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**SCIENCE**

# SAYANSI

*Telling the African science story*

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## Rescuing Kenya's magnificent birds of prey

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mineral licks

Restoring the only  
river on Mombasa  
island

Kenya's efforts to  
save the sea turtles  
bears fruit

**T**he Media for Environment, Science, Health and Agriculture (MESHA) was founded in November 2005 in Nairobi, Kenya. The organisation provides support to science journalists covering health, development, technology, agriculture and the environment. It does so by offering training workshops, consultancies and encouraging networking through meetings and conferences among journalists, scientists and other stakeholders in Kenya.

The association emphasises journalism and communication with more focus in rural areas.

MESHA's formation was motivated by the realisation that there were many organisations and communicators in the fields of agriculture, environment, health and development, yet few within Africa would bring journalists covering these issues together, to enable better reporting and coverage in the media.

MESHA believes that in a democratic society where science must be answerable to the public, there is need to find new and innovative ways of effective mass communication about the benefits of science, and other areas of concern to the general public.

MESHA aims to ensure continuity, sustainability and consistent coverage of science and development issues as they arise.

## SAYANSI

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Cover Photo: Shiv Kapila, Director of the Naivasha Raptor Centre, tends to the birds at the facility, which serves as a first base for incoming injured birds where initial treatment and housing is provided.

Photo Credit: James Wakibia



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# Let's not forget marine biodiversity in our conservation efforts

In the face of escalating environmental challenges, the conservation of marine resources has become an urgent global priority. As the oceans bear the brunt of human activities, ranging from overfishing to pollution and climate change, adopting robust conservation measures is crucial to ensure the health and resilience of marine ecosystems for future generations.

Marine biodiversity plays a vital role in the world. Mangrove ecosystems, coral reefs, and other coastal habitats protect coastal areas from natural disasters. They also provide habitats for a diverse range of species, supporting both marine and terrestrial life.

Therefore, the overexploitation of these resources poses a significant threat to the delicate balance of marine ecosystems. For example, overfishing not only depletes fish resources but also disrupts the intricate food webs that sustain marine life. This is made worse by plastic pollution, which has become rampant over the years and climate change, leading to rising sea temperatures, ocean acidification, and extreme weather events.

In this edition, we highlight the different ways marine resources have been impacted by various factors. We also show how community engagement is vital in reversing the destruction or loss of biodiversity in various areas of the country. For example, the coastal women in Kenya and Tanzania have started earning income from seaweed and contributing to its conservation.

It is clear from such stories that empowering local communities, especially those reliant on marine resources for their livelihoods, is integral to effective conservation. It not only ensures that by being part of decision-making processes, communities get to own the conservation efforts and resources, but also promote social equity and economic stability. Already, communities have taken an initiative to monitor activities to ensure the effectiveness of conservation efforts for example by highlighting illegal activities such as poaching. As such, it is vital that local communities are empowered with information and skills to realise the sustainable development of the sector.

Even so, all stakeholders must take up their role in marine biodiversity conservation. From collaborative research, sound governance to coordinated inter-country conservation strategies are essential to tackle global challenges such as the protection of migratory species. Other essential actions such as investing in cutting-edge technologies, and tools such as satellite monitoring, and artificial intelligence can significantly enhance the monitoring and management of marine resources.

Conserving marine biodiversity requires a concerted effort from governments, industries, communities, and individuals alike. We must all embrace the responsibility to protect our oceans, and preserve the wonders of our seas for generations to come.



**Marine resources play a vital role in the world. Mangrove ecosystems, coral reefs, and other coastal habitats protect coastal areas from natural disasters. They also provide habitats for a diverse range of species, supporting both marine and terrestrial life.**

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Photo Credit: Kemunto Ogutu



Mtopanga River conservation group turned to building durable and low-maintenance boats from recycled plastic bottles.

# Mtopanga: Breathing a new life to a 'dead' river

By **Kemunto Ogutu** | [healthjournalist3@yahoo.com](mailto:healthjournalist3@yahoo.com)  
and **Steve Mokaya** | [stevewebsmtz@gmail.com](mailto:stevewebsmtz@gmail.com)

Over the years, Mtopanga, the only river on Mombasa Island, had become a dumping site for all manner of waste. It was an illness that flooded homes, drove out tourists, caused recurring outbreaks of waterborne diseases and left the Jomo Kenyatta (Pirates) Beach in a sorry state.

