community thrive to adapt and minimize negative impacts of climate change hazards such as livestock deaths.

Occasionally the Borana community supplement their income from handicraft such as beadwork and basketry and in extreme conditions they may engage in charcoal-making activities. Wage employment as well as small scale business enterprises constitute some other adaptation strategies the community have embrace. Through some development agencies operating in the region, some self-help groups have been formed to undertake table-banking saving schemes to raise money for school fees, businesses and for emergencies

Whereas beekeeping has traditionally been practiced by the community, the use of improved beehives is a more recent occurrence (see figure 6). Bee keeping has been promoted as an ecofriendly way to ensure food security and earn income sustainably while conserving resources. With the promotion of biodiversity and ecosystem services, bee keeping as an income generating activity results in a win-win situation for economy and environment.

### **Safeguarding indigenous knowledge systems (IKS)**

The IKS faces threats from within as well as from external sources. These threats are not unique to the Borana community, but is common among many other communities that rely predominantly on natural resources for their livelihoods.

### **Threats to conservation and sustainability of the IKS**

The **Internal** challenges are the declining number of indigenous knowledge custodians through death. *Hayum* (traditional forums) for ended when elders stopped giving advice to the youngsters. Forums for passing on the knowledge for collective action by the community are almost non-existent. For instance, increasingly, the Borana community uses hired herders, some of whom are non-Borana. These hired herders have limited knowledge of herding skills, such as where to graze and at what time, good and bad indicators concerning the feed quality among other crucial skills. Inability to pass on this knowledge to the younger generation is a sure threat for its future survival. There is also a declining interest in indigenous knowledge amongst the youth due to ignorance, modernization or lifestyle changes, and lack of support by the elite in the community

**External** factors which pose a challenge to sustainability of IKS include non-supportive government policies for instance, the demarcation of counties, and even boundaries, and the privatization of land, is not in line with traditional grazing patterns as this was done without the community. This has led to intercommunity resource-based conflicts as 'new' boundaries does not respect the traditional grazing patterns and access arrangements. This has restricted livestock mobility and in turn compromise the knowledge associated with nomadic pastoralism.

Forced villagization policy during the Shifta conflict in Kenya, is attributed to significant loss of indigenous knowledge system in the then Northern Frontier Districts (Isiolo, Marsabit, Wajir, Mandera and Garissa). As a means to gain state control of the region government, forced communities into concentration camps, and many elders died thus disrupting people way of life. There is a saying among the Borana '*nami aba daqabat odhu akhau ihnkab*' which translate loosely to mean – if you met your father alive, you'll get information of your grandfather. This implies that with the death of many elders during the war, some valuable information about the community may have been lost.

Religion, both Islam and Christianity, also curtailed the transmission of indigenous knowledge from generation to generation. For instance, the 'reading' of the stomach entrails to predict future events is seen not to conform with religious beliefs and is therefore discouraged and outrightly outlawed based on the doctrine that the future belong to God.

Compulsory formal education has also had an effect, reducing the time young people are engaged in learning the indigenous knowledge from the elders. There is no longer time for the experiential learning and apprenticeship that was carried out often at homes and during outdoor activities such as herding, fetching water and firewood among others.

Prior to the enactment of Traditional Knowledge and Cultural Expressions Act (TK &CE Act 2016), there was no policy or legal framework to support nurturing and promoting the use of indigenous/traditional knowledge. The Witchcraft Act, Chapter 67 Laws of Kenya, was used by the colonial as well as post independent government administration to suppress indigenous knowledge in traditional medicine, sacred sites, and any other practices that administrators did not understand.

### **Some proposed safeguarding measures**

Given the threat and declining authority of traditional institutions that safeguards community interest, there is a need to institute measures to nurture and promote IKS to address present and future challenges. The surest way to preserve IKS is by making it a living practice. First and foremost, indigenous knowledge systems (IKS) must be documented and disseminated using relevant forums and in appropriate format. Opportunities to showcase IKS in practice as matter of priority MUST be identified and promoted. Revitalization of IKS transmissions forums for shared learning experiences with the youth and elders through storytelling, seminars, drama and music festivals in schools and colleges. Inclusion of IKS in the formal education systems as part of taught curriculum in schools is also an avenue to preserve this resource. The integration or linkages of scientific and indigenous weather forecasting techniques is also an opportunity to make IKS a living practice. The Institutionalization of traditional knowledge systems integration into development planning (e.g. county resource management committees) should be encourage and promoted as well.

### **Opportunities and challenges to conservation and sustainable utilization of IKS**

There is an opportunity for interplay or complementarity of indigenous knowledge systems and conventional scientific knowledge. Some of the areas where linkages opportunities include weather forecasting, in livestock and human medicine, in range management, paddocking, and forage/hay production. Additionally, there are opportunities for complementarity between the two knowledge systems in food preparation and preservation, conflict resolutions, and in livestock breeding.

### **Conclusions**

From this study we can conclude that indeed IKS plays a significant role in biodiversity conservation, climate change adaptation, and in disaster risk reduction among the Borana community. The IKS has aided the community to live in rather harsh environment with limited livelihood options. Both animal-based and plant-based IKS have regulated consumptive and non-consumptive use of biodiversity in this community whose livelihoods is predominantly based on natural resources. With the increasing climate variability biodiversity has provided the community with early warning system as well as nature-based solution opportunities for adaptation.

Like other communities Borana IKS is under threat from both endogenous and exogenous factors. Declining respect for traditional institutions and practices, dead of knowledge custodians, and changing lifestyles are some of the inherent threats to continues survival of IKS. Religion, formal education as well as unsupportive policies constitute some of the exogenous factors endangering the future of indigenous knowledge systems amongst communities. To safeguard IKS therefore demands that deliberate steps be taken both at community and at policy level to make it relevant to meet present and future challenges.

### Recommendations

- Documentation and transmission of ICH for posterity. The oral transmission route is no longer viable as a means of IKS transmission from one generation to the other, therefore there is a need for documenting and packaging the information using digital space or as performing arts to capture the youth. National and County government events and school programmes should be used as opportunities to showcase IKS. The full implementation of Traditional Knowledge and Cultural Expressions Act (2016; revised 2018) will go a long way in promoting IK.
- The establishment of centres of excellence where practices are continued as a 'living heritage' – for example in cultural centres, and cultural villages. In such places, key elements can be conserved and be re-enacted to keep them alive, such as storytelling.
- The conservation of sacred sites is also key in preserving both the knowledge and associated biodiversity and the custodians
- Integration or linkages of IKS with scientific knowledge provide impetus for its conservation.

### Annex1: Members of the National Team

	Name	Category /Constituency
1	Dr. Peris Kariuki	Kenya Resource Centre for Indigenous Knowledge, KENRIK, National Museums of Kenya (NMK)
2	Dr. Staline Kibet	University of Nairobi (UON)
3	Mr. Abdi Kulewa	State Department of Culture
4	Mr Hussein Tinde	Research Assistant Community
5	Ms Mercy Gakii	Cultural Heritage Science
6	Gabriel Boru	Cultural Officer Marsabit County
7	Mr. Njuguna Gichere	Directorate of Sites and Monuments

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Figure 3: Focus group discussion in Kinna, Garbatula Ward (Photo credit: SOAK project, UON)



Figure 1 - Chalbi desert northern Kenya (Photo Credit ECCS-NK Project)



Figure 6: Adaptation to climate change. Alternative livelihoods – bee keeping (Photo credit: SOAK Project, UoN)



Figure 4: Sharing food with birds - (birds allowed to feed from leftover food on a plate) in a Restaurant, Merti Town. (Photo credit: SOAK Project, UoN)



Figure 5: Adaptation to climate change. Alternative livelihoods – bee keeping (Photo credit: SOAK Project, UoN)





# Seychelles

## The Creole Garden and Kitchen Pharmacy

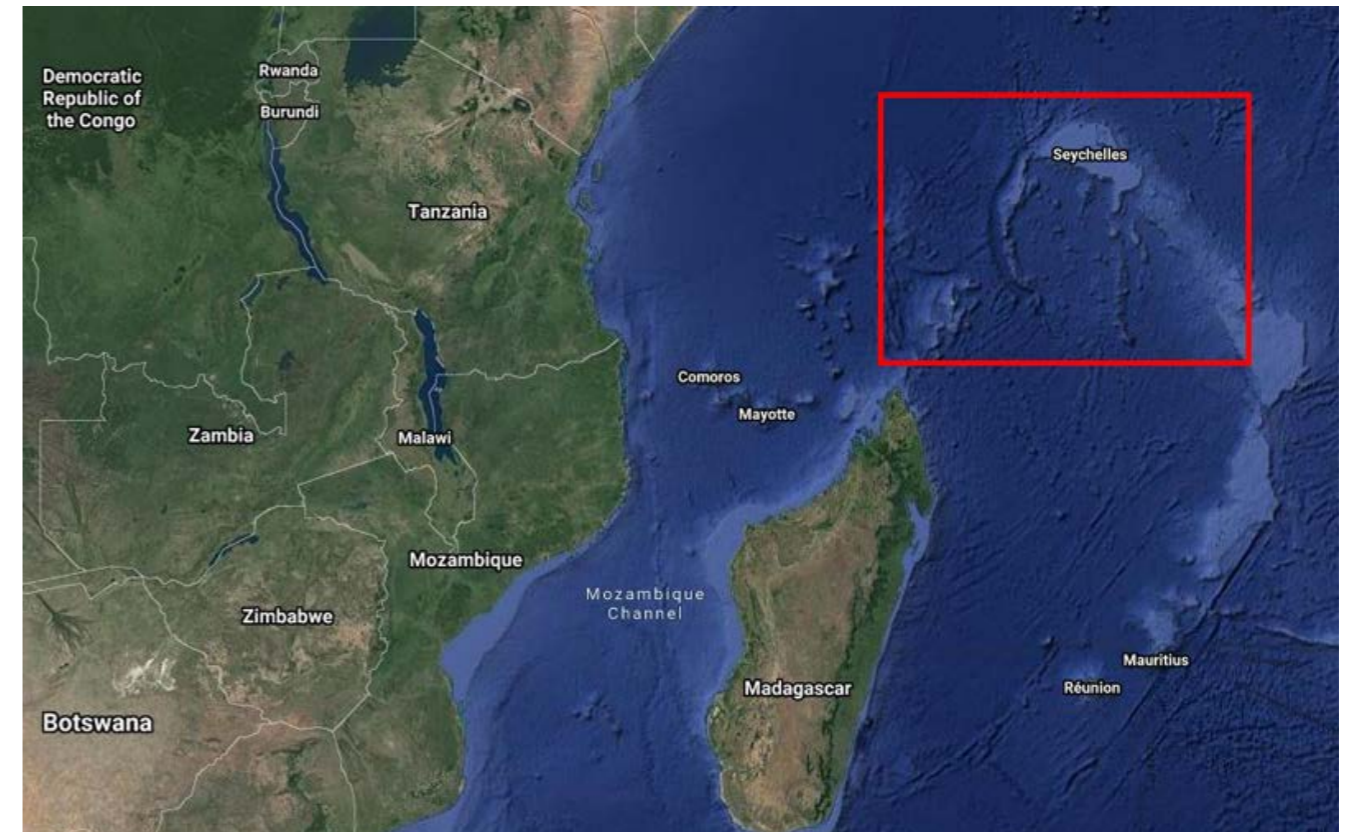
University of Seychelles

Mrs. Penda Choppy



Photo credit: Cindy Georgette Moka

## Geographical location



Map of Seychelles showing its geographical location in East Africa

Photo credit: Google Maps

## Background to the case study

The creole garden is essentially part of the typical creole lifestyle that emerged from New World societies of plantation slavery (Trouillot, 2006). It consists of foodstuffs and condiments, as well as medicinal plants that creole families subsisted on during the early creolization period, and still survives as traditional creole culture in many creole communities, especially rural communities. In Seychelles, the traditional creole lifestyle is closely associated with the kitchen garden that usually surrounds a Seychellois homestead. This garden represents not only an additional source of food, and the condiments that are needed to give the Seychellois cuisine its creole character, but also protection in the form of medicinal plants, and plants associated with cultural beliefs about protection from evil elements. The creole lifestyle, through the creole garden, is celebrated through events like the annual Creole Festival. However, with modernity and the advent of supermarkets and flats and housing estates replacing the traditional creole community, the concept of the creole garden has lost ground and is not being transmitted to the younger generation.

During the COVID-19 lock-down period in Seychelles, our dependency on imported goods became glaringly clear as planes were suddenly reduced to carrying essential cargo, and certain fresh vegetables that were once flown in every day became scarce. People started planting in pots if they lived in flats, and those who had land began planting typical creole foodstuffs such as plantains, dessert bananas, yam, sweet potatoes, tomatoes and herbs. Many recipes and culinary achievements were shared over the social media. Most importantly, people shared recipes from the creole garden and kitchen pharmacy for dealing with the COVID-19 symptoms and boosting the immune system. In a way, people began

searching for their creole identity as the COVID-19 pandemic had made them realize that through their creole gardens, they could improve their food security and reduce the country's carbon footprint. With fewer Seychellois families maintaining a creole garden, many of the plants associated with it and which contribute to biodiversity (in terms of useful plants), are slowly disappearing. There is therefore a need to properly document the creole garden and way of life associated with it in order to promote better knowledge of the creole identity and its links with biodiversity, food security, pharmacology and climate-change mitigation.

## Statement of the problem

The creole garden and associated kitchen pharmacy is closely linked to the traditional creole lifestyle in Seychelles, as in other creole communities. This traditional lifestyle defines the cultural identity of the Seychellois people through their everyday practices and beliefs, inherited from previous ancestral communities from the three continents that populated the islands, or developed and adapted in the local environment over time. This includes animals that provide food, and plants with both medicinal and culinary uses.

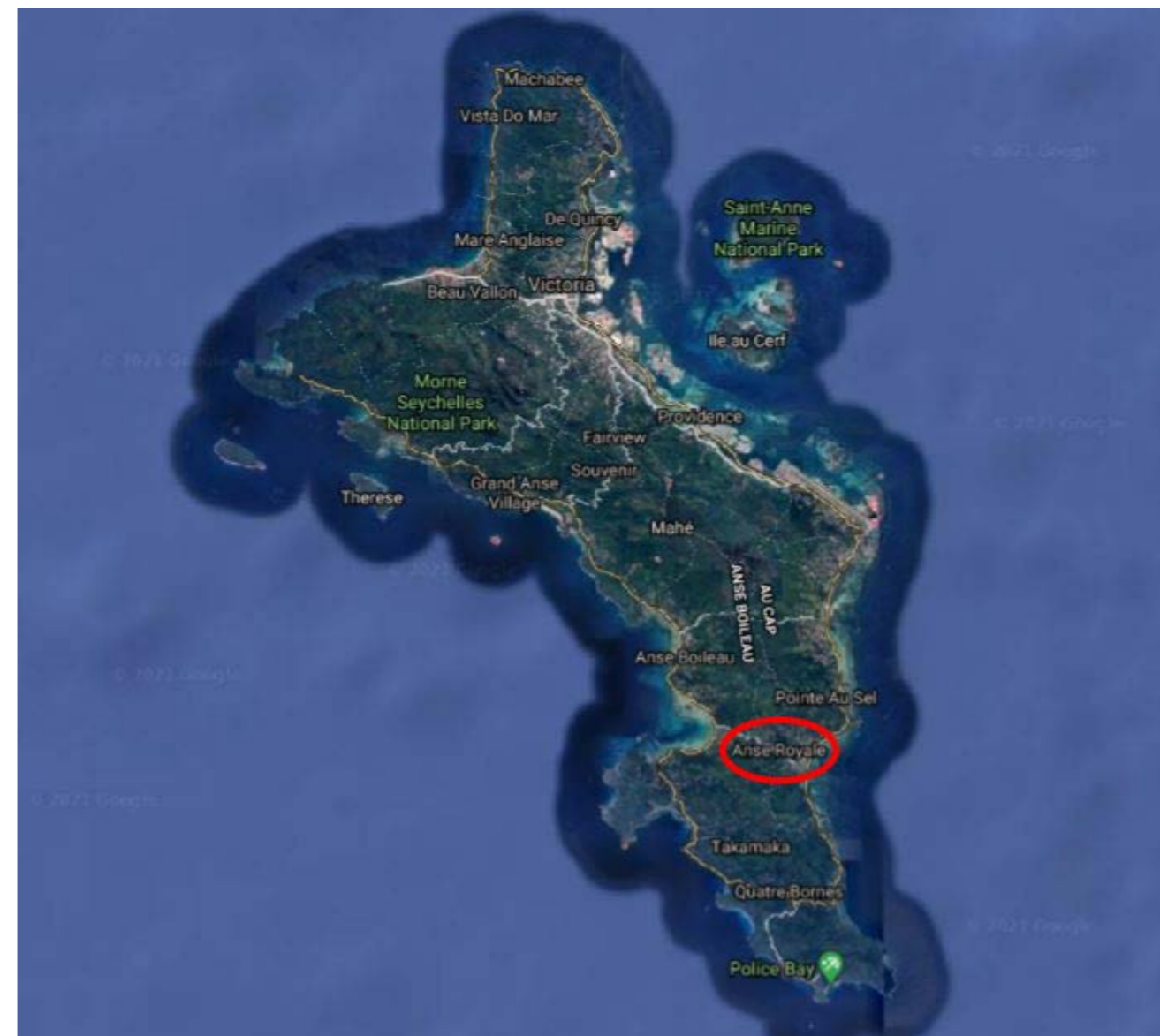
The creole garden also contributes to Seychelles' plant biodiversity as most of the islands' indigenous plants are not suitable for consumption, thus cannot support a human community (SNSPC, 2005-2010). Elderly people always talk about how they never had to buy medicine from the pharmacy or have too many visits to the doctor because their creole gardens kept them healthy. Better use of the creole garden in this manner in today's society could thus reduce our carbon footprint through increased self-sufficiency and limit our impact on the pharmaceutical and food industries. This would also have an impact on climate-change adaptability and mitigation.

