



CULTURAL HERITAGE

Preserving Ethnomedicinal Knowledge through
Indigenous Ecotourism

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INTRODUCTION

As more parts of the world become developed and modernized, its bio and cultural diversity is becoming increasingly threatened. Areas that are high in one tend to be high in the other also, and as the world becomes less biologically diverse, it becomes less culturally diverse as well ([Gorenflo et al, 2012](#)). The two concepts are inextricably linked, so as biodiversity is increasingly protected, it is critical to ensure the protection of an area's culture and traditions too, so that current and upcoming generations can continue to learn from them, while keeping them alive. If not, this undocumented knowledge could be lost forever, a few short generations in the future. This knowledge is useful for recording local history, educating youth and decision makers, understanding land and resource management, and revitalizing indigenous cultures ([Berkes, 2008](#)). Sharing and conservation of knowledge and traditions has enabled the human race to make great strides in progress, but there is still much to be learned. With more of the world adopting modern practices each day, the survival of indigenous cultures needs to be a priority.

Ecotourism is becoming an increasingly popular market in Tanzania, having grown 630% from 1990-2013 ([Mgonja et al, 2015](#)). It is popular in areas that are high in biodiversity, because it typically minimizes impacts on the environment ([Higham & Lück, 2007](#)). In fact, by popular definition, ecotourism; 1. Protects natural + cultural resources, 2. Provides Learning opportunities, and 3. Adheres to ecological, sociocultural, and economic sustainability principles ([TIES, 2015](#)). When combined with social benefits, it can also be a useful tool for sustainable development ([Charnley, 2005](#)), as well as the protection of cultural heritage. It therefore has the potential to be used as a means for both biodiversity conservation and cultural survival, simultaneously.

The challenge then is to create a solution that promotes cultural preservation, through ecotourism. This needs to be done in a way that brings in visitors with the promise of education and exposure to authentic cultural experiences, while drawing from traditional knowledge and involving locals in every step of the process. Doing so can help to preserve and revitalize cultural heritage, while providing visitors with a unique and enriching experience that compliments other ecotourism activities being pursued in rural Tanzania.

BACKGROUND

A Need for Cultural Preservation

As the world undergoes rapid social changes, many practices and social relations are fractured on a local level as a consequence, creating a need to record and preserve cultural knowledge ([Nabhan, 2000](#)). This cultural preservation can take many forms, including the preservation of language, traditional practices, history, and Traditional Ecological Knowledge (TEK). Relevant when discussing areas high in biodiversity, [Berkes \(2008\)](#) defines TEK as;

“A cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.”

A component of TEK is a culture’s collective knowledge of plants, which is connected with people’s understandings and relationships with the environment, encompassing practices and beliefs as well ([Berkes, 2008](#)). Some of these practices and beliefs are centered on a culture’s relationship with the medicinal qualities of these plants. Ethnomedicinal knowledge is an even more specific sub-component of TEK, and contains a lot of valuable information that is beneficial for not only communities, but the whole world. It is through ethnomedicinal knowledge that effective treatments for malaria and cancer have been discovered, helping countless people worldwide ([Smith & Wright, 2001](#)). Ethnobotanists are currently concerned with the threat to traditional cultures and their knowledge of plant use and relationships ([Ramirez, 2007](#)). This is a very reasonable concern, because if this knowledge isn’t preserved, the understanding of the healing potential of thousands of plants for countless people will be lost indefinitely.

Indigenous Ecotourism

As ecotourism and wellness tourism become more popular, there has been a growing interest in engaging in experiences with indigenous people ([Charnley, 2005](#); [Hinch, 1998](#)). Many of these experiences involve immersion into another culture, or direct experience with traditional cultural practices ([Davidov, 2013](#)). By creating tourism experiences that focus on the traditional practices of indigenous people, ecotourism is being used as a tool for cultural heritage. [Butler and Hinch \(2007\)](#) identify indigenous tourism as;

“Tourism activity in which indigenous people are directly involved either through control and/or by having their culture serve as the essence of the attraction”.