This bleak scenario spurred Peter Mchombo and his fellow islanders to establish the Mtopanga River Conservation Community Based Organization (CBO), embarking on a crusade to resuscitate their riverine lifeline.

The members started their efforts by conducting regular river clean-up, where they would fish out plastic and other garbage from the river before it reached the ocean. However, with time, their efforts proved futile as residents would continue to pollute the river from upstream.

To make their efforts sustainable, Mchombo and his team decided to turn waste into value through innovative commodities such as flower planters, vases, and dustbins from plastic bottles. Their creations were not only aesthetically pleasing but also served a practical purpose, providing much-needed income for the CBO and fueling their ongoing conservation efforts.

## Turning plastic waste to valuables

Mchombo says that the community has since committed to collecting plastics and selling them to recycling companies or to the CBO for their plastics projects. Mchombo believes their efforts have seen a marked decrease in the volume of plastic that drains into the ocean at the Pirates Beach.

Charles Vuko, the head of the CBO's ecotourism unit, noted that despite the 2017 ban on plastic bags, many horticulturalists in Mombasa still use the

bags to plant their seedlings. The CBO discourages this practice, advocating of using coconut husks in place of polythene bags. The husk is biodegradable and eventually becomes manure for the growing seedling.

"We also ensure the sensitization of our community beginning with our own families. We have taught our children that plastic can be recycled. "That they should not litter the environment with waste, rather, they should find ways to reuse or recycle the plastic," he said.

Vuko believes that teaching children from a young age to respect and conserve rivers and water catchment areas is the key to conservation.

This 50-member CBO has also revolutionized conservation by crafting durable and low-maintenance boats from recycled plastic bottles. These vessels, led by skilled builder Suleiman Said, boast superior longevity compared to traditional wooden boats, requiring minimal upkeep. This not only empowers the CBO's conservation efforts but also serves as a powerful symbol within the Mombasa community, raising awareness and inspiring sustainable practices.

Beyond its environmental impact, the plastic boats have also become a tourist attraction for the organisation. Miriam Ndune, Suleiman's assistant, emphasized this benefit as an awareness tool, while Mchombo noted that the plastic boats have directly contributed to the preservation of mangrove forests, leading more fishermen to opt for this sustainable solution over traditional wood-based vessels.

## Concerted efforts

Three years ago, Coastal and Marine Resource Development (COMRED) played a pivotal role in the establishment of the Mombasa Smart Sustainable City Forum under the Miji Bora project. This initiative paved the way for the formation of five technical working groups, including the Transformative River Management. Spearheaded by COMRED, this group has dedicated its efforts to restoring the Mtopanga River, a project that will not only revitalize the river itself but also safeguard the delicate ecosystem of the Mombasa Marine Park.

Photo Credit: Kemunto Ogutu



**Dr Wanyonyi: The country risks losing tourists if River Mtopanga remains dirty.**

Dr. Innocent Wanyonyi, COMRED's director for Sustainable Cities Program says the river is vital to Mombasa's economic vitality, thus the organization's commitment to safeguarding its health and integrity.

However, Wanyonyi said research by COMRED revealed that 65% of waste in River Mtopanga is plastic. The waste, he noted, should be continually, effectively and sustainably combated, lest it jeopardizes biodiversity in the Mombasa Marine Park, which is barely 5km away from Pirates beach. The marine park's coral gardens, sea grass and vast array of species are a major tourist attraction in Mombasa.

He said that the hotel industry along the beach depends directly and indirectly on the river, therefore it should be jealously guarded.

"There are about eleven tourist hotels along the pirates beach stretch, which is also close to the marine park. During the high season, the occupational capacity is well above 70. Naturally, if we disrupt the main attractions by allowing the Mtopanga river to be dirty, then we are going to lose tourists to our neighbouring countries," he said.

Wanyonyi recommended multi-stakeholder action as the lasting solution to the recurring pollution problem in River Mtopanga, pointing out that all the current conservation interventions are segmented. He called for the synchronisation of all efforts in the restoration of Mtopanga for greater impact.