Yet, the creole garden in Seychelles does not exist as a known social concept except in the aesthetic sense of the word. Consequently, it has not been associated with tradition and lifestyle in an academic way, nor has it been documented nor its transmission considered an important agenda. Thus, there is a need to document the creole garden and lifestyle and educate the Seychellois population on the links it has to culture and identity, as well as biodiversity conservation and climate-change adaptation.

## Objectives of the case study

- To test the level of awareness of the creole garden and kitchen pharmacy amongst the youth in Seychelles.
- To assess whether the concept of the creole garden and lifestyle is being transmitted from one generation to another.
- To document the various aspects of the creole garden and lifestyle in the context of cultural meaning and practices.
- To raise awareness of the links between the creole garden and kitchen pharmacy, and biodiversity conservation.
- To propose means of promoting the creole garden concept for conservation and educational purposes.
- To propose a means of adapting the creole garden lifestyle to modern Seychellois life and in changing physical and cultural landscapes.

## Case study focus



The location on Anse Roayle on the map of Mahé  
Photo credit: Google Maps

Anse Royale is an administrative district in Seychelles located in the South of the main island of Mahé. Its name is French for Royal Bay as it represents a vast coastline which stretches the length of the narrow bay. The district borders several other districts and has around 17 sub-districts.

Anse Royale is considered the second town on Mahé because of its many services and facilities. It is historically significant being the original area where a spice garden was attempted by the founding colonial settlers in 1779.

The district is well-known for its popular garden 'Le Jardin Du Roi' spice garden, or the Kings Garden, where a variety of spices are grown, such as vanilla, lemongrass, cinnamon, nutmeg as well as other introduced spices.

## Literature review

### The creole garden, kitchen pharmacy and indigenous knowledge

The creole garden and lifestyle is an example of a sustainable way of life that was born out of necessity in island plantations during the slavery period, and evolved to become the central pillar of creole culture, even after the end of slavery and beyond, into modern times. This is supported by Michel Trouillot's theory of the plantation as the cultural matrix of creolization (2006).

Referring to the Caribbean islands, Trouillot argues that even if culture is defined purely in the sense of artistic and intellectual production (high culture), 'the real achievement is, of course, that of the anonymous men and women who have woven, along the centuries, in spite of slavery and other forms of domination, the cultural patterns upon which rest the highly individualized performances of the intellectuals' (2006, p.10). It can be further argued, that these anonymous men and women are responsible for domesticating and enhancing their physical environment, and for learning how to exploit and conserve the richness of the original plant life around them, through methods that have been passed down through generations in intangible ways.

Trouillot emphasizes the fact that creole cultures emerged against all odds, and were thus evolved on the margins of society – and yet, they came to 'dominate cultural processes' in their respective societies (pp.10-15). How did that happen?

First, the plantation, during the slavery period, was an agricultural enterprise that used a forced labour that was kept 'at the bottom of the socio-political ladder' (p.15). This labour force produced commodities for markets 'outside of the economy within which the plantation itself operated' (p.16). This meant that the said labour force could not rely on the produce they spent most of their working day on, as a means of revenue for their subsistence. Again, they had to resort to eking out a subsistence by manoeuvring their particular situations based on their inherited knowledge and their adaptation to their new circumstances and environments (p.16). For example, in contradiction to the established slave system, many slave masters allowed their slaves the time and space to grow their own food, simply because it relieved them of the need to feed them (p.17). The terrain they were given was 'steep and broken terrain, less fertile lands not used for the production of plantation staples' (p.17). This is the cradle of the creole garden, the 'space where one learned to cherish root crops, plantains, bananas; space to raise and roast a pig, to run after a goat, or to barbecue a chicken; space to bury the loved ones who passed away, to worship the ancestors and to invent the new gods when the old ones were forgotten' (p.17).

This space created the creole lifestyle as well, for it engendered the need and the liberty to talk to a neighbour over the fence, and perhaps share produce – the surrounding environment became an extended provision ground, for example, fishing in the adjacent rivers... (p.17). It is in this space that the slaves' children learned to climb trees, and develop modes of thought and codes of behaviour that were to survive plantation slavery itself (p.18).

### Transmission of traditional food and medicinal knowledge through the creole garden

Food, in the creole culture, as in any culture, has a symbolic and cultural significance. In some cultures, specific foods are associated with a specific group's cultural identity (Douglas, 2002).

Knowledge about food is developed in an informal setting at home, and requires cultural teaching or transmission (Maynard and Greenfield, 2006). The preservation of traditional food knowledge is linked to human empowerment and nutrition, and also to broader human ecological concerns such as biodiversity.

Similarly, indigenous knowledge about medicinal plants has the same cultural and symbolic significance. Many of the plants found in the creole garden, which extends to the surrounding environment around the home, have important medicinal properties which are also linked to traditional beliefs and practices in Seychelles (Matatiken et al., 2011). According to traditional herbalists in Seychelles, plants from the environment of Seychellois homesteads are used to treat ailments such as hypertension, diabetes, gynecological-related issues like the menopause, skin problems like eczema, especially in children, and respiratory disorders, including asthma. Increasingly, stress-related problems are also being treated with traditional medicinal herbs (Matatiken et al., 2011). In order to make effective use of this resource, it is important to have a thorough knowledge of the local species, their location, use and anecdotal evidence of their efficacy. This is part of the legacy that elders should leave for posterity, through inter-generational transmission (Matatiken et al., 2011).

There has been increasing interest, in the past decade, in promoting bio-cultural diversity (Maffi, 2001). Biodiversity has been described as the cradle of raw materials for food and the 'key to ecological integrity' (Nazarea, 1998, pp.2-3). Folke et al. (1996) also discuss the dependence of economic and human activity on biodiversity, which acts as insurance for ecosystems to function with resilience to change. Biodiversity conservation should thus extend beyond protected parks to policies and reforms that defend sustainable human activity, such as a social group's cuisine and traditional medicine, and associated plant and animal life.

### The creole garden in the Seychellois landscape, and conservation efforts

The Seychelles National Strategy for Plant Conservation (2005-2010) gives a very good idea of how the Seychellois have traditionally exploited their immediate environment for sustenance; not only in terms of food, but also for enhancing health and for home embellishment. Plants around the home and in the environment have been used for food, timber, roofing material, medicine, tools, craftwork and decorations (p.8).

This is an excellent description of Herskovits' 'acculturation' theory in which he discusses how black American slaves survived in the New World by making use of knowledge remembered or passed on from the Old World, and adapting it to their new environment, whilst also adapting the things they found in their new environment to their needs (1941). Creole culture and its survival depends on adaptation, and on assimilation. For example, as the national strategy for plant conservation makes clear, there are only a few native plants in Seychelles that are edible, 'so almost all our food plants have had to be introduced'. This includes the slaves' staple food, the breadfruit, which is protected by the Breadfruit and Other Trees (Protection) Act (1975, 1976, and 1998) in the laws of Seychelles. Such introduced plants are described as being 'vital for our survival' and include not only economically viable plants such as coconut, cinnamon and vanilla, but also medicinal plants such as the 'rozanmer' (Madagascar Periwinkle), and what today many people might perceive as 'weeds', such as the 'gerivit' (Vernonia Cinerea) (SNSPC, 2005-2010, p.8).

The creole garden is endangered in Seychelles not only because of modernity, but also because of its links to a marginalized past. Though the breadfruit has many nutritional and medicinal benefits (which had kept our ancestors healthy), because it was introduced from the Pacific to feed the slaves in the colonies, it has a lingering stigma attached to it (Badrie and Broomes, 2010; DeLoughrey, 2007). In Seychelles, it is often associated with a time of misery when it was all the poor people had to eat (Boswell, 2017). As such, it may not be as valued by ordinary people, as it should be.

The sweet potato is another example whereby the older varieties that were introduced during the early period are being neglected in favour of new, improved varieties that provide higher yields or are resistant to pests or disease. However, as the National Strategy points out, these varieties should be maintained for the very reason that they bring variety, but most importantly, in the context of climate change, they may prove to have other 'characteristics that help them to survive in the changed conditions' (2005-2010, p.8).

Finally, the traditional creole garden is often neglected in favour of exotic plants that tend to give a more manicured aspect to Seychellois modern landscaping (the creole garden is more of a jumble targeting utility before aesthetics). Since creole culture is created through assimilation and adaptation (Hall, 2010), it is important to accept new assimilations and not remain stuck with rigid notions of what a creole garden should constitute. These assimilations have already begun, for example through the introduction of plants like rosemary, oregano and aloe vera from other countries in the Indian Ocean region, and which have now become part of our cuisine and medicinal repertoire (Matatiken and Dogley, 2005).

## Methodology

### Sampling, tools and sources of data

The target groups for this research were: (i) Youths aged between 15 and 25 years, (ii) elders of above 65 years.

For the first part of the research, the aim was to find out how much the younger generation knew about the creole garden concept and whether they were involved in any of its practices. To this end, a set of mostly open-ended questionnaires was designed and distributed via SurveyMonkey. The desired number of respondents was between 200 and 500. However, only 56 respondents completed the survey in the given time-frame. The questionnaires were sent to the University of Seychelles, professional centres and the Ministry of Education for distribution to secondary schools.

For the second part of the research, purposive sampling was used to select a restricted number of informants who are known to be practitioners of the creole garden and lifestyle in a specific community, which is the community of Anse Royale. All of these informants are members of the Heritage Foundation of Seychelles (SHF) 'Living Heritage' project, and as such are qualified to be informants in this domain. They have expertise in creole cuisine, the use of medicinal plants, and they all maintain a creole garden. The main aim was to document the different creole gardens observed and the informants' knowledge about their cultural meanings and uses. The tools and methods used were interviews and observation.

Though the desired sample in this target group was 14, only 8 were actually achieved due to COVID-19 restrictions which were suddenly reinforced during the fieldwork period.

### Data management and analysis strategies

The research required a mixed-method approach. The questionnaires, which had already undergone a partial quantitative analysis via SurveyMonkey, was further analyzed qualitatively for context, and categorized by themes, then put through another quantitative assessment for frequency distributions. The overall results were then again analyzed qualitatively through textual interpretation.

In the case of the fieldtrips to the homes of the informants, their interviews were recorded and notes were taken of their home environment and the interactions that took place during the visits. The interviews were then transcribed, translated and the relevant data extracted as per the research objectives and stated research problem.

### Additional sources of data

Information gathered from this research has been supplemented by existing literature which has been published about Seychelles biodiversity and plant life.

## Ethics considerations and human rights issues

### Preparation and distribution of questionnaires

- The anonymity of all respondents was ensured.
- For secondary-school students, parental consent was sought for their children's participation.
- Organizational approval was also sought for the questionnaires to be distributed amongst members.

### Fieldwork

- Due to COVID-19 restrictions in place when the fieldwork was conducted, the permission of the Public Health Authority was sought to access the elders' compounds. Strict guidelines were observed regarding social distancing, face-masks and sanitization.
- Teamwork was limited to two or three persons at a time.
- Interviews and consent forms were prepared in Kreol, which is the mother tongue of all the informants. The objectives of the project were explained to the informants beforehand.
- Fieldworkers ensured that they observed all the social rituals of behaviour when entering the compound of a creole elder, and that this was maintained throughout the time spent there. This, of course, excluded traditional greetings such as kissing and shaking hands which are currently forbidden due to COVID-19 restrictions.
- The project was conducted with the mutual participation of the elders who consider themselves as custodians of the creole garden and lifestyle. They also expressed a sense of pride in being selected for the project, and in their creole identity.

## Strengths and limitations of the case study

### Strengths

The main strength of this study is that Seychelles has invested a lot in environmental education, so the younger generation tend to be very aware of climate change and environmental issues. As such,

it was easy to gain the interest of those who participated and to reopen discussions amongst them about environmental issues from another angle.

This study has also served as a means to revive a very important aspect of our bio-cultural heritage that is easily in danger of disappearing. The results of the study can serve as a solid foundation for opening a campaign to raise awareness of the creole garden and lifestyle, and its significance to Seychellois identity and culture. Linking this with biodiversity conservation and climate-change mitigation further strengthens this ICH element as it can be backed by already-existing environmental structures.

### Limitations

Due to COVID-19 restrictions, access to the informants was very difficult. Distribution of the questionnaires was impeded by bureaucratic issues and this affected the number of participants who had timely access to them. However, the most significant limitation was the time factor. The time allocation to complete the study was very short and the researchers had to do it alongside their regular jobs.

## Findings

### Questionnaire analysis

#### Age group

84% of respondents were aged between 15-24 and 16% were aged 25 and above.

#### Representation of districts

- Out of 26 districts, 22 were represented in the survey.
- The highest concentration of respondents was evenly distributed between central and South Mahé, and the lowest was in North Mahé.

#### Understanding of the creole garden:

54 respondents out of 56 responded.

- Approximately 11.2% of the total respondents had a good idea of what constitutes a creole garden
- Approximately 9.5% of the total respondents had almost no idea at all of what constitutes a creole garden
- Approximately 21% of the respondents had only a vague idea as to what constitutes a creole garden.

#### Knowledge of plants most associated with the creole garden

Respondents were asked to name 2 plants most commonly associated with the creole garden.

- Based on the fieldwork results, most of the key plants identified as traditional creole garden plants were selected by the questionnaire respondents.

- In order of popularity, these plants include:
  - 'Roazanmer' (Madagascar Periwinkle);
  - 'Mayok' (Cassava);
  - 'Bred Mouroum' (Moringa), 'Sitronnel' (Lemongrass), 'Zepis' (usually referring to parsley and thyme, but may include local ginger and spring onion) all scoring equally;
  - 'Fryapen' (Breadfruit) and 'Papay' (Papaya) both scoring equally.

Significantly, the condiment considered as most essential by the informants in the fieldwork, the 'bilimbi', was mentioned only once.

However, some plants mentioned were (i) endemic plants, such as the coco de mer; (ii) indigenous plants such as the 'Bwasousouri' (Ochrosia Parviflora) and 'Bwatorti' (Noni), which are also known medicinal plants but are not commonly found in individual gardens; (iii) exotic plants used for modern landscaping such as palm (the plant mentioned was 'pye palm', meaning palm tree, which is the common name for imported palms such as the Christmas palm. Endemic palms, such as the 'Latanier', would normally have been mentioned by their specific names).

#### Benefits of the creole garden

Respondents were asked what, in their opinion, were the benefits of the creole garden. Some respondents gave more than one answer. Their answers have been categorized in the following fields in terms of number of times cited.

Benefits	Medicinal properties	Aesthetic	Biodiversity
Mentions	8	6	2

Benefits	Healthy, organic living	Saving on expenses	Culture and identity
Mentions	17	24	6

#### Access to a creole garden:

Respondents were asked if they had a creole garden and what were its contents.

- 39 out of 56 responded to this question, representing about 70% of the total participants of the survey.
- 2 participants said they did not have a creole garden. On the assumption that the 17 who declined to answer did not have a creole garden either, 8.4% of the total participants of the survey either do not have access to a creole garden or have no idea what it is.
- Most of the plants cited by the participants who said they had a creole garden were indeed traditional creole garden plants.

### Loss of the creole garden:

The respondents were asked if they thought the creole garden was disappearing and why.

- 73% said ‘yes’ and 27% said ‘no’.
- The following were cited most often as the reasons for the loss of the creole garden: (i) loss of knowledge and interest (especially amongst youths); (ii) no appropriate land; (iii) modernization (better access to imported goods and medical facilities); (iv) more interest in exotic plants.

### Efforts to conserve the creole garden

- 41% of the respondents believe that not much effort is being put into preserving the creole garden.
- 34% of the respondents cited various efforts being made by the government, schools and wildlife clubs to preserve some aspects of the creole garden but, in general, more in the context of general environment conservation.

### Understanding of biodiversity

- 80% of the respondents answered this question; 20% skipped it.
- 36% of the respondents have the right idea about the meaning of biodiversity.
- 11% are not sure what it means.
- 7% have no idea whatsoever.
- 14% have a vague idea.

### Contribution of the creole garden to plant biodiversity in Seychelles

- 64% of the respondents answered; 36% skipped the question.
- 30% of the respondents believe that the creole garden contributes to the variety of useful plants in Seychelles.
- 70% of the respondents either did not respond or gave answers that were not relevant.