Many indigenous people use ecotourism as a way of sustaining their culture, and are therefore taking on more roles in such ventures ([Zeppel, 2006](#)). For these ventures to be successful, the power must shift away from private institutions and NGOs to communities, as small-scale business owners are better able to represent the interest of indigenous cultures and communities ([Aghazamani & Hunt, 2017](#); [Coria & Calfucura, 2012](#)). It can also be used as a conservation tool, by aligning environmental initiatives with

local livelihoods ([Kiss, 2004](#)). As was mentioned earlier, ecotourism frequently occurs in areas that are high in biodiversity, and when indigenous communities directly benefit from this biodiversity, they will be more inclined to protect it ([Coria & Calfucura, 2012](#); Highman & Lück, 2007).

Aligning with trends in health and wellness tourism, tourists traveling to Ecuador often seek to engage in indigenous experiences with ayahuasca, a drink prepared from a mixture of psychotropic vines, which is known to alter the user's consciousness and produce hallucinogenic experiences, possibly sought out of interest in the indigenous naturopathic healing traditions, or out of interest in entheogenic experiences ([Davidov, 2013](#)). Ancient traditions are becoming more of an attraction for tourists, and many are prepared to travel long distances to experience indigenous healing and natural products ([Hannam, 2009](#)). This is partially a result of a decline in traditional religion and lack of faith in conventional medicine, resulting in more people seeking out new-age therapies ([Hannam, 2009](#)). Creating an indigenous tourism experience that is focused on health and wellness, while enriching the experience with local ethnomedicinal knowledge, creates an undeniably large appeal for potential visitors.

Local Context

Development

As Tanzania works more each year to develop its parks and protected areas, sacrifices are being made, often in and around the villages adjacent to these parks. In the villages surrounding Udzungwa Mountains National Park (UMNP), some of these sacrifices have manifested in the form of a loss of old, indigenous culture. The creation of the park, the ujamaa villagization movement in the 70s, along with the establishment of the Illovo sugar company, has brought many immigrants into the communities, and with them, more cultural diversity ([Kikula et al, 2003](#)). While immigration is not inherently bad, it can have the unwanted consequence of loosening social ties among community members. The modernization of villages has had a similar effect, with progress weakening the attachment that people have to their social environment in addition to the natural environment, as well as their sense of belonging ([Agrawal & Gibson, 1999](#)). Development, no matter how well intentioned, will almost always come with such side-effects.

Loss of TEK and Ethnomedicinal Knowledge

One such side effect is the loss of TEK in the communities around UMNP. With the land use rules associated with UMNP's protected status, villagers are restricted from visiting park lands to collect medicinal plants and other resources ([Nyundo et al, 2006](#)). Around the park, local people have long maintained their livelihoods by using the resources found in the mountains, and these new restrictions created a need for adjustment. Preserving the TEK of the people around the park is important, because as more people turn to modern commodities and medicines while relying on the resources of the land less, this knowledge could be completely obsolete in a few generations. If some of a person's culture is lost, part of a person's identity can be lost with it, and the whole community suffers. With restrictions in place on resource collection within UMNP, and the cultural heterogeneity brought about with the increasing population, the TEK of traditional healers specifically their ethnomedicinal knowledge, is currently at risk of being lost.

With there being a number of traditional healers operating in the region around the Udzungwa Mountains, it is clear that there is a vast ethnomedicinal knowledge in the area of the plants, which could be translated into an educational experience for visitors. UMNP has over 160 medicinal plant species, and it is estimated that there are more than 100 traditional practitioners that visited the park in the recent past to collect these medicines ([Nyundo et al, 2006](#)). Since the park has increased their restrictions on resource use, there is a need for other sources of these medicines that are available for communities. Harrison ([2006](#)) points out that community developed woodlots that are properly managed can allow for the local harvesting of medicines, in addition to other commonly used resources. Sometimes, traditional healers need to travel to other villages to acquire the plants they need for their practices, and having a community run medicinal garden would make the acquisition of these resources much easier (Personal Observation, 5/30/2018). There are a number of different tribal cultures represented in these villages, and traditional healers from these different cultures each have their own unique practices. There are also healers who have migrated to the area to conduct their practices, adding to the heterogeneity.