He also announced COMRED's intention to fund some of the river conservation efforts during the second phase of the River's Transformative Management project.

Kenya Wildlife Service (KWS) are part of the multiple stakeholders in Mombasa to restore Mtopanga. Beatrice Jerop, a supervisor at KWS says they also keep track of the quality of water draining into the marine park to ensure the biodiversity is not affected.

In the face of all the challenges, Jerop lauds the work done by CBOs in Kisauni, saying that KWS has witnessed an increase in aquatic life and improved aesthetics in the river since the conservation efforts began.

"Although previously viewed as a dead river by Kisauni residents, Mtopanga is gradually reclaiming its life and improving tourism in Kisauni Sub-county," she says.

## Plastic interceptors

Two-hundred metres from Pirates Beach is another popular tourist attraction; The Bamburi Forest Trails, in the canopy of Haller Park. In its course, River Mtopanga stretches 700 meters along the park's premises.

Rose Sali, The Chief Operating Officer at the park revealed that Bamburi Cement PLC conducts quarterly clean-up programs to restore the river. This year, they collected 1.8 tonnes of litter, with 47% of it being plastic. She noted that intercepting waste higher upstream makes it easier to curb plastic pollution in the ocean.

Paul Opere, the company's Rehabilitation and Aquatic Resources Officer, said they set up strategic wire mesh interceptors where the river passes by their ecosystem to trap the solid waste.

The interceptors trap the bulk of solid wastes, collecting the plastic waste at a central point as the water flows downstream. Opere also noted that some trees along the river have strong roots which act as intercepts of plastic waste. While the path to restoration has not been without its challenges, Mchombo and his team remain undeterred in their mission to revitalize the Mtopanga River. Their tireless efforts, however, are hampered by the delay in gazetting the river as a protected wetland.

"Gazettement would be a game-changer," Mchombo emphasizes. "It would put the Mtopanga on the map, literally and figuratively. People would finally know it exists, and that would be a vital step towards garnering wider support for its conservation."

He envisions a future where tourists flock to the protected river-cum-wetland, drawn by its unique beauty and ecological importance.

*This article was produced with support from JRS Biodiversity Foundation and Media for Environment Science Health and Agriculture (MESHHA).*

# Dried-up lakes in Africa leave trail of destroyed livelihoods

Photo Credit: Thuku Kariuki



An aerial view of Lake Ol Bolossat. The lake's waters had dried up as a result of prolonged drought and impact of human activities.

**The State of Climate Services report shows that in the past five decades, Africa was hit by 1,695 disasters related to weather, water, and climate.**

By Njeri Murigi | [healthjournalist3@yahoo.com](mailto:healthjournalist3@yahoo.com)

**L**ake Ol Bolossat, the only natural lake in central Kenya, is at risk of drying up due to climate change if efforts to save it are not sustained. The lake is not only a source of water to residents in Nyandarua, Laikipia, Samburu, Isiolo and Garissa counties but also a critical biodiversity site and an important bird area. These are Arid and Semi Arid lands listed amongst the most vulnerable to climate change.

"Prolonged drought is not the only challenge the lake is facing. It also faces illegal abstraction of water from the streams and springs which is leading to the dwindling water levels," says Jabes Okumu, Programs and Advocacy Manager at the East African Wild Life Society.

Lake Ol Bolossat is not the only water resource in Africa that has been affected by climate change. Ethiopia, known as the continent's water tower, is also confronting huge challenges of disappearing lakes and rivers.

The country has already lost one of its great water resources, the Haramaya Lake, which once covered 16 km and had a depth of over 9 metres. Harar City, which was dependent on its water, is now searching for an alternative source. Fishing communities have become climate refugees.

Ethiopia has 12 major river basins and most of its lakes and rivers are found in the Great Rift Valley, where the country shares cross-boundary water with Kenya and with other lower riparian countries.

Photo Credit: MESHA



**By 2020, between 75 and 250 million people in Africa were projected to be exposed to increased water stress due to climate change.**

"I used to tap water from Lake Ziway for irrigation but today this is not possible. The lake has shrunk so much that there is a big landmass between my farm and the water area," says Zewudu Molla, a farmer who used to grow vegetables using water from the Lake Ziway one of the lakes in Ethiopia.