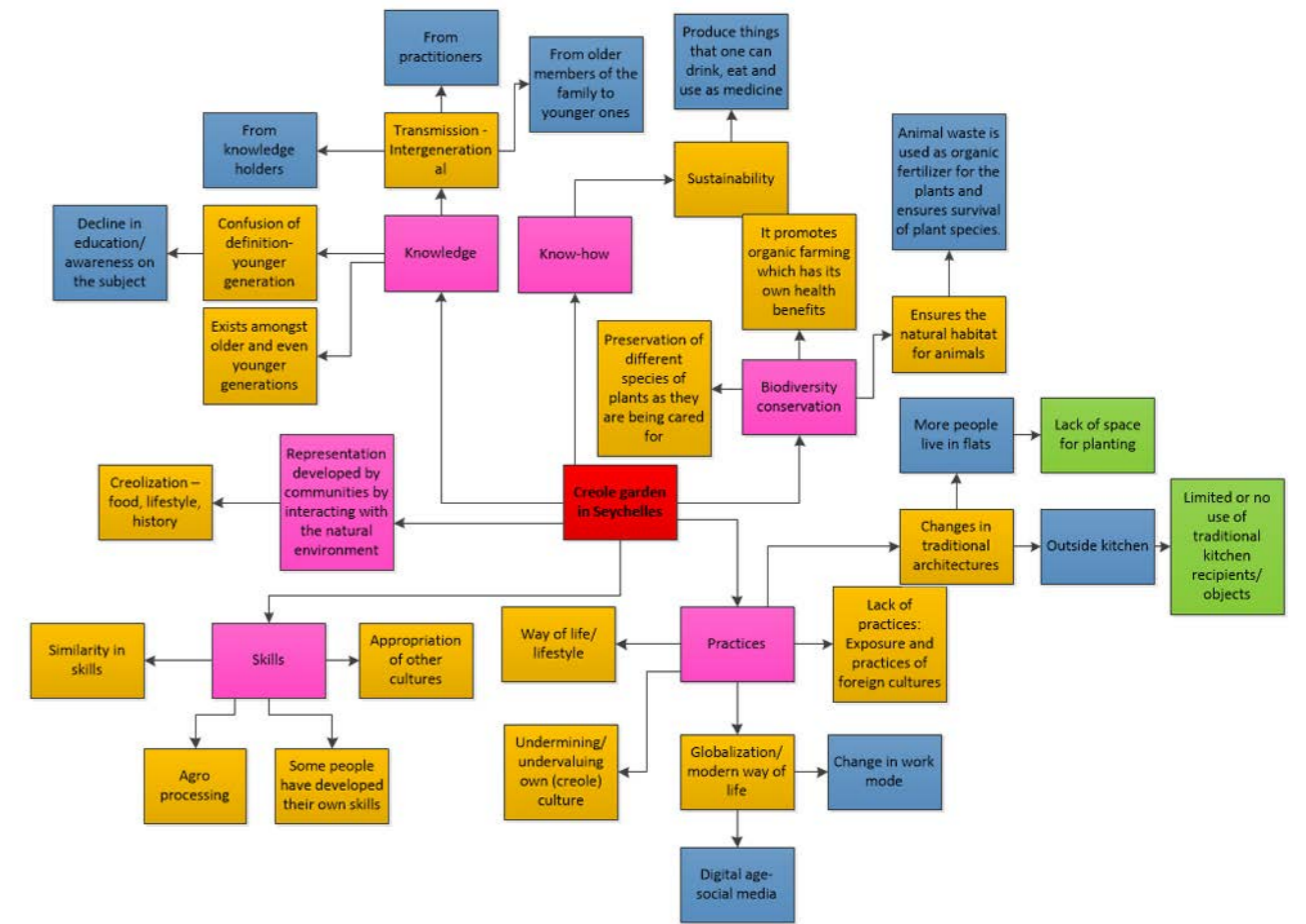
### Creole garden plants in respondents’ immediate environment and usage

Respondents were given a list of 20 creole garden plants. About 98% affirmed that they used these plants. The table below shows the most abundant and rarest plants in the respondents’ environment.

Most abundant (Above 70%)	Rarest (Below 30%)
‘Piman’ (Chilli pepper) - 84%	‘Yapannan’ - 7%
‘Roazanmer’ (Madagascar Periwinkle) - 80%	‘Zenzanm lokal’ (local ginger) - 7%
‘Papaya’ - 82%	‘Safran ver’ (tumeric) - 13%
‘Bilimbi’ - 78%	‘Koket’ - 27%

### Transmission of creole garden plants usage

85% of the respondents had learned about creole garden plant use from the elders in their families or neighbourhood. The remaining percentage did not give relevant answers.



Mind map relating the findings to elements of ICH

## Fieldwork data analysis

### Cultural significance

- The creole garden is for sustenance: to supplement food; for condiments particular to creole cuisine; drinks, e.g. fruit juice and toddy; medicine; protection, e.g. ‘bwamalgas’ reverses the effect of ingested substances.
- Most creole plants have a wide diversity of uses. For example, coconut is used as a condiment, an ingredient for dessert, food for animals, medicinal purposes, for the extraction of other products such as oli and copra, household products such as brooms, building materials, drinks such as coconut water and toddy.
- The creole garden must contain a specific category of plants to be considered as such. These are: starchy foods (‘gro manze’); condiments; vegetables; fruits; herbs and medicinal plants; animals; flowers.
- The creole garden is a source of pride to the Seychellois homeowner in terms of aesthetics, due to its colourful flowers.
- The creole garden represents identity/créolité.

### Transmission of knowledge

- Natural transmission of knowledge, from generation to generation, is no longer happening due to increased access to manufactured food and medicine.

- The younger generation is increasingly preoccupied with modern gadgets and not interested in the creole garden.
- Some local traditional concepts associated with the creole garden and lifestyle are disappearing due to lack of use, and with it, the associated vocabulary, for example: 'benswe', 'kwirl', 'yapannan'.
- As the older generation disappears, fewer people are growing plants associated with the creole garden.

#### **Reducing carbon footprint in the context of food and pharmaceutical industries**

- Most informants stated that their creole garden saved them money as it increases their self-sufficiency.
- Some elders believe that using medicinal plants from the garden is sometimes more effective than going to the doctor. For example, one informant treated a man, whom she had diagnosed as suffering from wind, with 'yapannan', when different doctors had failed to diagnose him.
- Creole garden products are healthier and render their consumers healthier.

#### **Biodiversity conservation**

- The creole garden is an eco-system: people depend on the plants for consumption; some of the plants are used to feed animals; the animal waste is used to feed the plants; people eat the animals.
- Some essential medicinal plants, such as 'yapannan' have almost disappeared.
- Some medicinal plants are considered as 'weeds' and consequently destroyed systematically, for example through mechanical grass cutting.
- Modern landscaping involves more exotic plants, such as orchids, and these are often valued more than the useful plants of the creole garden.

## **Discussion**

The creole garden represents a whole lifestyle that is still relevant and important to the older generation; in the past it represented sustenance and the wellbeing of the community. This is why it is still considered important by the older generation.

The results of the study of the younger generation are generally confirmed by the results from the older generation. However, though the youths have displayed an awareness of medicinal plants and creole garden food culture, their understanding of the whole concept is limited, as is their practice of the lifestyle.

The creole garden and lifestyle is linked to several elements of ICH as described in the UNESCO 2003 convention for the protection of ICH (refer to the pink boxes in the above mind map). These elements are specified in the domain entitled 'Knowledge and practices concerning nature and the universe.'

Some specific examples are as follows:

- In the context of communities' interaction with their natural environment, we realized that because of the conditions of slavery, colonization and isolation during the early settlement period, the creole garden emerged as a survival phenomenon and is central to the creolization process in Seychelles.
- However, in the context of cultural practices in present times, the creole lifestyle has been

- affected by globalization, modernization, changes in architectural practices and work modes, resulting in the erosion of the creole garden and associated kitchen pharmacy.
- In the context of ICH and biodiversity conservation, a revival of the creole garden values and lifestyle would contribute towards a healthier lifestyle and also a renewal of knowledge about the maintenance of the creole garden and its uses, through new modes of transmission – for example, condiments and foodstuff with health attributes, as well as medicinal plants.

## **Conclusion**

The main benefit that has come out of this research is the linking of biodiversity conservation and climate change mitigation to ICH. This has brought out the fact that the traditional food culture and medicinal practices of the Seychellois people is, in itself, an ecosystem that should be preserved and promoted. It is a fact that in Seychelles, there have been national campaigns promoting environmental concerns such as biodiversity conservation, the blue economy, and climate change adaptation. There have been no campaigns, however, to promote the creole lifestyle and identity, apart from showcasing various aspects of it in the annual Creole Festival which is, in fact, currently at a very low ebb. And yet, many Seychellois have reacted to the present pandemic by seeking out traditional medicinal recipes and food production techniques around the home, as it was revealed to us how vulnerable we are as a remote island state that depends mostly on importations. There is a need, therefore, to discuss how indigenous and modern knowledge can be merged to address current challenges (Kidd, 2016). There is also a need to better appreciate the link between biodiversity, climate change and ICH. As discussed by Folke et al., (1996), biodiversity conservation should indeed go beyond the creation of parks, and extend to policies that consider sustainable human activity. This research thus calls for a national campaign about the creole garden and lifestyle and its connections to biodiversity conservation and climate change, beginning with the following recommendations.

## **Recommendations**

#### **Education**

Creation of a 'Living Heritage' garden at the Domaine de Val des Près heritage site, which will be accessible to the public, including young people.

#### **Conservation**

Creation of a nursery at the University of Seychelles and corresponding living creole garden at the Anse Royale Home for the Elderly, for formal teaching and oral transmission.

#### **Promotion**

Publication of a book which documents the creole garden and creole lifestyle. Follow-up activity will include presentations in districts.

#### **Policies**

Lobby for a creole garden category to be included in national home-embellishment programmes, and for this element of our ICH to be included in cultural policies and heritage education.





One of the informants proudly showing her creole garden (Photo credit: Cindy Georgette Moka)

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A creole garden dish made with golden apples and spiced with chilli (Photo credit: Cindy Georgette Moka)



Bwamalgas (*Euphorbia tirucalli*). Used ritually in an infusion to counter evil. In typical creole garden style, medicinal plants mixed with colourful, decorative flowers (Photo credit: Cindy Georgette Moka)



Creole pride in the home environment (Photo credit: Cindy Georgette Moka)



Organically raised fowls part of the creole garden landscape (Photo credit: Cindy Georgette Moka)



Madagascar Periwinkle (Rozanmer) (Photo credit: Cindy Georgette Moka)



Passing on the creole garden to the younger generation (Photo credit: Cindy Georgette Moka)



Sugarcane (historically associated with the plantation)-used for the local fermented drink, baka, and the heart is boiled as a treatment for urinary infections. Also a snack (Photo credit: Cindy Georgette Moka)



Welcoming guests with fruit juice made from creole garden produce (Photo credit: Cindy Georgette Moka)



The creole garden makes use of recycled materials (Photo credit: Cindy Georgette Moka)



Yapannan (*Eupatorium ayapana*)-a disappearing medicinal plant in the creole garden (Photo credit: Cindy Georgette Moka)

# Somalia

## Somali Indigenous Oral Literature and Biodiversity Conservation: The role of poems, proverbs, superstitions and storytelling

Somaliland Youth Development and Voluntary Organization (SOYDAVO)

Dr. Ahmed M. Musa



Photo credit: Hamse Aided, SOYDAVO

## Geographical location

Somaliland, a former British protectorate, is located between latitudes  $8^{\circ}$  and  $11^{\circ}27'$  north and longitudes  $42^{\circ}35'$  and  $49^{\circ}$  east, and borders with Djibouti to the northwest, Ethiopia to the Southwest, and the Gulf of Aden to the north. Although the Somaliland climate is semi-arid to arid, the rainfall pattern is different from region to region in terms of frequency and performance (Mirreh, 2017). In terms of frequency, the eastern and southern areas of the country have a bimodal rainfall pattern with two distinctive rainy seasons and two dry seasons. The rainy seasons are *Gu* (April to June) - the main rainy season when 60% of the rain is received - and *Dery* (October to November) - the lesser rainy season when 40% of the rain is received (World Bank, 2006; Mirreh, 2017). The two dry seasons are *Jilaal* (January to March) and *Xagaa* (July to September) (Godiah et al., 2014). In terms of performance, the eastern and southern regions receive 200mm per annum, the western regions receive up to 450mm and the Golis mountain range receives more than 500mm (Gilliland, 1952; Mirreh, 2017). The difference in rainfall performance influences vegetation. The agricultural land is only 10% in the western regions while the rest, excluding settlements, is considered rangeland, producing forage (Mirreh, 2017). Historically, extensive livestock production has always been an important economic activity in Somaliland and rich livestock production needs a healthy biodiversity; the Somali territories were not short of wildlife. For example, in 1963, Sir Geoffrey Archer, mentioned big game and a wonderful wealth of bird life and described British Somaliland as 'Mecca, the magnet of attraction, for the sportsman-naturalist from Britain and the Continent' (cited in Mohamed, 2004).

## Background to the case study

There is a debate as to whether 'historical climate' or 'human activities' have contributed to environmental degradation (Mohamed, 2004). In the absence of, or limited, formal institutions that had the mandate to conserve the environment, Somalis used oral literature (sugaan), including poems (gabayo), proverbs (maahmaaho), superstitions (sheeko baraley) and storytelling (sheeko xariiro) to constrain human activities that could adversely impact the environment. Somalis learned, memorized, composed, and familiarized themselves with the intangible heritage at infancy (Rirash, 1992) and lived with these institutions as adults. Somalis appreciated the importance of the environment and biodiversity as they interacted with biodiversity in daily life. They grazed their livestock with different indigenous grasses and plants, such as the valued *Acacia Bussle* (galool), or relied on other trees such as *Ziziphus Mauritiana* (Gob) for fruits, medication, and beautification. They also made the items they used daily, including all items usually possessed by a rural household, from venerated trees. For example, roofing (caws), milk containers (haan), walking sticks (budh/barkoorad), spoons (fandhaal), ladle (dhure), camel's bell (koo) and halters (hogaan) were all made of different tree and plant species. There are plenty of songs that describe beautiful women who bore a resemblance to animals (such as horses and peacocks) or venerated trees. This indicated how Somalis valued their habitat. They also lived in harmony with different animals. However, there is now a noticeable decline in Somali's intangible heritage due to human activity and ecological changes brought by climate change, globalization, and urbanization. There is also a small effort to continue to revive intangible heritage, such as the pack camels, by harnessing new technology such as social media, as highlighted by a recent blog post (Schwere and Musa, 2020).

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## Statement of the problem

Oral literature (poems, sayings, superstitions, storytelling) was the jewel in the crown for the rich Somali intangible cultural heritage. It provided indigenous knowledge that constrained human behaviour to conserve biodiversity.

Oral literature (poems, sayings, superstitions, storytelling) was the jewel in the crown for the rich Somali intangible cultural heritage. It provided indigenous knowledge that constrained human behaviour to conserve biodiversity. Johnson (1998) defined indigenous knowledge as that of specific communities and local environments. Somalis have eloquently tapped their 'rich oral literature' to express social concepts such as peace, conflict and disaster, animal protection and disaster risk reduction. Today, both the rich oral literature and biodiversity are under threat due to many local and global socio-economic changes. The role of African indigenous knowledge in environmental conservation and disaster risk reduction is acknowledged by the global scientific community and was endorsed at the World Conference on Science in July 1999, recommending that traditional knowledge is integrated into the field of environment and development (UNEP 2008). It is against this backdrop that this pilot study tried to document Somali oral literature used for environmental and biodiversity conservation and risk reduction, the changes that affect the oral literature, and how changing oral literature on biodiversity conservation can be mitigated.

## Objectives of the case study

### Overall research question

The overall research question is to document Somali oral literature (proverbs, poems, superstitions, stories) that contributed to the conservation of environmental biodiversity and disaster risk reduction and the changes in this endogenous knowledge.

### Specific research questions

- To document how indigenous Somali oral literature was used to conserve biodiversity and disaster risk reduction
- To analyse the changes in this indigenous knowledge that could contribute to the lack of environmental conservation
- To understand what can be done to revive and conserve Somali indigenous knowledge for biodiversity conservation.

## Methods

### Population and study sample

The study aimed to capture the indigenous oral literature from different generations, genders, and pastoral areas. For the generations, the study targeted grandparents (over 60), parents (40-60) and the current generation (below 40). For the gender, both males and females were interviewed. For the geographic location, those interviewed represented different pastoral communities with different relationships with biodiversity than the agro-pastoral communities who mainly lived on private lands. Due to the rural-urban migration, many of those knowledgeable in Somali literature have moved to the major urban areas; therefore, most of the interviews were conducted in Hargeisa and Burao cities. However, some field visits and

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further interviews were also conducted in selected rural areas in the east and south of Burao city.

### Sample size and selection of sample

The study needed to target research participants with specialized knowledge of indigenous Somali intangible cultural heritage (sayings, poems, superstitions). This necessitated the implementation of purposive and snowballing sampling. The Somalil and Youth Development and Voluntary Organization (SOYDAVO) utilized its relationship with the community to identify and recruit research participants.

### Sources of data

The primary sources of the data included individual and group interviews. The study also considered secondary sources of data, including YouTube audios and books on Somali poems. The interview sessions lasted between 40 to 70 minutes.

### Data analysis strategies

After obtaining consent from the interviewees, each session was recorded. This was followed by transcription and qualitative data analysis conducted by experienced researchers.

## Ethics considerations and human-rights issues

The data collection and documentation was guided by the Operational Directives of the 2003 UNESCO Intangible Cultural Heritage Convention for carrying out community-based inventories, as well as the guidelines of the Convention on Biological Diversity, ensuring the free, prior, and informed consent (FPIC) of the communities concerned and in line with the Ethical Principles for Safeguarding Intangible Cultural Heritage. Informants' consent was sought before the interviews started. The research team explained the nature of the research and that UNSECO would use their data, to which they all consented.

## Strengths and limitations of the case study

The strength of this study is that it could be the first of its kind undertaken to systematically (though pilot and exploratory) document the Somali indigenous oral literature for environmental conservation and disaster risk reduction. This study could support future efforts on this subject. The weakness of this study is that it was pilot and despite the fact that the research team tried to gather rich data in a short period, time and budget constraints limited the indigenous knowledge they could capture and the geographic areas they could visit. Another limitation is that research of this nature requires a multidisciplinary team of researchers, including anthropologists, animal and plant specialists, ecologists and environmentalists; the research team available had to cover all these roles.

## Findings

### Understanding environment and biodiversity from the Somali perspective

The environment has different meanings and interpretations to different people. The broad understanding is that the environment is our surroundings, and humans have different relationships with what surrounds them, while what surrounds humans also has different inter-relationships; hence the scientific definition of environment contains both the biotic (living) and abiotic (non-living)

that surrounds us (SOAS, n.d). In the Somali context, findings show that level of education and age influences the understanding of the concept of environment. The grandparent generation understood the environment (*deegaan* in Somali) as the inhabited physical spaces/territories. It is common to hear *degaanka beesha* (literally meaning the environment of the community or community settlement). The parent and current generation have a broader understanding of the concept of the environment. To them, the environment is where people, animals, insects, reptiles, and trees co-exist.<sup>1</sup> To the parent and current generation, who are more educated, the environment is more than an inhabited physical space but a space where biodiversity exists. The environment is a 'space where life is possible for different living species and where the loss of some of these species can disrupt life.'<sup>2</sup> This conceptualization of the environment introduces the concept of biodiversity, '...the living fabric of our planet. It underpins human wellbeing in the present and the future, and its rapid decline threatens nature and people alike'(UNSECO, 2018).