Implementing Indigenous Ecotourism

Acknowledging the number of traditional healers operating in communities around UMNP and the expansive collective ethnomedicinal knowledge they possess, this area would be ideal for an indigenous wellness and cultural tourism experience. There is also a need for indigenous tourism in the UMNP area, because currently most of the operations are run by the Tanzania National Parks Authority (TANAPA), or by foreign investors, and few engage visitors with the local culture. An indigenous tourism operation that is focused around the ethnomedicinal knowledge in the area would empower locals, preserve culture, and promote responsible stewardship of the environment.

PRECEDENTS IN WELLNESS, ETHNOMEDICINAL, AND INDIGENOUS TOURISM

Indigenous Ecotourism in Tanzania

Nogutu Village – Uluguru Mountains

Located near the town of Morogoro, tourists have the opportunity to experience the local culture and livelihoods of Luguru people in multiple villages within the mountains. Supported by the Mountains Conservation Society of Tanzania (MCST), tours offer visitors exposure to daily activities such as mat, chair, and brick making, while also learning about local food and dance traditions. They are also taken on a hike through the mountains to the village of Madola, where they can learn about their wooden crafts and meet with a local witch doctor, who has a vast ethnomedicinal knowledge of the area. The program protects indigenous culture while promoting the conservation of the forest, and profits are distributed among various local groups, with 10% going back into watershed restoration.



Mountains adjacent to Morogoro

Source: ([Zeppel, 2006](#))

TAKEAWAYS

- **Visitors experience local culture & livelihoods**
 - **Protects indigenous culture**
 - **Promotes forest conservation**

Ethnobotanical Gardens

Oaxaca Ethnobotanical Garden – Oaxaca, Mexico

The Oaxaca ethnobotanical garden was started in 1994 by Maestro Francis Toledo after the Mexican military vacated the former convent of Santo Domingo in downtown Oaxaca. The space used to serve as barracks from the mid-nineteenth century, and before that it was occupied by Dominican Friars in the 16th and 17th centuries. Much of the design of the garden and layout of plant species is meant to reflect the area’s history and culture.



Dentro del Jardín

1. Entrada
2. Salón Orquídeas
3. Taquilla
4. Biblioteca
5. Sanitarios Damas
6. Sanitarios Caballeros
7. Oficinas administrativas
8. Cubo de escalera
9. Farmacia
10. Sanitarios
11. Atrio

Atractivos Sobresalientes

- A. Escultura de Jorge Dubón
- B. Escultura de Luis Zárate: Espejo de Cuauana
- C. Escultura de Jorge Viaspik
- D. Invernadero
- E. Calzada antigua
- F. Estanque arqueológico siglo XVI
- G. Hornos de cerámica
- H. Hornos de cal, siglo XVI
- I. Lavaderos
- J. Escultura de Francisco Toledo

Secciones Temáticas

- I. Vegetación del valle de Oaxaca
- II. Jardín de rocas
- III. Plantas medicinales
- IV. Agricultura indígena
- V. Huertos y solares
- VI. Bosque tropical húmedo
- VII. Bosque de montaña
- VIII. Plantas relacionadas con las artes de Oaxaca
- IX. Bosque tropical seco
- X. Plantas de las zonas más secas de Oaxaca
- XI. Patio del huaje

Map of Oaxaca Ethnobotanical Garden

All of the plant species found throughout the garden are native to the state of Oaxaca, and come from a variety of different biomes. Each species was selected because of its cultural significance, serving as food, firewood, fibers, medicines, condiments, or dyes. In addition to keeping a nursery, herbarium, seed bank, and library for public consultation, the Ethnobotanical garden offers free guided tours for school groups, public workshops, and payed tours in multiple languages for visiting tourists. The garden serves as a method for preserving Oaxacan biodiversity and culture, while offering visitors an insight into the regions history, art, and traditional ecological knowledge.



Overhead View of Garden

Source: ([Jardín Etnobotánico de Oaxaca 2018](#))

TAKEAWAYS

- Reflects history and culture
- Preserves biodiversity and culture

Ñape Center – Peurto Maldonado, Peru

The Ñape Center was established in 1986 by a few Shamans in an effort to preserve and promote the traditional use of medicinal plants in the area. Initially set up as a nature reserve where locals from the nearby community of Infierno were prohibited from hunting, farming, and timber harvesting, the center has grown into an ecotourism venture with the addition of a lodge. The lodge is meant to educate visitors about Ese Eje, culture and traditions, as a way of keeping that culture alive. It

also hosts Ese Eje language workshops, documents, traditional songs and stories, and gatherings for community members, all in the name of cultural rescue.