According to a new report by the Center for Science and Environment, climate change will have a direct impact on the water resources of Africa, and this will have a major impact on food security.

By 2020, between 75 and 250 million people in Africa were projected to be exposed to increased water stress due to climate change.

Dubbed the State of the Environment in Africa 2023, the report reveals that almost all major river basins in Africa have become the epicenter for conflicts. Countries that have experienced unrest over water include Nigeria, Kenya, Ethiopia, Tanzania, Uganda, Niger, Chad, Cameroon, Egypt, and Sudan among others.

"Lake Chad basin is among the basins that have been long experiencing unrest over water. Disputes started in 1980. Today the water body has diminished by 90 per cent since the 1960s due to overuse and climate change effects. Conflict between herders and farmers has become common as livelihoods are lost. Families dependent on the lake are migrating to other areas in search of water," reads the report.



**Jabes Okumu, Programs and Advocacy Manager at the East African Wild Life Society.**

Lake Chad is located in the Sahel, the vast semiarid region south of the Sahara Desert. It is fed mainly by Chari River through the Lagone tributary, which used to provide 90 per cent of its water. The area is particularly sensitive to drought and the lake has reduced significantly in size due to prolonged dry periods.

As the lake shrinks, communities are struggling and there is competition for the dwindling resource. For years, the lake has been supporting drinking water, irrigation, fishing, livestock, and economic activity for over 30 million people in the region. It is vital for indigenous, pastoral, and farming communities in one of the world's poorest countries. However, climate change has fuelled massive environmental and humanitarian crises in the region.

*Climate change is likely to put added stress on the availability and access to fresh water.*

**- Zinabu Gebre-Mariam, a professor at the Ethiopian Hawassa University**

According to a US-based non-profit organisation World Resources Institute's aqueduct global water risk mapping tool, Africa is one of the world's most water-stressed continents.

About a third of the population lives in drought-prone areas. As per the 2021 edition of the World Meteorological Organisation's *State of Climate Services* report, in the past five decades, Africa was hit by 1,695 disasters related to weather, water, and climate, which have caused 0.73 million deaths and an economic loss of \$38.5 billion.

While floods accounted for 60 per cent of the disasters and 4 per cent of the deaths, droughts were behind 16 per cent of the disasters and 95 per cent of the deaths—the highest human loss due to drought in the world. This is a double trouble for sub-Saharan Africa, where rural population depends on agriculture for income.

According to the World Meteorological Organisation, 5 per cent of Africa's Gross Domestic Product is lost every year due to water scarcity. The Middle East and North Africa region will face the greatest expected economic losses from climate-related water scarcity estimated at between 6 per cent and 14 per cent by 2050. But more than that, it has pushed Africa into a vicious circle of poverty, water and disease.

Photo Credit: Aghan Dan



Sunita Narain from the Centre for Science and Environment says water security is possible through partnerships.

### Rising water demand

Zinabu Gebre-Mariam, a professor at the Ethiopian Hawassa University, says the increasing water demand from many cities and towns located along the Rift Valley lakes has also contributed to the drying up of the water sources. High evaporation due to increasing temperature is also adding to the problem.

“Combined with an increasing population, which will see Africa’s population nearly quadruple in a little more than 100 years, climate change is likely to put added stress on the availability and access to fresh water,” says Mariam.

Africa endowed with more than 10 major rivers with River Nile being the longest, over 100 lakes with Lake Victoria being the largest, and vast wetlands. However, despite all these abundant water resources, Africa is the second driest continent after Australia. Extreme droughts that regularly plague the Sahel and Eastern Africa are well known. Now climate change is exacerbating the paradox, hitting the most vulnerable the hardest.

### So what is the solution to achieve water security in Africa?

Sunita Narain from Centre for Science and Environment says water security is possible through partnerships.

According to Narain, decentralising water and wastewater systems can build resilience at a more localised scale and reduce supply costs. Collaborative governance is another approach that can help in achieving water security.

Through collaborative governance, actors affected by the problem can engage and self-regulate to develop new ways to govern water for the collective benefit.