### Somali intangible cultural heritage and biodiversity conservation

Somali intangible cultural heritage (ICH), including poems, proverbs, superstitions, and storytelling, regulated the relationship of humans with their environment and provided informal traditional laws (*xeer dhaqameed*) that, for example, reduced human-animal conflict and promoted the concept that humans lived in harmony with the environment while warning of the consequences of harming the biodiversity. In the following sections, we discuss how this ICH was used for environmental conservation.

#### Poems (*gabayo*) for environmental conservation

Environmental issues were not a major concern in Somalia before the 1988 war. Therefore poems on environmental conservation are not as numerous as poems on conflicts and contestations which were major concerns in the Somali peninsula. The Somali biodiversity was seasonal rain-dependent but remained healthy and regenerated itself quickly during the *Gu* rainy season. There are plenty of poems that praise, by way of analogy, good looking women, horses, and camels comparing their subject of praise with the beautiful nature during the rainy season. However, superstition is more commonly used in ICH to conserve the environment, especially trees and animals.

**Trees:** The Somali nomadic community had a strong relationship with trees which provided different ecological services, including shadow, fruits<sup>3</sup>, medicine, and rural household possessions which were made from the trees and grass. Other social values of the trees included being used as 'sitting rooms' where the pastoral households used to rest or receive their visitors during the day, 'wards' where the sick people were laid and treated, and as a school for the children.<sup>4</sup> The trees were also used as 'conference halls' where community gatherings were hosted to solve conflicts and ask for a girl's hand in marriage. In previous times, 100% of pastoral household possessions were made from trees and grass. Considering all the social values of trees, the society prohibited *gurmo go'an*, cutting a tree from a point where it will not regenerate itself. *Gurmo go'an* was considered a curse.

The grandparent generation stated that biodiversity and environmental awareness was

1 Mohamed Bedel, Hargeisa, March 8, Hargeisa and Keyse April 24.

2 Keyse April 24.

3 Once, everyone would go back home and eat rangeland fruits and drink milk from animals for a meal. Not many families cooked meals.

4 The word *dugsi* which refers to the basic Islamic education for children is from 'fencing the tree for students'.

limited in their generation; however, they still protected the environment.<sup>5</sup> A good case in point is a conference on environmental conservation organized by two respected traditional elders<sup>6</sup> in Hargeisa in 1870 where laws were passed that prohibited cutting down a tree and killing wildlife [*ugaadha*].<sup>7</sup> Years later, someone who saw people violating these laws expressed his concern in a poem:

- *Goaankii suldaank iyo shirkii beri la gawriiray*
- *Iyo guriga sheikh Madar wixii laysku gacan qaaday*
- *Dhirta yaan la goyn iyo ugaadh waa la gees maray*

- The decision of the sultan and the conference that was once organized
- And what was agreed in the house of sheikh Madar
- To not cut down trees and kill wildlife was violated

The poem and the conference were in the 19<sup>th</sup> century when the Somali environment was healthy, and long before the biodiversity agenda become global, but both are indicative of the indigenous biodiversity conservation and awareness.

Some tree species were venerated and protected more than others. Two trees that were valued and protected because of their social, medicinal, and economic value were the Acacia Bussle (*galool*) and Ziziphus Mauritiana (*Gob*). For the Ziziphus Mauritiana, its leaves were used for beautification and to wash dead bodies, and its crops as fruits. Based on this, a verse in a poem said: '*dhirtaba geed aan la jarin iyo ogow lama garaacaan go'i waayeyey inuu jiro*' [know that there are trees that deserve veneration and to be protected from cutting].

A verse in a second poem said:

- *Dhirtaba geed malka ah baa jir iyo lama garaacaane*
- *Dadkuna bir ma geyduu leeyahay iyo lama guhaadshaane*

- Some trees deserve veneration and are prohibited from cutting
- Some people deserve respect and to not be insulted

The second tree that deserved veneration and protection among the rural Somalis was the Acacia Bussle (*galool*). When praising horses, Somalis used to say '*ma galool ubax leh baa*' [the horse resembled Acacia Bussle with flowers]. The Acacia Bussle xylem was used to make *kabad*, a traditional mat used for interior house decoration. The Somali women used to praise *kabada* as '*geedba geedka u dheer laga garaacyey, galool mudhay mulaaxdiyyey*' [the material is from the longest acacia Bussle tree].<sup>8</sup> The *kabada* which was the most valued item in the traditional house was made of the xylem of the Acacia Bussle.<sup>9</sup>

A poet called Mohamed Fiin compared the most two valued animals – burden and diary camels – with shade trees:

5 Interview with poet Muse Ali Faruur, March 7, Hargeisa.

6 Suldan Diirye and Suldan Sheikh Madar

7 Interview with poet Muse Ali Faruur, March 7, Hargeisa.

8 For the Somali traditional house 'the kabad is the most important items, flowed by alool and caws'.

9 KII, Burco, March 24.

- *Gurgur lama qasho iyo hashii geela ka irmaane*
- *Guntana lagama Jaro geed haduu kuu gabaad yahay*

- You do not kill the burden and diary camels.
- You do not cut down shade trees.

The animals were known as *ma yeedhaan* (those that cannot talk). To Somalis, animals do not have intelligence (*garasho*) but have got a brain (*garaad*). This understanding informed human-animal relations showing that while animals cannot talk and lack intelligence, they still have brains and could develop relationships with humans. Based on this, the Somalis had informal, customary laws (*xeer*) that regulated human-animal relations. These laws were mostly communicated through storytelling (*sheeko xariiro*) and superstitions (*sheeko baraley*), told to children to teach them about human-animal relations. Somalis divided the animals that lived in their environment into four major categories. First, animals such as camels, goats, sheep, horses, and donkeys had economic and social value. Second, the hunted wildlife (*ugaadh*), such as dik-dik, were mainly hunted not for recreation but for medicinal purposes. Third were predator animals (*bahalo*) such as the lions, hyena and some snake species that could harm animals or humans. The fourth were harmless animals, insects and reptiles, such as the tortoise (*diinka*), or ants (*qudhaanjo*) and some snake species. People have different relations with different animals.

Somalis spoke for the *ma yeedhaan*. For example, the famous Somali poet Ismail Mire composed the well-known hoopoe (*Guuguule*) poem in the 1940s to complain about a devastating drought in northern Somalia and how it affected animals and humans equally. In a long poem Ismail Mire said:

- *Guuguulihiiyow hadaad Gu'ga u ooyeysi*
- *Haddaad mooddey keligaa inuu gubayo Jiilaalku*
- *Ama aad gabooyaha ku maran gama la diidayso*
- *Gidigood addoomaha waxa gaadhay seben weyne*
- *Gartaa maaha keligaa inaad gaar u cabataaye ...*
- *... Kama guuxo aargoonlihii geliga Toomoode*
- *Shabeelkii gabraar lagu idlee Giiro layn jiraye*
- *Oo godadkii kama soo ciyaan gabannadiisiye*

- Hoopoe, when you shed your tears
- Crying for the rains of spring
- And spurning the lightest wink of sleep
- Just because your craw is empty
- Do you imagine that you, and you alone?
- Are scorched by this drought? ...
- ... Never does the lion of the rocks now roar on Toomo plain
- And the leopards that once were killers of goats
- Have perished themselves at the hands of hunter

Another important poem is known as *bir ma geydo* [loosely translated as 'spared from the spear'] was composed by Haji Mohamed Guleid (nicknamed *dalaayad/umbrella*), a famous poet in northern Somalia stated that both trees and humans need to be spared from damage and destruction.

The most famous poem on Somali biodiversity is *qalin-ma-kooban* (not countable by the pen) by the late poet Ali Moge Gedi. In this poem, Ali mentions over 64 different trees in the Somali territories and their social and economic values (Yuusuf Ducaale, 2015).

### **Proverbs (*maah maah*) and environmental conservation**

One Somali proverb says, '*libaax nin ganay iyo nin galladay kala og*', loosely translated as 'lions could tell between who harmed and who did not harm them'. It is believed that when a lion encountered a group of men, it would attack those who had, or their relatives had, harmed a lion. The same applies to snakes. Somalis did not kill snakes for the sake of it. For example, when a snake entered a house, they would burn myrrh (*malma*) to chase it away without hurting it. Women also communicated to the snake by saying, 'we do not want to harm you, leave us alone and do not harm us'. They only kill if it attacked them first. A second commonly used proverb says '*wii sakaaro iyo way sokeeye midini ma hadho*' [loosely translated as 'unjust treatment of humans and unjustifiable killing of dik-diks will continue haunting those who committed it']. This is so powerful that it equates the cry of relatives to the cry of dik-diks, and the message is to not kill dik-diks for recreation. This also shows that when the Westerners were known for gaming and the Somali territories attracted sportsmen-naturalists, the locals were against gaming and killing animals for recreation. A third proverb says '*waa iga garanuug*' [I forbid it as I forbid the meat of *garnuuug* (a species in the gazelles family)] and whoever heard this proverb would not kill *garanuug* because he would know that the noble people do not have to kill it for feeding. Though it was not common, there were times when some people hunted and killed some animals for recreation; this is indicated by the proverb '*te deero ayaa tidhi dad la aragyaaba dhib la arag*' [deer said problems came with people] but still, this indicates that people used their oral literature to speak for animals like deer who could not speak.

### **Superstitions (*sheeko baraley*), stories (*sheeko xariiro*) and biodiversity conservation**

Superstitions and storytelling were used to educate children about environmental conservation. These covered different issues such as environmental hygiene (*fayo dhawr*) and animal and tree conservation. Children were taught that some animals, such as the tortoise and birds, have an evil eye (*cawri*).

**Animals:** Children raised with these superstitions believed them, and the superstitions influenced their behaviour into the adult stage. These superstitions were told during child-raising but people continued to believe them even when they got old. These superstitions were important to transfer social beliefs from one generation to the other. Harmless and slow-moving animals were mainly protected through superstitions. The tortoise was protected through superstition by children being told that if they used tortoise as back animals (*fuulid*), the tortoise has got an evil eye (*cawri*). Children were told that the tortoise did not always have the hard shield that covers it and the other animals had met and agreed to eat their meat. The tortoise was told this and responded that God was present when the animals were meeting and God would protect him; then God gave him this hard shield. The point was to teach children that God saved the tortoise and that they should not harm it. Women also protected the tortoise if it entered their rural compound; they put a handful of ghee on top of the tortoise and served it with milk, even though they knew it did not drink milk. They believed that the ghee would protect the tortoise from the sun.

Another superstition was that some animals and reptiles/lizards had an 'evil spirit' (*sheydaan baa ku jira*). For example, the dabb lizard (*caasho baddhi*) and monitor lizard (*maso cagaley*) were not



killed because it was believed they had an evil spirit which could cause anyone who harmed them to die or to lose his/her parents. This was a powerful superstition that protected these harmless lizards and reptiles from harm. If a monitor lizard, for example, entered the compound, women provided them with water and cautioned the children against harming them. Most of the lizards and reptiles were protected by this superstition. The chameleon was also believed to have an evil eye, and when it stood on a tree or entered the house it was not harmed; people found other ways to remove it without harming it. Another superstition was used to protect harmless snakes (*goodka/good cade*) because it was believed that they had the power to 'call for Islamic prayers'. While this might not be true, the superstition that this reptile could perform prayers psychologically influences children that they should not kill a harmless creature. Another reptile was the *jilbis*, a snake species that transports poison for snakes, which itself is harmless. If it entered the compound, women used to say, '*jilbisow rugta iyo reerkaba adigaa leh*' [Oh Jilbis, you own the family and space where the family live]. Somalis used to communicate with animals not to harm them, to leave them alone and the animals used to leave them alone too. These informal laws, some of which were more psychological, regulated the human-animal relationship. Animals followed humans knowing that they would get protection in places where humans live. The hunted wildlife was also protected through superstitions by believing that hunting could cause poverty and, based on this, those who had livestock shunned hunting; other animals like the *garanuug* (gazelle family) were believed to be animals for the evil spirits (*jin*).

The human-animal laws were not limited to lizards, birds, reptiles but also predators. Somalis believed that predators would only attack if they were harmed, but there would be no human-animal conflict if they were not harmed. The belief was that people did not attack an animal unless it hurt them, and the animals did not harm humans that did not harm them. An interviewed poet said: 'my mother encountered a lion when she was pregnant and alone. She communicated to the lion to not harm her as she will not harm him; after few minutes, he landmarked the land with his leg and left. The marking of the land was a sign of agreement that I will not harm you do not harm me'.<sup>10</sup> Also, Somalis believed that the hyena only attacked the domestic animals of people who harmed a fellow hyena. Based on this belief, Somalis did not kill a hyena unless it harmed them or their animals.

**Environmental hygiene:** Children were taught that they should dig a hole and bury the fragments when they cut their nails and hair. They were told that if they did not do this, they would be asked to collect their nails and hair after they die. This was to psychologically influence the behaviour of the children to keep the environment clean. Parents also told their children that cutting nails in the house and not burying them outside could cause poverty in the household, while cutting hair and not burying it could be dangerous as the hair could be used to spell a curse on them. Children raised with these superstitions believed them, and it influenced their behaviour to keep the environment clean. When poisonous snakes were killed, people did not want to contaminate the soil; they believed that if they dumped killed snakes on the ground, the snake would eat the sand, revive, and take revenge on the person who killed it at night. These superstitions were told during child-raising but people continued to believe them when they got old. These superstitions were an important way of transferring social beliefs from one generation to the next.

#### **Oral literature on climate change and disaster risk reduction**

The ICH was used for risk reduction. Somalis who specialized in astronomy (*xidigiska*) were known as *xidaar*, and they helped society to forecast weather changes such as droughts. One poem said:

10 Mohamed Bedel, Hargeisa, March 8.

- *cirkaan toban bilood di'in hadii caadba laga waayo*
- *oo ceelka ilihisa dhow cawska laga laasto*
- *oo geela caynabo ka fulay caado kor u dhaafo*
- *oo cirka waa taawilaa caamir lagu waasho*
- if it fails to rain for ten months
- and there is a scarcity of grass
- and the camels travel a long distance looking for pasture and water
- and people keep asking the astronomy expert for a forecast

Somalis did not emphasize climate change and its harmful effects, but they always voiced their praises or concerns about the seasonal changes such as droughts and abundance.<sup>11</sup> They claimed that life is composed of four stages, and therefore peace and abundance (*nabad iyo barwaaqo*) are on one side of the spectrum, and war and drought (*colaad iyo abaar*) were on the other side. Life was simplified and categorized into those four stages of either peace/abundance or war/drought. There was a Somali saying in which a crow was asked, 'which side of the range would you benefit from, or rather be on?' The crow replied that, 'since life is condensed into these four stages, I would rather be on the side of war and droughts. There would be many dead human bodies that I would find during the wartimes, and if it's during the drought, I will encounter several deceased animals. There are no benefits for me through abundance and periods of peace'.<sup>12</sup>

Some birds such as in Somali (*soo daf*) were believed to have the ability to tell the future, 'they used to say if you are sitting under a tree and the *soo daf* bird stands on top of the tree and sings, just see the direction the bird's tail is facing, and you will expect visitors from that direction'.<sup>13</sup> Other birds such as the *fiin* were also believed to have the power to predict future conflicts and rains as she could hear noise from the future. For the hunted wildlife (*ugaadha*), the gazelle (*cawsha*) was believed to do reconnaissance (*sahan*), for example, people used to say the gazelle can tell where it will rain so when the gazelle travelled, the pastoralists travelled with them.

#### **Challenges to the indigenous Somali intangible cultural heritage for environmental conservation**

Social changes (local and global) have affected the indigenous Somali ICH. As stated by one poem:

*Today's environment is different from the one I grew up in, people are no longer dependent on the environment for the traditional social, economic and medicinal services. The human-animal relations have broken down...we live in a different world.*<sup>14</sup>

Research participants were in consensus that these changes have affected the indigenous intangible cultural heritage. One major challenge is lack of ICH transfer to the future generations. Senior Somali

11 Yusuf Shaacir

12 Yusuf Shaacir

13 Mohamed Badal

14 Participant from the elder group.

citizens are dying with the ICH stored in their memories. All sorts of indigenous knowledge, like oral literature, poems, proverbs and superstitions will disappear and be forgotten in the future, in both rural and urban settings.

The vanishing rural household possessions also makes people forget the importance of the environment. In the past, 100% of rural household possessions came from the environment. As stated by an interviewed elder:

*Water container [Kalax], food container [xeedho], fork [fandhaal], eating mat [weedhaalis], milk container [hadhuub], ladle [dhure], were all traditional and from different trees...but today, this is a history.*<sup>15</sup>

Everyday social life reminded people about the importance of the environment and once everyday reminders are lost, the importance of the environment is not appreciated.<sup>16</sup>

In the last decades, people have been challenging the intangible cultural heritage, such as the superstitions, saying they are 'untrue'.<sup>17</sup> The education system has contributed to this because contemporary religious leaders tell people that superstitions are untrue, therefore, should not be believed. This has had negative consequences as people have started to disbelieve important indigenous knowledge that regulated human behaviour. For example, the children no longer bury their nails and hair; they no longer protect animals because the current generation does not believe those superstitions that children used to believe in the past. The younger generation is no longer being told about the superstitions that were used to conserve the environment. They do not know which animals have an evil eye or which animal has supernatural powers to forecast the future. As a result, children have become unruly and no strong and functional formal institutions can replace the endangered ICH.