Courtesy of Dr. Carter Hunt

One way visitors get to experience this is by going on a guided tour of the medicinal garden which they have set up within the reserve. During the tour, visitors are taught by a local guide about the various native plants, their medicinal uses, and how they are prepared. The center gives indigenous community members free access to the medicines as an alternative to the less accessible modern alternatives, and guests visiting the center can also try the treatments, for a small fee. The center and accompanying lodge is a great

example of an indigenous ecotourism venture that is keeping ethnomedicinal knowledge alive while giving visitors authentic exposure to community resource management practices.

Source: ([Moerland, 2014](#); [Stronza, 2000](#); [Stronza, 2010](#))

TAKEAWAYS

- Educates visitors
- Preserves culture
- Preserves ethnomedicinal knowledge
 - Authentic exposure for visitors

Healing/Wellness Centers

Somatheeram Ayurveda Village – Kerala, India

The state of Kerala, India has capitalized on the draw of healthcare tourism by offering traditional Ayurveda holistic practices ([Hannam, 2009](#)). Ayurveda practices typically take the form of internal purification, diet, or massage, and the popularity of such experiences in Kerala has been wildly popular, bringing in over 6 million tourists each year ([Hannam, 2009](#)). Somatheeram, which claims to be the world's first Ayurveda hospital with a resort ambience, has been in practice for over 30 years under the expertise of 20 Ayurvedic doctors and 90 trained therapists. It is highly regarded as one of the best Ayurveda treatment centers, and is accredited by the National Accreditation Board for Hospitals & Healthcare Providers Quality Control of Government of India. In addition to providing a wide variety of traditional treatments and diets, the village also makes their own medicines on site from over 600 herbs. Providing a very luxurious experience, Somatheeram gives its guests, in addition to Ayurvedic practices, exposure to traditional Kerala cuisine, art, and culture.



Patients at the Ayurveda Hospital

Source: ([Hannam, 2009](#); [Somatheeram, 2018](#))

TAKEAWAYS

- Produces natural medicines
- Provide traditional healing

Village of Hévíz, Hungary

The village of Hévíz has become one of Hungary's many popular wellness destinations, largely because of its biologically active natural thermal lake, the largest in the world. The village welcomes 220 thousand guests each year, who collectively spend around 1 million nights in the village hotels, generating 49.6 million in GDP in 2013. The lake, which formed 22 thousand years ago, is known and valued for its variety of healing minerals and therapeutic mud. This is a big draw for tourists, who visit the lake to heal joint conditions, recover from



Thermal Lake of Hévíz

injuries, receive relief from pain, or just relax. Many of the hotels advertise themselves as wellness or medicinal hotels, which the Hungarian government has legislation and regulations for. A relatively small town, Hévíz relies on this market of wellness tourism and traditional healing to employ roughly half its population, about 2,500 people. Hévíz is a great example of how an area can capitalize on its natural resources as a means of bringing in tourists.

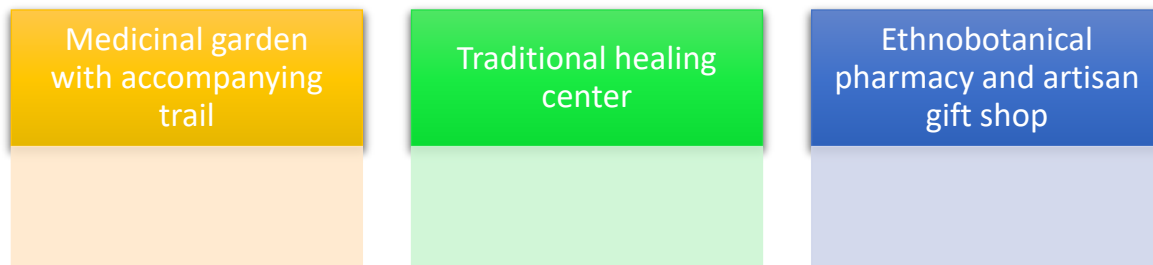
Source: ([TOHWS, 2014](#))

TAKEAWAYS

- **Provides natural healing**
- **Promotes wellness tourism**

PROJECT OUTLINE

In an effort to preserve the ethnomedicinal knowledge found in the communities around UMNP, and to provide ecotourists with an authentic, enriching cultural experience, this project draws from local knowledge and the success of similar ventures to create a new opportunity to learn about the medicinal practices of traditional healers operating in and around the area. It features 3 main components:



Together, these 3 components make common medicinal plants more accessible and available for community members, offer a space for traditional healers to conduct their practices, and give visitors an opportunity to experience and learn about these traditional practices and their many applications.

Medicinal Garden

The Plants

The medicinal garden features a wide variety of plants, most of which are indigenous to the area, and some that are foreign, but commonly cultivated for their medicinal uses ([Table 1](#)). The plant species come from a variety of different climates and biomes found around the Udzungwa Mountains, to offer as many different sources of medicine as possible, while drawing from the vast knowledge base of healers practicing in the various villages neighboring UMNP. This includes the plants growing natively in the Kilombero valley, those growing at the higher elevations in the mountains, and the plants growing in the drier climates west of the mountains. To accomplish this, many of the species need to be cultivated in artificial habitats, which requires the coordination with people living in the native regions of these species, and the collective sharing of this knowledge. This adds to the scope of the preservation of this ethnomedicinal expertise, creating a larger base of understanding to be available for future generations. By including plant species from multiple climates, there are also more substances available for use in traditional medicines. The plants are cultivated in a way that mimic their natural environments to the closest extent possible, using modern botanical science in addition to traditional knowledge to replicate their ideal growing conditions.

Scientific Name	Local Name	Use	Methods of Use
<i>Acokanthera schimperi</i>	Mmemeng'oro	Snakebites and stomach pain	Powdered dry leaves and roots are used for snakebite, leaf infusions are taken for stomach.
<i>Adansonia digitata</i>	Mbuyu	Fever, exhaustion, diarrhoea	Bark decoctions are used for steam bathing for fevers, root decoctions are taken for exhaustion and fruit pulp is used for diarrhoea.
<i>Adenia cissampeloides</i>	Ligolomosi	Madness and mental disturbance	Root powder added into leaf decoction and taken orally twice per day, or added to bathing water.
<i>Agarista salicifolia</i>	Mkolongo	Toothaches, diarrhoea	Decoction of bark is rinsed in the mouth twice daily, leaf powder is boiled and taken three times daily.
<i>Agelaea pentagyna</i>	Mlungamo	Rheumatism, Pneumonia	Decoction of roots is taken for seven days for rheumatism; leaves are pounded and boiled, then taken twice daily for pneumonia.
<i>Albizia amara</i>	Mtanga	Open wounds and purgative	Leaves are used to treat wounds and bark decoctions to induce vomiting.
<i>Albizia gummifera</i>	Mtanga	Rashes	Bark powder is stirred in warm water and foam is applied twice daily.
<i>Bauhinia spp.</i>	Msegese	Diarrhoea	Leaves can be chewed to treat diarrhoea.
<i>Bersama abyssinica</i>	Mbasamono	cold, headaches, menstruation pains and infertility	Bark is sniffed for colds and headaches, bark and roots are taken for menstruation pains and infertility.
<i>Cassia alata</i>	Msekeseke	Fungal infections	Leaves and roots used to treat ringworm, impetigo, scabies, leprosy and eczema.
<i>Catunaregum spinosa</i>	Mtutumo	Loss of appetite and vomiting	Liquid from the bark is boiled and drunk before bubbles go down.
<i>Cordia sinensis</i>	Mtundwa	Malaria, dry coughs	Root decoction is used for malaria; dry fruit is eaten for coughs.
<i>Deinbollia kilimandscharica</i>	Mkongwa	Hernia	A decoction from the roots is taken orally.
<i>Dichrostachys cinerea</i>	Mohanidume	Burns, body swellings and arthritis	Powdered bark decoction is used for all three ailments.
<i>Dodonaea angustifolia</i>	Mguina	Diarrhoea, bleeding wounds, skin rashes, flu	Leaf infusions are taken for diarrhoea and colds; leaves are pounded into powder and mixed with water for wounds and rashes.
<i>Dombeya rotundifolia</i>	Mtogo	Abdominal pain	Dry roots are pounded, burned and sniffed.