The introduction of modern automobile transport has also contributed to the challenges and threats facing the Somali environment. The British colonialists used marram roads to demarcate the borders that divided the Somali territories into several countries. The rural people saw automobiles that were used for the road construction; both the road construction and automobiles in the rural areas were new to them, and they anticipated that such changes had the potential to pose serious environmental problems that would threaten their rural livelihoods. A man called inna Aw Abdi Hashi saw the cutting down of trees and expressed his concern in a poem:

*Dhalinyardu hadalkii naxwaleh dhab uma  
qaataane Rag dhamaaday baa garan lahaa  
dhoobahan ridaye Mar hadii dhulkeeni xadkaa  
dhereran looyeelay  
Oo lagu dhib tiray boodhi kaar wada dhabeynaaya  
Dhalaan weeye kii heybiyaa dhaqashoxoolaade*

Youth do not listen to the wisdom  
The old generation could understand my wise words

15 Group discussion, Burao

16 Hassan, group interview, Burco, March 24.

17 Group discussion, Burao

If our land has been divided with a straight borderline  
And there are plenty of automobiles  
It is childish to think about a sustained livestock production

The poet, who did not have formal education, perfectly foresaw that automobiles would cause the environmental degradation which has become a reality today. However, society was always divided on certain issues, including environmental conservation. For example, a man who heard inna Aw Abdi Hashi's poem responded to him:

*Dhabarkaaga may marin wadada dhereran  
Xaashowe Dhalin hadada u heyso iyo ragii dhuran  
lahaa xooga Soo dhoob halkan baa laga dherгаа  
dheebanlacageede*

The road has not passed through your spinal cord  
If you have workforce who can work  
Bring them here to make money for themselves

Automobiles have changed the rural tradition of pack camels, which threatens to vanish. The automobiles do not have designated roads in the rural areas as they change routes at will, leaving trails of tyre marks on the road, which turn into eroded land with canals.

The change in the ICH is taking places while institutions (both formal and informal) have corroded and are largely nonfunctional in conserving the environment. This has resulted in uncontrolled charcoal production and cutting down trees for the ever-increasing urbanization in the rural settlements. A local adage says *geed geed cunaya* [sacrificing tree for a tree] which indicates that rural men burn trees for charcoal production to finance their Khat-chewing lifestyle.<sup>18</sup> The environment that used to be conserved has become a source of livelihood for some people. In the past, Somalis were 'rural people' and 'urban people', but during the war the urban people fled to the rural areas and rural settlements and exposed their urban lifestyle to the rural people. Both rural and urban people have the same mindset, food, lifestyle and expenses.

## Conclusion

Somalis had a rich intangible cultural heritage which can be seen in poems (gabay), proverbs (maah maah), superstitions (sheeko baraley), and stories (sheeko xariiro), all of which provided informal institutions that constrained and guided human behaviour to live in harmony with the environment. Both formal or informal institutions regulate human behaviour; if the informal institutions have weakened, then the role of formal institutions in environmental conservation is important, in the Somali context, both institutions have eroded. With the parent and current generations, the concept of environment has become broader and covers all living things, but this has not been translated into increased environmental conservation due to the weakened ICH. Climate change and loss of biodiversity are two major concerns, but unlike in the past when Somalis expressed their concerns with oral literature, the current generation have not carried on expressing these environmental concerns with oral literature, mainly due to the weakened ICH. Many

18 Khat is a mild stimulant leaves imported from Ethiopia and Kenya that has become common among the Somali men in rural and urban areas.

of the current generation of poets do not have a direct relationship with the environment as they live in urban areas, while others believe that citing poems when there is no government that can act is meaningless. However, there are new opportunities and ways to address the environmental concerns that have been contributed to by the weakened ICH. These include documenting and integrating ICH into the education system and taking advantage of technology, which has penetrated into the rural areas, to educate the people about the importance of ICH, especially when it is used for environmental conservation. To achieve this, the role and expertise of international partners such as UNSECO and UNEP is essential.

## Recommendations

- Somali ICH is not written; it is stored in the memories of the senior citizens. Once they die, they take the wealth of ICH with them. Comprehensive research is necessary to document the ICH stored in the memories of older people across the Somali territories.
- To revive the vanishing ICH, it is essential to re-educate the younger generation about the rich Somali ICH. This can be achieved through systematic programmes such as including the ICH in the education curriculum
- Some schools offer subjects on environment, but this needs to be localized and contextualized so that children learn about different trees and animals in the Somali territories and their social and economic values. The photos of trees, including endangered ones, should be kept in schools.
- The Somali education system, including the Islamic, is a mix of imported and unregulated curriculums some of which denounce parts of the ICH, such as the superstitions. This must change as superstitions represent an indigenous knowledge that must be valued.

## Summary of the case study

Somaliland ecology is largely semi-arid, supporting extensive livestock production and rich wildlife. In the absence of functional formal institutions that could protect the environment, Somalis used oral literature (*sugaan*), including poems (*gabayo*), proverbs (*maahmaaho*), superstitions (*sheeko baraley*) and storytelling (*sheeko xariiro*) to constrain human activity that could adversely impact the environment. Somalis invented and transferred this oral literature from generation to generation. Findings from this study show that level of education and age influences the understanding of the concept of environment. The grandparent generation understood the environment (*deegaan*) as the inhabited physical spaces/territories. The parent and current generation have a broader understanding – that the environment is where people, animals, insects, reptiles, and trees co-exist and together live in peace.

Somali intangible cultural heritage (ICH), including poems, proverbs, superstitions, and storytelling, regulated the relationship of humans with their environment and provided informal, traditional laws (*xeer dhaqameed*) that, for example, reduced human-animal conflict and promoted humans living in harmony with the environment. The Somali nomadic community had a strong relationship with trees and animals in their environment. For the trees which provided different ecological services, including shade and fruits, the society prohibited *gurmo go'an*, cutting trees from a point where they will not regenerate. *Gurmo go'an* was considered a curse.

The animals were known as *ma yeedhaan* (those that cannot talk). To Somalis, animals do not have

intelligence (*garasho*) but have a brain (*garaad*). This understanding informed human-animal relations showing that while animals cannot talk and lack intelligence, they still have brains and can develop relationships with humans. Based on this, the Somalis had informal, customary laws (*xeer*) that regulated human-animal relations. These laws were mainly communicated through storytelling (*sheeko xariiro*) and superstitions (*sheeko baraley*) to children to teach them about human-animal relations. Somalis divided the animals that lived in their environment into four major categories. First, animals such as camels, goats, sheep, horses, and donkeys which had economic and social value. Second, the hunted wildlife (*ugaadh*), such as dik-dik, which were mainly hunted for recreation and medicinal purposes. A third was predator animals (*bahalo*), such as the lions, hyena and some snake species that could harm animals or humans. The fourth were the harmless animals, insects and reptiles such as the tortoise (*diinka*), or ants (*qudhaanjo*) and some snake species. People have different relations with different animals. Somalis spoke for the *ma yeedhaan*. For example, the famous Somali poet Ismail Mire composed the well-known hoopoe (*Guuguule*) poem in the 1940s to complain about a devastating drought in northern Somalia and how it affected animals and humans equally.

Superstitions and storytelling were used to educate children about environmental conservation. These covered different issues such as environmental hygiene (*fayo dhawr*) and animal and tree conservation. Children were taught that some animals, such as the tortoise and birds, have an evil eye (*cawri*). Children raised with these superstitions believed them, and it influenced their behaviour, for example by keeping the environment clean, when they became adults. Some bird and gazelle species were used for disaster risk reduction as it was believed they had the power to predict future conflicts and rains.

Social changes (local and global) have affected the indigenous Somali ICH. One major challenge is lack of ICH transfer to future generation. Senior Somali citizens are dying with the ICH stored in their memories. All sorts of indigenous knowledge like oral literature, poems, proverbs and superstitions will disappear and be forgotten by future generations in both the rural and urban settings. The vanishing tangible rural household possessions also make people forget the importance of ICH.

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Group discussion in Burao (Photo credit: Hamse Hussein)



Interview with Abwaan Yusuf Shaacir, a famous poet (Photo credit: Awke, SOYDAVO)



Interview with Abwaan Muuse Cali Faruur, famous poet and cultural expert (Photo credit: Awke SOYDAVO)



One of the indigenous Somali birds (Photo credit: Hamse, SOYDAVO)



Somali black headed livestock at water well in Burao (Photo credit: Hamse, SOYDAVO)



Famous Tree called Berde in Wadaamagoo (Photo credit: Hamse, SOYDAVO)



Somali camel at water well in Oodweyne (Photo credit, Hamse, SOYDAVO)

# South Sudan

## The Roles of Traditional Knowledge Systems on Biodiversity Conservation, Climate Change, and Disaster Risk Reduction in Eastern Africa: A case study of flood disaster in Gondokoro Island, South Sudan

Mr Mark Oloya Nekemiah



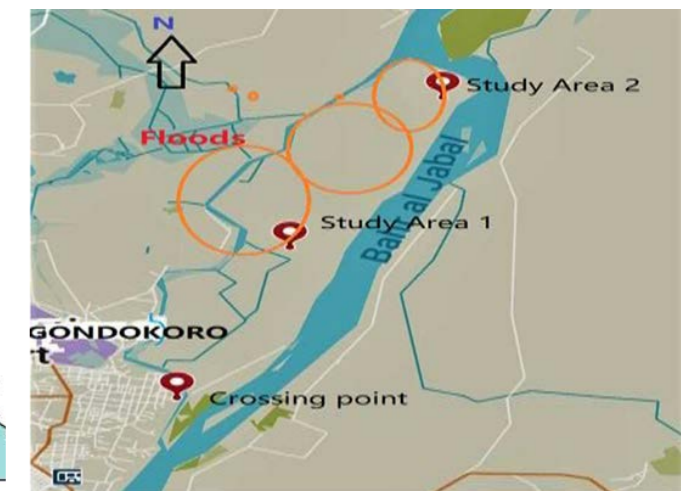
Photo credit: Patirik Nyombe

South Sudan is one of the newest countries located in north-eastern Africa. South Sudan's capital is Juba and the country gained its independence on 9 July 2011 after a protracted civil war between the government of Sudan and the Sudan People's Liberation Movement/Army (SPLM/A). It was estimated that over two million lives had been lost in the war. After two years of relative peace, on 15 December 2013, and again in 2016, civil wars broke out between the ruling parties until 2018 when a re-vitalised peace agreement was signed between the warring parties.

Despite the successive civil wars, the country has a many natural and social endowments. Its rich biodiversity includes lush savannas, swamplands, and rainforests that are home to many species of wildlife. Socially, South Sudan was settled by most of its current ethnic groups during the 15<sup>th</sup> to 19<sup>th</sup> centuries. After that, the Sudan region was invaded, in 1820, by Muhammad Alī, viceroy of Egypt under the Ottoman Empire. Therefore, it is estimated that South Sudan has about 64-70 ethnic groups with rich cultural or traditional practices.

### Geographical location

The two selected research locations are *Murkuku/Kujonok* and *Kango* in Gondokoro Island in Juba, Central Equator State.



The map shows the locations of the study with the following coordinates:  
4.88339, 31.635199 and 4.91488, 31.653014

### Background to the case study

As South Sudan is one of the new countries in the world and it is reeling from the effects of 21 years of civil war between North Sudan and South Sudan, and subsequent civil wars in 2013 and 2016 in South Sudan. In addition, South Sudan was hard hit by floods, due to climatic changes, and invasion of desert locusts in 2019 and 2020. Abnormally heavy seasonal flooding has been devastating large areas of South Sudan since July 2019, with an estimate of 908,000 people affected. The rains, unusually, continued until the end of November, putting even more people at risk. These rains hit areas that were already facing high humanitarian needs. Across the 32 flooded counties in

Jonglei, Upper Nile, Warrap, Eastern Equatoria, Northern Bahr el Ghazal, Unity and Lakes, more than 3 million people were reported in need of assistance even before the rains. More than 60 per cent of the flood-affected counties were classified as facing extreme levels of acute malnutrition, mostly impacting children and new mothers. Early estimates suggested that at least 17,000 hectares of productive land, equal to some 20,000 metric tons of food production, had been destroyed.

As well as the flooding, a swarm of desert locusts entered South Sudan. The swarm originated in the Middle East, during the winter of 2018, after the Red sea cyclone. It hit Asia in 2019 and moved to the east African countries of Ethiopia, Kenya, Sudan, Somalia, Eritrea and Uganda between December 2019 and June 2020. After devastating crops in Uganda and Kenya, the desert locusts first invaded Magwi County in the Eastern Equatorial State of South Sudan. The invasion worsened food shortages in a region where up to 25 million people were already suffering from three consecutive years of droughts and floods. Most of the affected population was dependent on humanitarian assistance, which sometimes does not arrive on time.

The study therefore intends to research and document the roles of Traditional Knowledge Systems on climate change and disaster risk reduction in Eastern Africa with special reference to South Sudan.

## Statement of the problem

It is a truism to state that prior to colonialism in South Sudan, traditional knowledge systems played a significant role for the survival, development, protection and sustainability of the various communities in South Sudan. However, with the advent of colonialism and subsequent introduction of formal education, traditional knowledge systems were relegated in favour of scientific knowledge. Consequently, not much effort was put into researching and documenting the invaluable role of traditional knowledge systems in supporting and protecting the sustenance of the various communities of South Sudan. During the 21 years (1983- 2005) of civil war between the North and South Sudan, and subsequent civil wars in 2013 and 2016 in South Sudan, during times of famine or drought most affected people relied heavily on humanitarian assistance for their survival. Nevertheless, due to the scarcity of such assistance, most affected people resorted to traditional knowledge systems to support their survival. For instance, the eating of edible plants. Furthermore, the safe and relatively equal distribution of humanitarian assistance to the affected population relied, mostly if not completely, on the support of traditional leaders. This contribution of the traditional knowledge systems, and the support of the traditional leaders, has not been appreciated, researched or properly documented in order to support the delivery of subsequent assistance by the concerned authorities and also to assist in disaster risk reduction.

Similarly with the 2019 and 2020 invasion of desert locusts and the floods in South Sudan, the humanitarian community and the Government of South Sudan provided some assistance. However, as humanitarian assistance most often arrives late and is not sufficient to support all of the affected population, most affected communities still depend on their traditional knowledge systems to support their survival in times of need, or to avert further disaster and reduce possible risks. Therefore, as both traditional knowledge systems and scientific knowledge are social constructs for maintaining the wellbeing of humans, this case study aims to research and document the traditional knowledge systems of the affected population in South Sudan with regards to the 2019 and 2020 flood disaster. This is in line with the mission of UNESCO's 2003 Convention for the Safeguarding of the Intangible Cultural Knowledge and Heritage.

## Objectives of the case study

The overall objective of the case study is the research and documentation of traditional knowledge in relation to climate change and disaster risk reduction in the selected areas in South Sudan. Other minor objectives are as follows.

- Research and document the background of the disaster.
- Research the ideological framework or beliefs of the community relating to the disaster.
- Discover the impacts (negative and positive) of the disaster on biodiversity.
- Discover the cultural coping strategies used during and after the disaster in terms of risk reduction.
- Discover the cultural communication strategies employed in terms of disaster risk reduction.
- Discover what (if any) cultural leadership or governance was demonstrated in terms of disaster risk reduction.
- Discover how the community was organized during the disaster.
- Document the effectiveness of the cultural knowledge systems in terms of risk reduction and related challenges.
- Discover the tools or artefacts used in terms of disaster risk reduction.
- Document all existing strategies or means for safeguarding the knowledge systems and to ensure their transmission to future generations for the preservation of the traditional knowledge systems for subsequent disaster risk reduction.

## Case study focus

The case study focused on research and documentation of community knowledge systems in relation to flood disaster risk reduction in Gondokoro Island of the Central Equatorial State of South Sudan with reference to the following.

- The genesis of the disaster and the knowledge systems or beliefs about the disaster.
- Community knowledge about flood disaster, adaptation and mitigation.
- Cultural strategies or coping mechanisms during and after the flood disaster.
- The efficacy of and challenges to the cultural knowledge systems during and after the disaster.
- The tools or artefacts used for disaster risk reduction.
- Cultural communication strategies employed during the disaster management.
- Cultural leadership or governance demonstrated during the disaster management.
- Community organization during the disaster.
- The strategies employed for the preservation of the traditional knowledge systems for subsequent disaster risk reduction.

- Any other relevant information the community will provide with respect to the disaster being studied.

## Proposed research design, methods, procedures

The research was carried out in collaboration with National Ministry of Culture, Museums and National Heritage, the State Ministry of Culture, Youth and Sport, and the State Relief and Rehabilitation Commission (RRC). The research consists of three main phases, namely: preparation, data collection, and data analysis and reporting. Preparation involved the signing of contracts with the UNESCO Country Office, the finalizing of tools, the development contacts with state authorities, logical arrangements, and travel to the field. Data collection included community mobilization, preliminary community briefing about the research and consent seeking – the signing of video and photo forms. Once community consent was achieved then the conducting of community consultative meetings on the case study followed. The methods used for data collection were: holding a community consultative meeting, observation, visit to the site to see tools used during the disaster risk reduction process, taking photos and video for documenting the process.

### Literature review

The realization of the importance of traditional knowledge systems for maintaining different communities in their socio-cultural, economic, political environments has prompted several studies to be conducted to understand the significant of cultures for inter alia disaster risk reduction.