<i>Dracaena manii</i>	Mdetema	Measels	Leaves can be drunk to treat measels.
<i>Ekebergia capensis</i>	Mulimuli	Fungal infections, skin rashes, acne, chronic coughs	Poultices made from the powdered bark are applied externally to skin; root decoctions are used to treat coughs and scabies.
<i>Entada Abyssinica</i>	Lifute	Flu	Bark is dried on the sun, squeezed and sniffed.
<i>Erythrina abyssinica</i>	Kirundurundi	Trachoma, burns and body swelling	Liquid squeezed from bark can be applied twice daily on the eyes; roasted and crushed bark forms a paste for burns and inflammation.
<i>Euclea divinorum</i>	Mdaa	Stomachaches and chest pains	Dried root powder mixed with hot water is drunk twice daily for stomachaches; boiled roots are drunk for chest pains.
<i>Grewia bicolor</i>	Umwimwi	Diarrhoea, colds and chest pains, intestinal worms	Root decoctions are used for diarrhoea and colds; boiled bark powder is drunk for colds and chest pains; leaf decoctions are taken for intestinal worms.
<i>Kigelia africana</i>	Mfungutua	Malaria and Measles (in children)	Boiled leaf powder is drunk for malaria; Children are washed with a beer made from fermented fruits as measles treatment.
<i>Moringa oleifera</i>	Mlongitongi	Skin and fungal infections, malnutrition	Gum of the plant can be dissolved in water and applied to skin; leaves can be eaten fresh or dried and mixed with other dishes.
<i>Ocotea usambarensis</i>	Muheti	Malaria, headaches, whooping cough	Fresh pounded roots can be boiled and drunk for malaria; ground roots and bark can be sniffed for headaches; boiled stem bark can be drunk for whooping cough or bronchitis.
<i>Prunus africana</i>	Mnandawi	Stomachaches and fever	The bark is used for stomach pains while the leaves are used as an inhalant to relieve fever.
<i>Rhus natalensis</i>	Uhehefu	Heartburn, abdominal pain, hookworms	Pounded fresh leaves are chewed for heartburn and drunk for abdominal pain; dry root powder is drunk daily for 2-3 days for hookworms.
<i>Ricinus communis</i>	Nyonyo	Laxative, stimulates appetite	Root decoction stimulates appetite and alleviates abdominal ailments.
<i>Simylyx ancepsy</i>	Mkwangasale	Cavities	Liquid is drunk from the vine.
<i>Solanum incanum</i>	Matulatula	Toothache, earache, warts and skin ailments	Fruit pulp can be rubbed on the teeth, or applied to the skin; Boiled fresh leaves can be applied as ear drops.
<i>Syzgium cuminii</i>	Mvenge	Diabetes, weak gums, wounds and nosebleeds	One teaspoon of dry fruit kernels can be taken twice daily for diabetes; boiled fresh bark can be used as a mouthwash; seeds can be grinded as a sniff powder for nosebleeds.
<i>Syzgium guineense</i>	Mvenge	Stomachaches and anthelmintic	Fresh bark and roots are pounded and drunk with cold water for stomach ailments.
<i>Tamarindus indica</i>	Mkwaju	Premature ejaculation, indigestion	Roasted seeds are pounded and drunk for premature ejaculation; Ripe fruit with removed seeds can be mixed with water and drunk for stomach problems.
<i>Teclea nobilis</i>	Mpembesa	Malaria, pneumonia and fever	Fresh bark is drunk to treat malaria, and boiled fresh leaves are drunk to treat pneumonia; boiled leaves are inhaled in steam vapour to treat fever.
<i>Trichilia emetica</i>	Mbokoboko	Skin ailments, malaria and fever	Pounded fresh leaves or seeds can be mixed with water and applied on skin; steeped fresh leaves can be drunk for malaria and fevers.
Unknown	Likamanda	Blood clotting and loss of consciousness	Liquid is drunk from the vine.
Unknown	Mmavimmavi	Severe fever on children	Leaves can be drunk to cure fever in children.
<i>Utika masaica</i>	Lougen	Leg Inflammation	Pounded leaves can be applied on skin.

Table 1: Common Medicinal Plants of East Africa and their Uses

Source: (Dharani & Yenesew, 2010; Mwakisoma & Uisso, 2017; Shangali et al, 2008, in Frass, 2017)

The Trail

In order to give visitors the most access to the collection of plant species, a small system of trails gives visitors the ability to view everything on foot. Along these trails there are interpretive signs ([Figure 1](#)), with pictures of different parts of each plant, some of which may not be visible from eye level, in the case of larger trees. The signs also feature information about which parts of the plant are traditionally harvested, and the process by which an individual goes about doing that. Finally, each sign has a bit of information detailing what all the plant is traditionally used for, and how the substance used is prepared. Throughout the tour process, visitors are accompanied by local guides, who are able to offer their personal experience with each of the plants, in addition to answering any questions visitors may have. These guides have extensive knowledge of the plants native to the area where they come from, and have learned about the plants found in other biomes from those who are native to that region. This training process assures that each guide is knowledgeable about each of the plants found within the garden, while further promoting the sharing of ethnobotanical knowledge and cultural relations to the variety of species present.

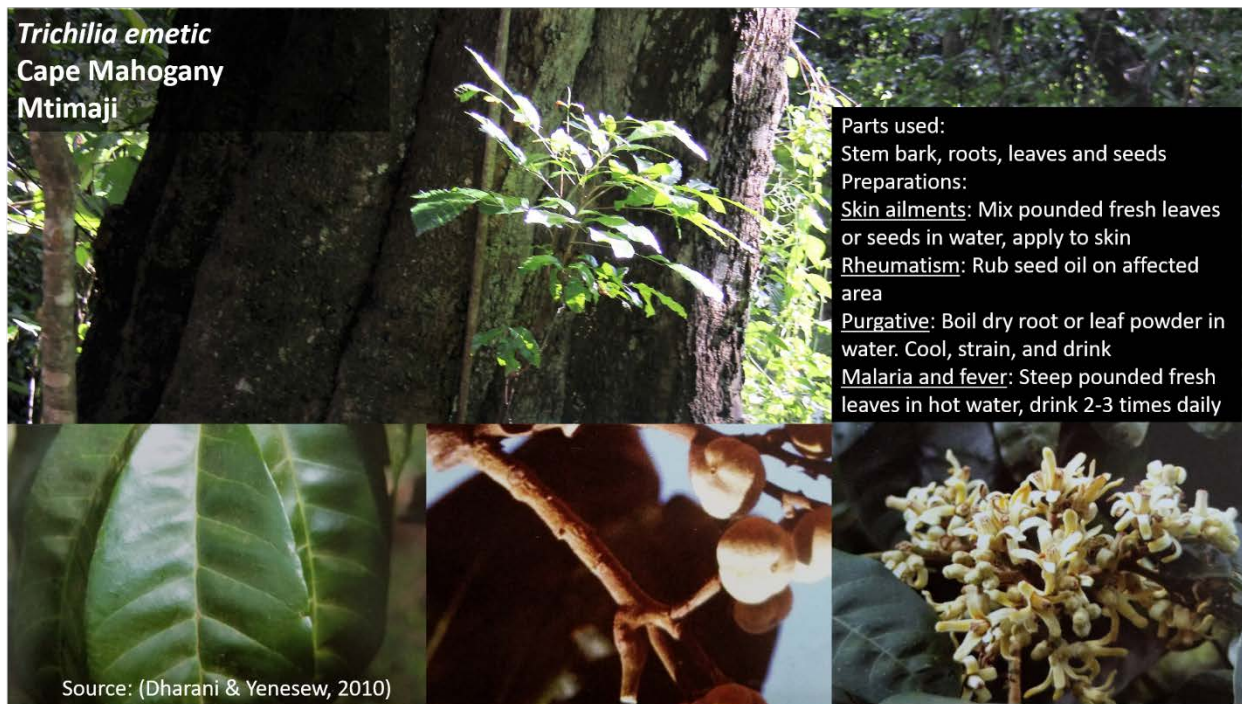


Figure1: Example of Interpretive Sign

The Nursery

As a way of assuring the consistent availability of plants, both for visitors and community members, there is a plant nursery on site. This is a useful resource for the cultivation of certain medicinal plants outside of their natural biome, as it is easier to control the environment in the nursery. It also acts as a storehouse and seed bank for some of the most commonly used plants, to ensure that there is continuous supply of whatever is needed by community members and healers alike. Finally the nursery serves as an effective teaching center for school groups interested in learning about plant cultivation and ethnobotany.