For instance, Hewitt (2008) collated the different views of participants in a global e-conference on Culture and Risk in 2008. One of the strongest views was the statement of Mohammad Zaman (freelance consultant, Canada) that:

*People's perception, knowledge and 'world-view' shape their understanding of disasters and thus influence their responses significantly.*

Furthermore, Arrey Mbongaya Ivo (African Centre for Community and Development, UK) believes that:

*Cultures have tangible and intangible influences on people [but] are vital in designing holistic policies for risk and natural disaster management.*

Also Professor P.C. Joshi (Department of Anthropology, Delhi University, India) suggests that:

*Culture, as a shared, learned, and transmitted body of knowledge, beliefs, and practices, plays a very important role in our perception, understanding, and activities undertaken to mitigate, manage, and face the disaster.*

Additionally, Mohammad Ahsan Khan (Rural Development Project, Pakistan) finds that:

*Socio-cultural settings do affect the ways in which people choose to respond to any disaster. Proactive, passive, or poor responses to any disasters are inextricably linked with different socio-cultural settings. Culture, the way of living (set of values, norms, beliefs, and social*

*organisation) of any community plays a catalytic role in developing people's responses. Different social settings within a given culture not only shape people's knowledge but also influence their skills and practices thus affecting their behaviours towards a given situation and are the key driving forces to shape people's behaviours to respond to any disaster-like situations.*

At the end of the e-conference four propositions had been put forward as follows.

- **Openness:** An approach which brings DRR into the broader context of development and climate change; and conceives natural hazards and risks not as being purely environmental and technical issues but also, and mainly, as being socio-cultural, economic, and political issues; disaster risk reduction requires reducing already existing vulnerabilities.
- **Partnerships:** In a globalized world characterized by rapid change, growing uncertainties, and complexities, partnerships between and among different groups and sectors acting at different scales simultaneously or not, are necessary to develop innovative solutions and allow resources exchange for improved disaster risk reduction.
- **Empowerment:** Finding ways to give greater power and resources for (mainly 'local') communities to take on more of the tasks of vulnerability reduction and safety measures; a rights-based approach to knowledge and safety initiatives, intended to guarantee that local and outside knowledge will not be abused and full participation of people at risk.
- **Involvement:** An ethic of contact, translation, facilitation and 'intervention' for all of us professionally identified with the risk and disaster field, especially where new initiatives are being introduced, supporting effective and sensitive 'cultural' respect and dialogue; this will contribute to better understand and account for communities' needs and priorities in order to reduce already existing vulnerabilities.

Weesjes (2016) points out that communities that experience large-scale disasters can be further traumatized when outside organizations responding to the event fail to consider local culture, expertise, and capacity. Enrico Quarantelli identified this problem as early as 1988 and called for more understanding of the differences in communities to encourage collaboration. He observed that local emergency management groups are as diverse as their communities and because of this, imposing standardized response models from federal or state entities was doomed. Furthermore, Katherine Browne (2015), who studied recovery after Hurricane Katrina, came to a similar conclusion. She found that following Katrina, federal authorities arrived in Louisiana with a template or a set of preconceived notions of how recovery would unfold without taking into account culture and capacity. Browne noted that these 'outsider' decisions, forms, and actions left survivors with 'no sense of participation in the process and no way to refine the template to match realities of their lives.' Consequently, the international emergency response and disaster risk reduction community is beginning to understand that inclusion and more culturally-responsive disaster management should be part of their agenda.

In their training materials for the Disaster Response Counsellor Certification, the New Jersey Department of Health/Division of Mental Health Services (n.d.) suggest the following in response to disaster.

- A disaster responder should have two primary ways to reach their Limited English Proficient (LEP) population: either through speaking in a language they will understand, or by providing



documents that are in their primary language. These two services are accomplished through the use of interpreters or translators.

- Interpreters to work with disaster personnel and individuals affected by a disaster to ensure they understand one another in conversation. Examples of interpreters include bilingual staff, dedicated interpreters, telephone interpretation services, or community members.
- Translators to adapt the written word from one language into another. Examples of materials that may be translated include consent forms, treatment or discharge instructions, and any forms completed by patients. Graphics and signage may also be translated so LEP individuals can navigate through health care settings.
- Finally, disaster responders should foster real collaboration to co-create new interventions. Create services based upon knowledge from within the culture, then slowly introduce innovations from beyond the culture.

Munyaneza et.al. (2009) analysed the place of Rwandan traditional cultural practices in the conservation and protection of biodiversity. They noted a certain number of cultural practices which contributed to the safeguarding of a great number of species of Rwandan flora and fauna. The practices are based on the fact that the people of Rwanda appreciate the biological resources in various aspects: spiritual, economic, esthetics and cultural. They have systems of belief as well as social standards which encourage or impose limits on the exploitation of certain biological resources. The cultural rites – like the respect of ancestors, the worship – like *Kubandwa* and *Guterekera*, and traditional cultural practices – such as traditional medicine, significantly contributed to the safeguard of biodiversity.

In integrating culture in Disaster Rapid Response (DRR), the Culture and Disaster Action Network (CADAN), NSF, and the American Anthropological Association (n.d.) observe that culture permeates, shapes, and defines the physical, economic, and social environment. They further maintain that integrating cultural knowledge in DRR leads to successful programs; as every human group and human being is influenced by cultural factors that shape their decisions and viewpoints. In a study based in Afghanistan, CADAN et.al. concluded that understanding cultural context, traditions, and values can make all the difference in whether DRR initiatives are accepted and applied.

A paper produced by the International Institute of Rural Reconstruction and Cordaid (2011) captured the lessons learned from Ethiopia, Kenya and Uganda. The lessons revolve around community governance, participation, costs, traditional customs and beliefs and partnerships.

- **Governance:** Cordaid observes that the local communities exist within structures. These structures define leadership responsibilities, reporting structures, and conflict resolution mechanisms. The community leaders are opinion leaders and have considerable influence in mobilizing support, acceptance and ownership from the community. Whenever these leaders have been involved in any development work, the projects have been more successful and sustainable than when they have not been involved. Communities have traditionally had their indigenous ways and institutions for handling disasters, including early warning systems and environmental conservation. However with modernization, the practices have since been disregarded or forgotten altogether. Identifying, building on and improving the practices will enhance ownership of the projects. Equally important and beneficial to the community for posterity is the ability to document these practices. The local capacities must be considered

even as new ways emerge; and, when necessary, working with research institutions is advisable. Participating in CMDRR builds the capacities of community members. At the centre of the CMDRR approach is its ability to enhance collective action and social relations of all stakeholders. Working through established community structures and getting the buy-in of local government from the start hastens acceptance and paves the way for support. Organized communities are in a better position to lobby for more support from the government and other development actors.

- **Participation:** Taking time to understand the social-physical dynamics will determine the process and final outcome of the project. Involvement at all phases of the development process contributes to change of attitude, enhances ownership of the process and the sustainability of the initiative. Working together to achieve common goals unifies the communities.
- **Costs:** A well-facilitated risk-assessment process allows for early identification of local resources and mobilization of the community both as an existing resource and their tools of trade. This cuts the costs of implementation. Investing in the development of local capacities helps to reduce costs of project follow up.
- **Traditional customs and beliefs:** In working with the communities, it is important to know these and to work from what they know and practice. Total disregard for their way of doing things may create resentment and/or rejection of new ideas. Sensitization workshops allow people to appreciate the benefits of embracing new practices especially in the wake of adverse effects of climate change.
- **Partnerships:** Cordaid further advises that organizations working with the communities need to partner with the government (which is charged with the responsibility of providing basic services) and other NGOs to ensure effective use of resources. When a pilot project records success, other actors, including the government, are more willing to replicate the practice in other areas with similar conditions. Additionally, it is prudent to appreciate what other development actors are doing in the area to avoid duplication of efforts and to maximize use of resources.

On the subject of health, Clark et.al (2014) remark that there is emerging evidence that bio-diverse natural environments have the potential to impact on human wellbeing and health through the indirect cultural pathways. They are of the opinion that better understanding of the relationship between biodiversity and health along cultural pathways has the potential to further our appreciation of the value of biodiversity, provide increased support for biodiversity conservation, and contribute towards reducing the occurrence and associated costs of ill health.

It is clear that one of the characteristics of culture is its universalism and the above literature review shows that traditional knowledge systems still play a critical role in disaster risk reduction, biodiversity conservation, and disaster risk response (DRR) across different cultures throughout the world.

### Population and study sample

As there is no clear population statistics for most parts of South Sudan, the study population was mainly be the community members directly affected by flood in Gondokoro Island and the selected areas. The study sample were representatives from the local authority and community; namely chiefs, women and youth. Other representatives included were members of staff from those government ministries which played a critical role during humanitarian risk reduction.

### Sample size and selection of sample

Non-probability sampling approach was applied. About 20-30 participants were invited to participate

in the community consultative meeting. Thus, convenience (i.e. ease of access) for the sample, and purposive (who should be in the study) approaches were used for selecting the sample in order to factor in study time and the available funds for the study.

## Sources of data

### Primary source of data

The primary source of data was from the affected community or population living in the area. Other sources included humanitarian agencies, the ministries of the Government of South Sudan (GoSS) that participated in alleviating the disaster, namely: the State Ministry of Culture, Youth and Sport and the State Ministry of Agriculture and Environment.

The primary source of data was collected *in-situ* i.e. where the community members reside and where the disaster happened. In this case, the Bari people in Gondokoro Island in Juba, Central Equatoria State.

### Secondary source of data

The secondary sources of data include reports from various UN agencies, International Non-Governmental Organizations, National Non-Governmental Organizations and Government institutions e.g. the Ministry of Humanitarian Affairs, and Ministry of Culture.

## Collection of data

Primary data was collected through community consultative meetings, observation in the field during a field visit, and key informant interviews. Thus, data collection conformed to the spirit of triangulation in order to arrive to realistic conclusions.

## Data management

All efforts were geared toward collecting data from the right respondents using the right methods and technology; handled and analysed by the right person(s) or researchers and handed over to the right authorized person assigned to co-ordinate this study at UNESCO, South Sudan Country Office for confidentiality. In short, the data management revolved around three strategies: process (methods), people (respondents and researcher) and technology (tools).

## Data analysis strategies

Data was analysed qualitatively using content analysis approach. In order words, data was grouped under main headings and sub-headings for developing the report.

## Ethics considerations and human rights issues

Ethical considerations and human right issues were observed throughout the study. This means that prior consent was sought and approval given by the community leaders before starting the study in accordance with UNESCO's guidelines. Furthermore, the findings of the study shall be kept with strict confidentiality and handed over to UNESCO South Sudan Country Office for safe keeping in conformity with the purpose of the case study.

## Strengths and limitations of the case study

The Case Study has the following strengths and limitations.

### Strengths

- The findings will contribute to the existing body of knowledge on the functional roles of traditional knowledge systems on climate change and risk reduction with special reference to South Sudan amongst the Bari people in Gondokoro Island.
- The study will provide invaluable information to government stakeholders and communities who need to respond at the time of disaster; inventory community knowledge for disaster response; capacitate community to be part of mitigation at the time of disaster and partners for advocating the preservation of traditional cultural knowledge systems for inter alia disaster risk reduction.
- The case study will reveal some of the traditional strategies being used, the role of community structures, and the importance of traditional knowledge systems at the time of crisis and which have been safeguarded.
- The findings shall be useful to augment the efforts of the Government of South Sudan and the humanitarian community in tapping the invaluable traditional knowledge systems or reservoir for any disaster risk reduction i.e. building a partnership with the local community in disaster risk reduction.
- The study will help to continue the dialogue on the role of community in disaster/emergency and the need to safeguard community knowledge for generations.
- It will encourage the safeguarding of Intangible Cultural Heritage in South Sudan

### Limitations

- The main limitation of the study is that the findings are specific to the Bari people in Central Equatoria State (CES) and the disaster under study; as such the results cannot be generalized to other communities in the South Sudan or regionally and/or globally.
- As the study was carried out ten months after the flood disaster, the findings are limited to what the affected community could remember about the flood.

## Findings

The key findings suggest that there is available community knowledge on flood disaster, and community preparedness, this being a common type disaster with a high frequency of occurrences.

### The impact of the flood disaster on biodiversity

The flood started at night in May 2020 and the cultural coping mechanisms during and after the flood proved effective in spite of the devastating effects on the community's shelter, agriculture and biodiversity – e.g. farm land occupied by water; trees, animals and insects being killed or swept away by the flood.

### Cultural coping mechanisms during disaster

Some of the cultural coping mechanisms used during the disaster were as follows.

- The digging of channels in the compound for diverting flood waters away from the homestead so as to avoid the destruction of houses.

- The opening of a hole or holes in the walls of houses to allow the water to flow outside.
- Moving to higher ground within the island, on the eastern side of the River Nile. Both humans and wild animals scrambled to higher ground for survival.
- Sharing of food, often fish, with the most vulnerable members of the community.
- The use of canoes for rescuing and transporting children, older people, and equipment to safer areas.
- The harvesting of certain wild plants – such as water lilies – for food.
- Cooking on top of metal barrels while standing in the flood water, and covering the head against the rains with basins normally used for washing.

### **Cultural coping mechanisms after the disaster**

After the flood disaster the community used the following coping mechanisms.

- The use of personal savings to buy foods.
- The selling of domestic animals and other assets, such as motorbikes, to buy foods.
- The use of flood water for drinking, irrigation and planting of fast-growing green vegetables – such as okra and maize – to take to the market to sell.
- Changing of diet.
- Sleeping outdoors, under mango trees.

### **Discussion and conclusions**

The first flood was reported in 1964 and the community in Gondokoro Island experienced nine flood disasters around the time of the case study. Consequently, the Bari community residing in Gondokoro Island has available community knowledge on flood disaster and community preparedness for this ‘common type disaster’ with a frequency of occurrences. The cultural coping mechanisms during and after the flood proved to be very effective as there were no reported cases of loss of human life. However, the coping mechanisms were still rudimentary and could not withstand the magnitude of the flood. As a result, most of the community members living on the island were evacuated to the eastern part of the River Nile and other members still residing on the island took refuge on higher grounds. Therefore, at the time of the study in March 2021, ten months after the flood disaster, community members were and are still in dire need of humanitarian support especially, shelter, food and health services.

In spite of the negative effects of the flood (i.e. destruction of houses, farm lands occupied by water and loss of some biodiversity – e. g. wild animals, insects and mango and lemon trees), the flood brought a lot of fish for community consumption and sale, streams within the community that had been dry for about twenty years were filled up with water, and the community members are now using the water for drinking and irrigation – i.e. watering of green vegetables meant for sale.

In conclusion, the study, the first of its kind, unravelled the knowledge of the Bari community and their cultural coping mechanisms for flood disaster risk reduction, the limitations of those coping mechanisms in view of the magnitude of the flood, and the support the community needs for full recovery post-flood disaster.

### **Recommendations**

On the basis of the findings, and as the flood disaster is most likely to reoccur, the following propositions have been put forward for possible consideration by UNESCO and the Ministry of Culture, Museums and National Heritage.

- Strengthening of community ability: There is need to strengthen community ability to respond. Early warning system must be enhanced, and awareness increased for communities living in disaster-prone areas. A community emergency response team should be established, trained and equipped.
- Humanitarian support: Ten months after the flood disaster, the community has not fully recovered and there is a need for the provision of temporary shelter, food and health services.
- Livelihood and WASH (Water, Sanitation and Hygiene) project: There is need to strengthen community livelihoods by, for example, the restocking of lost domestic animals, the provision of resources for farming (e.g. hoes and other tools, seeds), increasing the number of canoes. There is also a need to support the community in access to safe water and support in the construction of community emergency latrines.
- Community resilience centre: Since the area has been flooding since 1964, it is likely to happen again. Hence, there is a need to establish community resilience centres on higher grounds with a capacity for 300 households, for subsequent floods.
- Insecurity: It is important to share the findings with the Government of South Sudan so that the relevant authorities can address the current insecurity in the area being caused by other neighbouring communities (e.g. children’s abduction in the eastern bank of the Nile where most community members have been displaced or evacuated).
- Cultural preservation centre: Establish a cultural preservation centre for educating the youth on the importance of traditional knowledge systems; promote the integration of traditional knowledge systems in disaster risk reduction; and support the community in disaster preparedness – e.g. a single warning system or alarm for an impending flood disaster.
- Disaster emergency funds: Establish an in-country, unrestricted emergency fund for conducting similar studies during any disaster in order to obtain first-hand evidence or data on the coping mechanisms or the use of traditional knowledge systems during any disaster that might strike any of the communities in East Africa.

### **Summary of the case study**

South Sudan is one of the newest countries located in north-eastern Africa. It gained independence on 9 July 2011 after a protracted civil war between the Government of Sudan and the Sudan People’s Liberation Movement/Army (SPLM/A). In 2019 and 2020, South Sudan was hit hard by disasters (desert locusts and floods) with devastating effects.

The purpose of this case study was to research and document the ‘Roles of Traditional Knowledge Systems on Biodiversity-Conservation, Climate Change and Disaster Risk Reduction in Eastern Africa: A Case Study of South Sudan Flood Disaster in Gondokoro Island in 2020’.

The research was conducted by a team of six people, between 17-18 March 2021, in two locations (Murkuku and Kujonok/Kango), at boma inhabited by the Bari people. A community guide

questionnaire, key informant interviews, transect walks, observation, photography and videoing were used in the study. Prior to the study, free, prior and informed consent was sought from the community and photograph and videoing rights granted to UNESCO by representatives of the community signing the photography and videoing forms.

The findings suggest this is a 'common type disaster' with a frequency of occurrences and that there is available community knowledge on flood disaster and community preparedness. The negative effects of the flood are to be found on the community's shelter, agriculture and biodiversity. Most houses were destroyed and some still under water. Farm lands were also under water and deserted, and many insects perished. Many mango and lemon trees are still under water and others have dried up and died or been uprooted. Also some domestic animals had been swept away and many wild animals were displaced as they scrambled for higher grounds, along with the humans, for survival during the flood.