Plant Nursery at Udzungwa Ecological Monitoring Center

Healing Center

The onsite healing center serves a number of functions. First, it gives traditional healers a space to practice their work, year round. Second, it acts as a reliable healthcare center that can offer traditional treatments to multiple patients each day, with lower costs than other healthcare options present in the area. Finally, it allows tourists to witness, and, if they choose, experience traditional healing practices firsthand.

The center's design features a check-in area, where patients can consult with a practicing healer, who determines what the patient needs to be treated for, and if it is within the capabilities of the center. All patients with serious medical concerns are asked to seek modern treatment first before consulting traditional services. Patients are then directed to a waiting area, where, if interested, they can learn about various cultural traditions and how healing practices vary from one ethnic group or tribe to the next. Collecting this knowledge and having it all in one place promotes the preservation of each group's practices, and also allows healers to share and learn from each other. Visitors benefit from this by learning a bit about all of the cultures collectively, so they have a fuller picture of the topic of ethnobotany in the region. Once a healer is available, he or she takes a patient back in to one of the centers private rooms,



Courtesy of Dr. Carter Hunt

Visitors also benefit, because they have the opportunity to try traditional medicine treatments for minor ailments, without going through a healer, if they don't wish to spend the money or time to do so. The sale of these products also promotes the preservation of the culture, while additionally promoting the sustainable use of the plant species involved.

IMPLICATIONS

With villages around UMNP growing in size and becoming more developed each year, and locals having limited access to the resources of the forest, the cultural and spiritual ties within the communities are dwindling ([Harrison, 2006](#)). This trend can be expected to continue and accelerate with the paving of the main road coming through the area, leading to villages becoming more modern and heterogeneous. Acknowledging this, as well as the dwindling availability of resources, there is a clear need for the preservation of ethnomedicinal knowledge held by members of the communities. With ecotourism becoming an ever more popular venture in Tanzania, an opportunity to preserve this culture, while giving tourists the opportunity to experience and learn from it, is available. The creation of an ethnomedicinal garden and traditional healing center will provide visitors with authentic exposure to local culture, while preserving these practices in the process.

This project is also an example of how indigenous ecotourism can serve to benefit communities, while offering something that attracts visitors. It would give the area a unique tourism draw that cannot be found in the northern circuit of parks, adding to the diverse appeal of UMNP. As tourists come to experience the culture of traditional healers and learn about the plants used in their practices, they are contributing to the preservation of TEK while also bringing income into the community. This knowledge is also preserved by the sharing of differing traditions between healers from various tribes and ethnic groups, which adds to the depth of information being collected.

By revitalizing practices of TEK in the garden and pharmacy, the center will provide benefits to the community in the form of access to affordable traditional medicine, and the responsible conservation of the environment and its biodiversity, both in a way that is sustainable and engaging for locals. The sale of local goods through the pharmacy also offers local community members an opportunity to directly benefit from the center. By intentionally working to conserve the knowledge, traditions, and practices of healers in this region, this project will serve as an effective tool for preservation, contributing to the cultural survival of the region, through the means of indigenous ecotourism.

Conclusions

Creating an indigenous ecotourism operation in the villages surrounding UMNP, focused on preserving the ethnomedicinal knowledge in the area, will enrich the lives of both the tourists and the locals involved. The method that has been outlined above calls for the implementation of a medicinal garden, a traditional healing center, and an ethnobotanical pharmacy. Together, these components will provide affordable traditional healthcare, promote the sharing of ideas across cultures, conserve biodiversity, and allow for tourists to engage in a unique and authentic healing experience. Collectively, they will encourage the permanence of TEK in the area, ensuring that future generations can engage in and learn from these practices and beliefs. The bio and cultural diversity of areas all around the globe are currently threatened by the rapid pace of development and modernization. TEK is an important component of the region's cultural heritage, and by keeping it alive, this project will help to ensure the cultural survival of the area.

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