During the flood disaster, the cultural coping mechanisms for disaster risk reduction were inter alia evacuation to the eastern part of the River Nile using a motor boat; moving to higher grounds for safety, use of canoes for rescue operations (e.g. children, property and the elderly) and sharing of food with the most vulnerable. Additionally, the leaves of palm trees were used for preparing bedding for children on wet grounds, metal barrels were used for cooking and burned bricks, and pieces of iron sheets were also used for setting fire places on the wet grounds for cooking while the cooks covered their heads with wash basins against the rain. Post-disaster community coping mechanisms included the use of personal savings for purchasing necessary items e.g. food; the use of the flood waters for irrigation of green vegetables for sale; and, for the most vulnerable whose houses had been destroyed, sleeping under mango trees. Hence these coping mechanisms during and after the flood proved to be effective as there was no reported loss of human life. The positive effects of the flood on the community members included the use of flood water for irrigation; the flood bringing many fish/turtles for food; some of the streams that had previously been dried up being full of water for drinking; and the flood improved security in the area as community members could now sleep outside without any disturbance from intruders.

Finally, ten months after the flood incident, the community has not fully recovered. There is therefore still a dire need for humanitarian support, e.g. shelter, agricultural tools and other equipment, food for children, health services, and emergency preparedness – i.e. increasing the number of canoes in the location for subsequent flood disaster risk reduction. Furthermore, there is a need to strengthen community ability to respond; community early warning systems must be enhanced, awareness increased for communities living in a disaster-prone areas; and a community emergency response team established, trained and equipped.

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A female member of the research team introducing herself to the community at location 1 (Murkuku and Kujonok)  
(Photo credit: Patirik Nyombe)



Community members following the proceedings of the consultative meeting at Murkuku and Kujonok (Photo credit: Patirik Nyombe)



The research team sitting under mango trees upon arrival in location 1 (Murkuku and Kujonok) (Photo credit: Patirik Nyombe)



A community consultative meeting at Murkuku and Kujonok (showing the chief, centre, in red T-shirt) (Photo credit: Patirik Nyombe)



A community consultation meeting at location 2 ( Kango) (Photo credit: Angelo Wani Pitia)



One of the places on higher ground where the community members gathered for safety (Photo credit: Patirik Nyombe)



Some women showing how they cook using metal barrels, and the use of wash basins during the flood (Photo credit: Patirik Nyombe)



Some of the houses destroyed by the flood at location 2 ( Kango) (Photo credit: Angelo Wani Pitia)



One of the community members who lost his house to the flood (Photo credit: Patirik Nyombe)



The research team upon arrival at location 2 ( Kango) (Photo credit: Angelo Wani Pitia)

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# Uganda

## Traditional Knowledge Systems and the Conservation of Water Bodies and Aquatic Life in Uganda

Cross-Cultural Foundation of Uganda (CCFU)

Mr John De Coninck



Photo credit: The Cross-Cultural Foundation of Uganda

### Summary

Water bodies provide a source of livelihood to communities and a habitat for aquatic and amphibian animals and plants. More than 15% of Uganda's national territory consists of lakes, rivers and swamps. Besides livelihood, these water bodies provide other forms of value, such as healing at hot springs, ritual cleansing and traditional worship, and thereby help define the cultural identity of the communities concerned.

The sustainability of water bodies and related ecosystems has, over centuries, relied on the indigenous knowledge of these communities. Their elders, cultural and spiritual leaders, are the custodians and enforce adherence to relevant values, principles and practices. Such knowledge systems are, however, under threat as spaces for their transmission and usage have been compromised by formal education, non-indigenous religious orientations, land pressure due to population growth and economic activities, climate change, the transfer of the management responsibility for these water bodies from cultural leaders to government agencies, and the limited recognition of the former's role in the conservation of water bodies and ecosystems.

With the financial support of the UNESCO Regional Office for Eastern Africa, the Cross-Cultural Foundation of Uganda (CCFU)<sup>1</sup> conducted two combined case studies to ascertain the existence of indigenous knowledge systems relevant for the conservation of water bodies and aquatic life; to identify their contribution to the conservation of such ecosystems; to examine the threats they face; and to suggest ways of mitigating these threats.

In one case, the research explored the contribution of the 'Ssezibwa' tale and tradition of the Baganda to the conservation of the River Ssezibwa and the biodiversity it offers in Mukono and Buikwe Districts. The second case investigates the indigenous knowledge and cultural structures of the Alur related to fish-stock conservation on the River Nile and Lake Albert in Panyimur, Pakwach District.

The cases studied demonstrate the existence of indigenous knowledge which contributes to the conservation of water bodies and aquatic life. The Ssezibwa tradition deters communities from killing animals and cutting vegetation in and along the river. At the Ssezibwa Falls, the traditional worship and touristic functions coexist and foster respect for the environment. A major challenge, however, is on sustaining the cultural sanctity of the site while maintaining its touristic value. Pressure on land also threatens the environs and riverbanks with degradation.

In Panyimur, Alur culture designates sacred places where fishing is prohibited. These spaces serve as fish breeding grounds. Cultural leaders are traditionally assigned the role of enforcing adherence to rules that foster ecosystem sustainability, and it is believed that the spirits punish violators of these norms. These traditional arrangements are, however, threatened by the Uganda government's institution of non-traditional administrative mechanisms that seldom refer to indigenous knowledge; and are allegedly marred with corruption which abets malpractices, including overfishing using inappropriate fishing gear and methods. Additionally, today's multicultural population on the water bodies hardly understands and adheres to Alur traditions relevant to conservation.

<sup>1</sup> The Cross-Cultural Foundation of Uganda (CCFU) is a national non-governmental organization which promotes an appreciation of culture as vital for human development that responds to our diverse identities. CCFU is accredited to the 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage.



The study concludes that indigenous knowledge can work best when brought in conversation with scientifically informed approaches to conservation. The research, therefore, recommends devising ways of raising awareness of the existence and role of indigenous knowledge in the conservation of water bodies and biodiversity, such as through intergenerational and intercultural dialogues. Another recommendation is to foster collaboration between cultural and state leaders in implementing strategies, such as fishing holidays. The government of Uganda is also encouraged to enforce regulations concerned with the protection of riverbanks.

## Introduction: Indigenous knowledge, water bodies and biodiversity conservation

More than 15% of Uganda's national territory consists of water bodies: lakes, rivers and swamps, whose fauna and flora provide a source of livelihood for many communities. These water bodies also provide the communities concerned with other forms of value, such as healing at hot springs, ritual cleansing and traditional worship, and identity in relation to ancestral forms of livelihood.

Sustaining water bodies and ecosystems is therefore important for communities to continue accessing and enjoying the values they associate with them. Over centuries, the indigenous knowledge of communities neighbouring water bodies has thus informed the principles and practices of managing the biodiversity offered by these ecosystems. The meaning which these communities assign to weather and climatic change, physical spaces, land formations, certain animals and plants, and the water itself, also informs their sustainable use when carrying out activities like fishing, harvesting herbal medicine, cultivating and rearing animals. Some aspects of water bodies are deified through oral history and narratives, and the communities concerned work to maintain the sacredness and identity of these spaces. Fishing communities thus have principles and norms when relating to water, the violation of which, they believe, could lead to punishment for individuals or entire communities with, for example, calamities like storms and floods. Traditional leadership structures and mechanisms accompany these indigenous knowledge systems. Cultural and spiritual leaders play an important role in ensuring that the norms are adhered to, and elders and parents are tasked to transmit this knowledge across generations.

Such knowledge systems are, however, currently under threat as spaces for their transmission and usage have been greatly compromised by formal education, non-indigenous religious orientations such as Christianity and Islam, population growth, climate change, and the drive for quick profits, including through destructive forms of industrial fishing. Further, the disregard of traditional values and principles in the utilization of water resources is now blamed for the rapid depletion of resources, particularly fish, as some would-be protectors of these resources have been found allowing the use of inappropriate fishing gears and methods. A study conducted by Nunan et al. (2018) around the shores of Lake Victoria found that 'corruption is systemic and that members of all stakeholder groups – fishers, fisheries officers, police and the judiciary – are implicated' (p.59).

Today in Uganda, the management of water bodies and associated ecosystems in Uganda has increasingly been taken over by government agencies such as fisheries departments, the marine police and the National Environment Management Authority (NEMA), implementing national-level policies. Although the statutory management of water resources is changing compared to colonial times, when nature and human culture were viewed as separate and conflicting with regard to access,

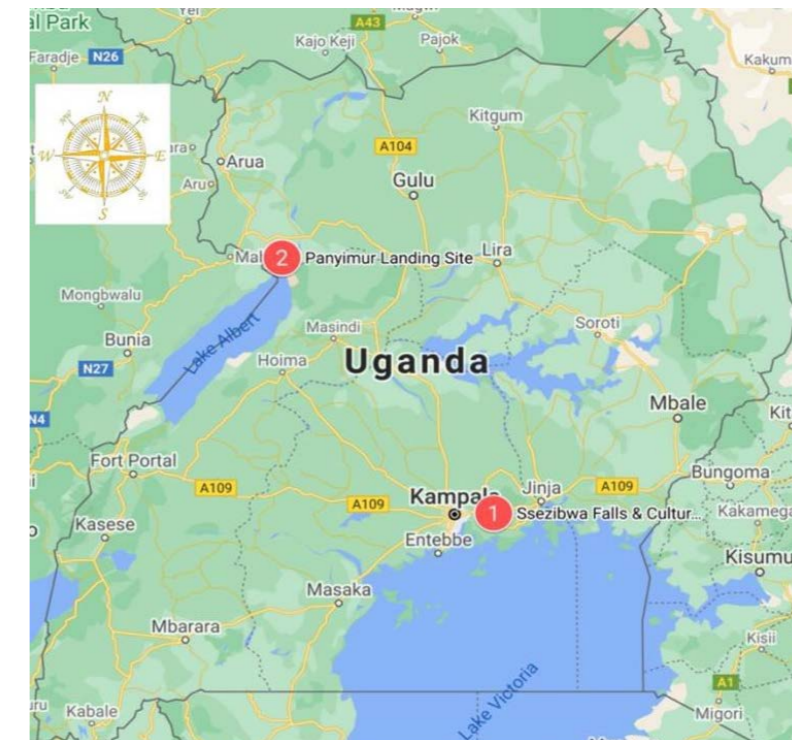
ownership and utilization of resources (Drani, 2016), the recognition of the value of indigenous knowledge is still wanting.

The role of indigenous knowledge in the conservation of water bodies and aquatic biodiversity, particularly in the Ugandan context, has indeed received little research attention. Its potential is not therefore fully utilized and there is a risk of losing this important knowledge. The research described in these pages attempts to address this gap through two case studies.

## The research

### Focus, cases and approach

With the support of the UNESCO Regional Office for Eastern Africa, the Cross-Cultural Foundation of Uganda (CCFU) conducted two combined case studies to examine the existence and role of indigenous knowledge in the conservation of water bodies and ecosystems in two selected locations in Uganda.



Map of Uganda showing the research  
Photo credit: National Geographic Society

Specifically, the study set out to identify:

- Indigenous knowledge systems that support the conservation of water bodies and aquatic life
- Aspects of indigenous knowledge that influence human action on, and interact with, the water bodies and aquatic life
- The threats, if any, to the continued influence of indigenous knowledge on practice
- Possible approaches and actions that can sustain the role of IK in aquatic biodiversity conservation at the two research sites.

The research mainly draws on the indigenous knowledge of two cultural communities: the Baganda in Central Uganda and the Alur in the north-western part of the country. The first case focuses on the role of the cultural values associated with the 'Ssezibwa' tale and tradition of the Baganda in conserving

River Ssezibwa and the biodiversity along its banks in Mukono and Buikwe Districts, especially at the Ssezibwa Falls Cultural Heritage Site in Mukono. The second case investigates the indigenous knowledge and cultural structures related to fish-stock conservation on the River Nile and Lake Albert in Panyimur, Pakwach district.

The research started with a review of literature on conservation knowledge, policies and practices in Uganda. This was followed by fieldwork in the two study areas. Interviews were conducted with individual stakeholders and focus groups.

In Panyimur, the categories of participants included cultural and spiritual leaders, elders, fishermen, women, the marine police, seashell miners, and leaders from the local government and from the fisheries department. In Ssezibwa, the participants included spiritual leaders, the management and tour guides at the Ssezibwa Falls resort, and elders.

At both sites observation was a key strategy for ascertaining the existence of people's skills and practices, and the use equipment, such as fishing gear, as well as the local fauna and landscapes. Video and photographic information was captured, with the consent of the participants.

### **Strengths of the case studies: representativeness and uniqueness**

The strength of this research initiative lies primarily in the selection of the cases and in the approach employed. The two cases on the one hand represent two main categories of water bodies in Uganda (lakes and rivers) and, on the other hand, are unique in terms of their respective narratives and belief systems which influence human activity, and thereby contribute to water-body and aquatic-life conservation.

The story and tradition of Ssezibwa as a deity, river and twin presents a strong combination of a traditional belief linked to an aspect of nature and a direct connection to the human world.

The research area of Panyimur provides a combination of a river and a lake, since it is where the River Nile departs from Lake Albert. Part of the area, the Dei landing site and fish market, lies at the border between Uganda and the Democratic Republic of Congo, where people from each country mix with each other and share fishing practices. This, therefore, represents the experience of how indigenous knowledge fares in a multicultural environment.

The primary data were collected from the key stakeholders described above, and its interpretation while in the field was aided by community-based resource persons. Alongside the CCFU staff, two Makerere University undergraduate students who come from the Baganda and Alur cultural communities respectively also participated. They were introduced to community-based research, while contributing insights from both the researchers' and community members' perspectives. They also helped to translate and interpret, thereby increasing the accuracy with which the participants' ideas and reflections were noted.

### **Limitations of the study**

This study was conducted over a short period of time, with limited financial resources. Apart from four days during which pre-visits were made to select the sites, only eight days were distributed between the two sites: five in Panyimur and three at Ssezibwa. An ethnographic, longitudinal study might have

been more appropriate to foster a more in-depth understanding of indigenous knowledge and its application to water resources conservation. The work, especially in Panyimur, however, builds on an earlier study conducted by CCFU in 2010, examining how fish-stock conservation is supported by cultural and traditional leaders alongside other administrators of the water body.

## **Conservation and indigenous knowledge related to Ssezibwa**

The oral tradition of the Baganda has it that the River Ssezibwa was born as a twin with the River Mubeeya to two ancestors – Nsubuga Ssebawato Twaliranyamayumba and his wife, Nakangu Tibateesa. The story goes that when Nakangu felt labour pains, her energy failed, she knelt down and delivered only water. A few days later, two rivers emerged in a nearby valley. Her husband subsequently received visions from spiritual beings, identifying themselves as his children Ssezibwa and Mubeeya, manifested in the rivers we see today flowing into Lakes Kyoga and Victoria, respectively. The Ssezibwa Falls in Kayanja are considered to be Ssezibwa's home, while Mubeeya's is at Wankwale in Buikwe District.

### **The value of indigenous knowledge related to Ssezibwa**

The Baganda revere Ssezibwa and Mubeeya as deities, rivers, and twins; each with identities related to a set of cultural norms and practices relevant to the conservation of the local water bodies and biodiversity.

#### **Biodiversity at the Ssezibwa Falls cultural heritage site (in the Luganda language)**

- **Plants:** *entaseesa, enkuzannyana, ejjirikiti, ekifabakazi, emituba, emyoolola, enkalati, empewere, kamenyambazzi, akasaana, emiyembe, etc.*
- **Birds:** *eng'aang'a, obusanke, amaffulungu, endegeya (weaverbirds) sosolye, emijjonkezi, nantayi, konkonamuti, etc.*
- **Animals:** *a python (said to be a deity called Magobwe), enkima, engabi, namunungu, bushbucks, empeewo, tortoises, etc.*
- **Fish:** *emmale, omulende, engege*

#### **Ssezibwa as a river and physical space**

River Ssezibwa provides water for domestic and commercial use, which sustains human life. It is also home to a diversity of plants and animals, both land- and water-based. The place also serves as a tourism site. Some spaces at the river are reserved for quiet meditation. Many dignitaries, especially from the local Kingdom of Buganda, visit the place and plant memorial trees which are then revered by the caretakers and users of the site. The Buganda King Mwanga, who visited in 1884, for instance, planted a tree which still stands to date. Other trees were more recently planted by King Ronald Muwenda Mutebi II and other notable visitors. The caretakers of the place regret that the tree which was planted by King Kabalega of Bunyoro, who had visited Buganda, was cut by someone unknown to them.

#### **Ssezibwa as a deity**

As deities, Ssezibwa and Mubeeya are said to work miracles for people who seek their help, such as blessings in work, health and longevity of life. Ssezibwa works with other deities whose shrines can be seen at the Ssezibwa Falls. Some of these deities manifest themselves

in the form of animals, such as Magobwe, a python said to live in a stone cave. Sacrifices such as eggs, roasted coffee, and local beer are served to this deity at the entrance of the cave.

All animals and fish at the site and along the river are considered Ssezibwa's children and are conserved for their spiritual and totemic value. They are therefore not supposed to be killed. Fish, especially the mmamba (lung fish) which is Ssezibwa's totem, and the ekibe (fox), which is his mother Nakangu's totem, are especially kept as sacred. Elder Joseph Kalanzi, a retired Ssezibwa tour guide, states that if anyone is to fish in the river, one has to ask the deity for permission, lest they encounter problems. Even when sacrificing, the spiritual leaders instruct that blood must not be spilled on the site, except if one is preparing a meal. These leaders explain that, since Ssezibwa's help is requested when one is alive, any thanksgiving should also be of live animals. The sacrificial animals are thus presented alive, let to step into the water and then to disappear into the wilderness.

Sanctions can be severe for an individual who violates norms, especially by cutting trees along the river, which are said to be the houses of a deity called Nakalanga. They should therefore not be cut unless one 'builds' others for him by planting more trees. Mumbejja Prossy Nassiwa, a traditional priestess at the Falls, says that she normally receives warnings from many of the deities, against destroying nature.

*Sometimes the [dieties] appear to me and ask me many questions. One once told me, the more you people destroy my houses, the more you will bear children that have heads as big as mine<sup>2</sup>. And we see that today. People are bearing children with big heads as deformities.*

Further, according to the spiritual leaders and tour guides, the site is only a place for prayer and not for harvesting medicinal plants or animals. Rather, traditional healers use the plants in the space to guide their clients on what they should harvest in other places, thus helping to conserve the local vegetation.

### **Ssezibwa as a twin**

The culture of the Baganda prohibits the angering of twins such as Ssezibwa and Mubeeya; this contributes to the community's adherence to their demands related to proper management and sustainable utilization of the water bodies, animals and plants. Mr Luutu who takes care of Ssezibwa's shrine says:

*Anyone doing a wrong thing to Ssezibwa or Mubeeya is punished unless he or she apologizes to them. One of the major roles I play here is to help people when they are settling issues with the twins. You know what twins can do in Buganda. They can burn you, make you crippled or even kill you. Sometimes the punishment comes to future generations in your family. We have helped people who are being punished because their grandparents did the wrong things.*

The fear of twins thus also serves to instil respect, compelling people to adhere to the values associated with the Ssezibwa tradition.

<sup>2</sup> The Baganda imagine the deity Nakalanga as one with a big head. Bearing a child with macrocephaly or hydrocephalus is said to be a punishment from this deity.

## **Challenges to the role of indigenous knowledge in biodiversity conservation at Ssezibwa**

The contribution of the Ssezibwa narrative and tradition to biodiversity conservation is threatened by challenges related to their transmission, to sustaining the cultural integrity of the place while maintaining its touristic value, by the drive for economic gain, and by the overutilization of the nearby land and water resources.

The first challenge pertains to the transmission of the knowledge and value of Ssezibwa to the current and future generations. Among the Baganda, cultural values and principles are orally transmitted at fireplaces and other traditional settings such as places of worship, hunting grounds and in forests during firewood collection. Specific individuals are normally assigned by tradition to transmit certain forms of knowledge to the young generation. Maternal uncles educate boys while paternal aunts educate girls. Spiritual leaders are also charged with guiding the community on certain aspects pertaining to their roles, such as how and when to worship or sacrifice. The narrative and values related to Ssezibwa are also transmitted at such fora.

The transmission of indigenous knowledge related to the Ssezibwa narrative and tradition has, however, been negatively impacted by formal education which takes children to school for most of the day almost all year long, by the increasingly busy world of work which reduces parents' interaction with their children, by the shrinking family size – from extended to nuclear – especially in urban and peri-urban places such as Mukono where the Ssezibwa Falls are located, and by the increasing adherence to non-traditional religions. Spaces like fireplaces have been replaced by 'modern' information and entertainment focal points, such as televisions and radios.

As a result, the knowledge related to Ssezibwa today is held mostly by elders, spiritual leaders, tour guides and only a few members of the community who have cared to learn about it. Youth who come to visit the site are informed by the tour guide, but this is limited to irregular and usually one-off interactions.

The second challenge relates to balancing Ssezibwa's cultural sanctity and touristic value. People go to the Falls either to worship or to tour. Whereas traditional worshippers should ideally adhere to the conservation principles informed by indigenous knowledge, some revellers coming to tour the site disregard them, even after being informed by the tour guides. This, according to the spiritual leaders, desecrates the site and compromises its cultural significance. Over time, this could undermine the narrative that has hitherto supported the conservation of the water body and the life it sustains.

The third challenge relates to addressing economic gain as a major driver for the pressure on land surrounding Ssezibwa Falls and along the banks of the river. Sugarcane growing is the major activity near the falls; this has led to massive deforestation and resulted in the disappearance of some of the animals that lived in the bushes, as observed by Mumbejja Prossy Nassiwa, who started her traditional priesthood work at the site in 1997. She fears that all the forests may eventually be cut down, which will adversely affect the entire ecosystem. Along the river, away from the falls, land pressure has resulted in the cultivation of land up to the banks. This has displaced some of the animals that depend on both land and water resources, such as tortoises.

The case of Ssezibwa demonstrates that indigenous knowledge can contribute to the conservation of natural resources, in this particular case water bodies and aquatic life. The contribution made by

traditional worship practitioners and managers of cultural sites is particularly important for sustaining the values and principles relevant to their sustainability. The threats to the survival of Ssezibwa's narrative and its contribution to aquatic-life conservation need to be addressed with interventions that would raise awareness, repair the damage that might have been caused (for example by deforestation and cultivation along riverbanks), and by implementing environmental protection regulations, both traditional and statutory.

## Indigenous knowledge and fish-stock conservation in Panyimur

Panyimur consists of a stretch of fish landing sites on the north-eastern part of Lake Albert, where the River Nile departs north-eastwards on its journey to South Sudan. Although the fishing activities in Panyimur are increasingly undertaken by people from various ethnic groups, they have for long been the prerogative of the Jonam<sup>3</sup>, a sub-community of the Alur people, on both sides of Uganda's western border and on the eastern border of the Democratic Republic of Congo (DRC).

### The value of indigenous knowledge to water body and aquatic-life conservation in Panyimur

Traditionally, the indigenous knowledge and cultural administrative structures of the Alur inform the community's understanding of the water bodies and aquatic life. This indigenous knowledge is reflected in a set of norms, beliefs and taboos that have a strong bearing on the preservation of the water bodies and on the lives of humans, animals and plants. These norms prescribe acceptable behaviour in conducting fishing activities and assign various roles relating to maintaining aspects of the fisherfolk's life to traditional leaders. Punitive and restorative justice procedures are used when norms and principles are contravened. For example, fighting on the lake, fishing in sacred spaces and catching very young fish is punished with either fines (such as goats) imposed by humans, or by spiritual beings (such as wira, ocungoryaka and kilima<sup>4</sup>) which are believed to cause calamities like drought and heavy windstorms.

The traditional role of enforcing adherence to fishing norms and principles is the responsibility of the Chief (Rwot), working through an administrative structure with, notably, a head fisherman (Jadit dwar), a security leader (Jago) and a spiritual leader (Jalam). The head fisherman is supposed to disseminate information on good practice among the fishermen, and report to the Chief any violations of acceptable fishing practices. The security leader is also charged with patrolling the fishing sites and the lake to identify and address or report any violations of the established norms. The spiritual leaders also curse any wrongdoers who do not publicly confess their misdeeds and bless those who behave well on the lake.

Culture also charges head fishermen with the role of leading fishermen's councils which are supposed to check the behaviour of their colleagues and prescribe punishments such as banishing fishermen who repeatedly violate fishing principles. The council members should be selected according to the length of time they have spent working at the landing site. Strangers are supposed to be introduced to the Chief and his officials who then orient them to acceptable behaviour and values. The spiritual

3 Jonam translates as '[people] of the water body', referring to the people living near Lake Albert and River Nile

4 Wira is said to be an animal which raises its tail towards the sky and brings it back, causing a windstorm on the lake. Ocungoryaka is said to be half human when seen, as reported by some fishermen. Kilima is a mermaid-like creature that teases and often causes harm to fishermen who disrespect established norms, or to their families.

leaders perform an intermediary role between humans and the spiritual world. They are ultimately responsible for maintaining the sanctity of the sacred places on the lake, which also serve as breeding grounds for fish and other animals.

The Alur have, in the past, designated special spaces on Lake Albert and along the River Nile as sacred sites (wang-jok) to which only the responsible spiritual leader could go to supplicate ancestors and spirits in case of calamities or communal requests. Such places were normally overgrown bushes and trees. All fishermen knew these spaces and would not dare to enter for fear that the spirits would either instantly punish them by drowning or would bring calamity to the entire community. Most of these sites no longer exist, but a few, such as Kabindi Omwona, Wang-Nyilak and Wang-Nyawino, are still functional. Some trees on the riverbanks are also preserved because they are believed to belong to the spirits and ancestors.

### Biodiversity at the Ssezibwa Falls cultural heritage site (some in the Alur language)

- **Animals:** Crocodiles, hippopotami, ngech, ger (tortoise), octopus, snakes, pythons, opal, nyakazibi
- **Fish:** Aporo, angara, nangnang, Nile perch, tilapia, electric fish, wasoni, ngungu, nganya/wagesa, olose, lakgol, olike, adinga, onjele, mbalwa, wasoni
- **Plants:** mukasa, aburao, water hyacinth
- **Birds:** soya, marabou stock

In Alur culture, catching young fish was considered abominable. Such fish were said to curse fishermen and cause harm to them – such as facing a heavy storm and strong waves while on the lake. Rather, when one caught small fish, it should be quickly returned to the water. To facilitate catching fish of an appropriate size, the Alur would use traditional fishing gear: these included pok kalanga canoes that would move silently on the water (unlike boat engines), makonge (sisal nets with wide holes), mugaja (baskets woven with ongalo plants), ndeya (spears for catching fish in muddy areas) and hooks.

### The situation today, and challenges to the role of indigenous knowledge systems in fish-stock conservation in Panyimur

Today, the role of indigenous knowledge in the management and sustenance of the lake and the ecosystem is threatened by various factors, including challenges related to the governance of the lake, the understanding and adherence to traditional fishing norms and principles, and excessive harvesting of water resources, including fish, to meet growing economic demands.

Alur elders trace the reduction in the powers of the cultural leaders to the 1966 abolition of traditional and cultural institutions in the country. These elders say that, even with the restoration of these institutions in Uganda in 1993, some of their influence has not returned. The governance of the water resources has, over time, indeed changed hands from the traditional system to the government-instituted Fisheries Department, the Marine Police, and to Beach Management Units (BMUs), which have now evolved into Landing-Site Committees, consisting of the Chairperson of the Local Council, a representative of the fishermen and the Chairperson of the committee itself. Traditional leaders, like the Chief or his nominees, are, however, co-opted on some administrative committees or consulted on certain governance issues.

The spiritual leader is almost always invited to solve problems that are considered to require divine intervention. In Panyimur, the government-instituted administrative units have often been accused of corruptly allowing the use of inappropriate fishing gear and methods. Chief Charles Ombidi III of Ker Kwonga Panyimur says:

*... they appointed ... only three people, and you find that these people are bribed in the process of election.*

*... thieves also enter in their way: the illegal fishing gears. Is there any control?*

The mixed ethnic composition of the fishing population also translates into a diminished understanding and adherence to the established norms and a reduced allegiance to the cultural administrative structures. Although Panyimur today is still dominated by the Alur, there is a sizeable number of people from other cultures, such as the neighbouring Lugbara, Ma'adi, Acholi, Kebu, Lendu and Palwo, as well as immigrants from the DRC. In this multicultural context, indigenous knowledge awareness and subscription is greatly reduced, and the authority and guidance of cultural and spiritual leaders is often disregarded. Non-traditional religious beliefs such as Christianity and Islam have added to this challenge; for example, some religious leaders are said to spearhead the cutting of bushes in sacred sites, and thereby expose the fish-breeding spaces to abuse.

The disregard of traditional fishing norms and principles is increasingly threatening the existence of some species of fish, such as aporo (star fish), wasoni, angara and ngugu. The local communities blame the impending extinction of these species on poor fishing methods, such as the use of small gill nets (kokota) that catch young and old fish indiscriminately, monofilament poisonous nets which kill all the fish and other animals that come into contact with them, lights that go too deep into the water, and the tenga technique where fish are scared from their breeding habitat by loudly banging a tin tied on a long stick in the water. As a consequence, fish catches have reduced. A Fisheries Officer in Panyimur noted that Fish Movement Permit revenue collections have reduced from Ugandan Shillings 800,000 - 1,000,000 to 200,000 - 450,000 per week over the past five years or so.

Widespread sand mining and snail-shell harvesting, especially in the Angumu and Munywa areas in Panyimur, present other threats to biodiversity conservation. Lake sand is used in building construction and snail shells are used as feed for animals, such as poultry and pigs. One of the sea-shell miners noted that their harvest has significantly reduced over the fifteen years he has been working at the sites.

Climate change also has an effect: rising water levels have had a significant impact on the implementation of some aspects of indigenous knowledge and practices. For example, some breeding areas have been submerged, and the local population does not know whether and where the fish are breeding anymore. The rising waters have also been used to justify some poor fishing methods, such as the use of lights that go too deep into the water, which is said to result in overfishing.

Finally, some aquatic animals are hunted for non-food use, which leads to their depletion. For example, an animal locally called nyakazibi is said to have medicinal value and its skin is used for ornaments and dancing gear. Whereas traditionally cultural and spiritual leaders would restrain people from hunting to depletion, the current context has weakened their voice and influence in this regard too, resulting in these animals facing extinction.

## Reflections, conclusions and recommendations

The current study aimed at using the cases of Ssezibwa and Panyimur to: ascertain the existence of indigenous knowledge systems relevant for the conservation of water bodies and aquatic life; to isolate the aspects of these systems that influence pro-conservation human action and interaction with the water resources; to identify the threats to the contribution of indigenous knowledge to aquatic-ecosystems conservation; and to suggest some ways of sustaining the contribution of indigenous knowledge to conservation.

Overall, the research findings suggest that indigenous communities have traditional knowledge systems that are relevant to the conservation of water bodies and aquatic life. Such knowledge systems influence how humans act on and interact with these water bodies and the animals and plants therein.

The indigenous knowledge related to biodiversity conservation is, however, threatened by various factors, mostly relating to insufficiencies in knowledge transmission, the administration of the water bodies by state authorities, and the drive for economic gains which results in the unsustainable use of natural resources, in disregard of traditional values and principles.

Addressing the threats to the survival of conservation-related indigenous knowledge requires the recognition of its role by state and non-state actors, and the devising of ways to incorporate aspects of indigenous knowledge in the development agenda (Warren, 1992). Article 8(j) of the 1992 Convention on Biological Diversity places, on the States Party, the responsibility to:

*... respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.*

It is important, therefore, to rejuvenate and sustain the role of indigenous knowledge in the conservation of water bodies and aquatic life. The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, No. 3/2000 (NEMA, 2000) thus recognize the role of communities in supporting the conservation of some water bodies by, for example, suggesting in Article 8.2(c) that a wetland can be designated as protected by the neighbouring community, which the same document defines as 'an assemblage of human beings living in a defined geographical area and identified by common history, common culture or common residence in an area'. The said community can therefore be seen to share a body of indigenous knowledge which can be applied for conservation purposes. This is consistent with the spirit of international legislation, such as the 1992 UN Convention on Biological Diversity and the 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage.

The cases studied reveal gaps in the collaboration of cultural and statutorily mandated leaders. In Panyimur, for example, cultural leaders are disgruntled, arguing that they are insufficiently represented on the landing-site committees, although they are sometimes invited to share ideas when decisions are made. Such an invitation is not sufficient to harness the full potential of indigenous knowledge.

A key recommendation from the research, therefore, is to strengthen the involvement of cultural leaders in the administration of water bodies.

Further, today, the bearers of indigenous knowledge, especially elders, are being replaced with young people in places of influence. Some government workers are posted with little or no understanding of the local knowledge systems; and immigrants normally come to landing sites with little recognition or respect for the values and principles of the host community. Friction between belief systems, especially between modern religions such as between Christianity and traditional African beliefs, adds not only to information gaps but also generates active counteractions. The research, therefore, suggests that spaces for indigenous knowledge transmission through intergenerational and intercultural dialogues be created.

The cultivation and eventual degradation of riverbanks was highlighted by the community members as an issue to address. In Ssezibwa, sugarcane and other crops are grown sometimes up to the water edge. Animal keeping and industrial work also degrade the River Nile. Legislatively, both Rivers Ssezibwa and the Nile appear in the sixth schedule of the National Environment (Wetlands; Riverbanks and Lake Shores Management) Regulations, 2000, which stipulates that these rivers should have a protection zone of at least one hundred metres from the highest watermark. Other rivers not appearing on the schedule mandatorily have a protection zone of thirty metres from the highest watermark. Riverbank protection zones have been identified as an effective strategy for 'flooding control, water protection, soil conservation, habitat provision for wild species diversity, and the influence they have on ecosystem processes in wetlands' (Ma, 2016, p.1). The recommendation here, therefore, is to enforce this regulation so that the banks of the rivers are not degraded.

The research participants in Panyimur suggested other ways of supporting the regeneration of fish and other animals from Lake Albert and the River Nile. Fishing holidays enforced by both cultural and statutory leaders were thus proposed.

Finally, a key reflection from this research is that while indigenous knowledge is, as ever, relevant to the conservation of water bodies and aquatic life, such knowledge is unlikely to be sufficient to sustain water bodies if applied in isolation. Discussions on the dichotomy between indigenous and modern approaches to conservation have mostly been directed to including indigenous knowledge where modern knowledge is invested (Kidd, 2016). It can be argued that this should apply in both directions: indigenous knowledge cannot sufficiently address conservation challenges in the current development contexts. Indigenous knowledge relies mostly on narratives with a spiritual connotation which, if not sufficiently understood by other development actors, may be resisted or dismissed as obsolete. Bringing indigenous knowledge in conversation together with scientific understanding of the universe would support and strengthen the usage of both knowledge bases.

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Mr. Alex Luutu, the traditional priest, kneels before the stone marking the spot where Ssezibwa is said to have been born  
Photo credit: The Cross-Cultural Foundation of Uganda



A comparison of recommended and inappropriate fishing nets  
Photo credit: The Cross-Cultural Foundation of Uganda



Sand and seashell mining in Angumu, Panyimur  
Photo credit: The Cross-Cultural Foundation of Uganda



Sand and seashell mining in Angumu, Panyimur  
Photo credit: The Cross-Cultural Foundation of Uganda



Tourists visiting Ssezibwa Falls  
Photo credit: The Cross-Cultural Foundation of Uganda



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