Collaborative governance is an approach that brings together government, community, and private sectors in a non-adversarial and non-competitive manner to deal with grand challenges such as water security, thereby achieving more than any one sector can do on its own.

*About 70 per cent of Africa is dependent on small and rainfed agriculture that is expected to be badly hit by a changing climate.*  
- Narain, DG, Centre for Science and Environment

“Water crisis is there but we can become water wise because about 70 per cent of Africa is dependent on small and rainfed agriculture that is expected to be badly hit by a changing climate,” says Narain.

According to the environmentalist, while extreme weather is exposing Africa’s infrastructural and economic weaknesses, another creeping risk is the impact of changing climate on food security.

She adds that if Africa does not become water-wise, their cropping system will be stressed leading to a decline in food production in the coming decades.

**Africa is the second driest continent after Australia. Extreme droughts that regularly plague the Sahel and Eastern Africa are well known.**



Photo Credit: Fungus Guy  
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The African Giant Millipede form a large group of millions of small organisms that inhabit a unique ecosystem of coral rag forest found in Kenya's Diani, Shimoni and Chale islands.

## The living 'trains of Mombasa'

By Wanjiru Macharia | wanjirumachari1@gmail.com

Watching them lazily crawling on surfaces on their tens of legs in several parts of the Kenyan coast, one would be forgiven for dismissing them as a nuisance on the face of earth.

Some people even choose to crush them as they perceive them as dangerous, unaware of the vital role they play in cleaning their environment and to ensure soil health by replenishing nutrients back to the ground.

Ironically, while a section of adults wish to terminate them, children who are conversant with the big red-legged arthropods use them as play things especially when they curl up in a ball in an attempt to protect themselves.

Mombasa Train Millipede popularly referred to as the Giant African Millipede is something many residents of the coastal region have grown up seeing in their daily

lives. However, it is slowly being decimated and pushed further away, deeper in the Coral Rag Forests.

To different categories of people, this giant yet gentle crawler is referred to in different terms such as *Chongololo* or *Jongoo* by the locals, *Archispirostrepus Gigas* by scientists, ecosystem engineers by environmental experts.



**The millipedes play a key role in cleaning the environment through decomposition.**

Neville Agesa, an environmental expert based in Mombasa City says these millipedes form a large group of millions of small organisms that inhabit a unique ecosystem of coral rag forest found in Kenya's Diani, Shimoni and Chale islands.

It is also present in other countries that border the ocean.

Agesa goes further to clarify that, unlike the common belief that the coast has mangroves only, coral rag forests are completely different ecosystems with unique characteristics and on different soil conditions.

"Mangroves are dense trees and shrubs which are tolerant to high pressure and harsh sea water which alternates from fresh to saline while coral rag reef forest is a high biodiversity scrub vegetation that is in-between a thicket and a forest," he says.

Agesa adds that coral rag forests are mainly shrubs that are between 10m and 15m tall, which grow directly from porous limestone rock, an ancient coral reef, and stand on thin layers of soil made up of dead decaying matter.

"This type of forest forms an irreplaceable biodiversity that is a hotspot for the endangered Columbus monkey and five other ape species which include baboons, bush babies and vervet monkeys. It is also home to smaller wild cats," he says.

He observes that the millipedes feed on microorganisms, which are excreted as soil thereby playing a key role in cleaning the environment through decomposition.

"The millipedes which have between 300 to 400 legs with each segment having two pairs of legs are largely vegans. They feed on small fruits and aid in dispersing seeds," says Agesa, who is also the Africa Climate and Environment Foundation (ACEF) Chief Executive Officer.

The many legs help it dig and burrow into the soil, slide into decaying logs and climb onto higher surfaces.

Agesa notes that the cylindrical invertebrates are very good recyclers because they break up dying, dead and dry plant material to catalyse decomposition while at the same time enabling the release of nutrients back into the environment.

Speaking during a media science cage hosted by Media for Environment, Science, Health and Agriculture (MESHA) Science Café in Diani and Shimoni islands, Agesa adds the millipedes also excrete calcium carbonate, which hardens to form the coral reefs.

The scientist says that Diani is normally lush during the dry season with fallen dead leaves due to the changing weather and sedimentation.

He adds that the millipedes which thrive in wet conditions also hibernate in January, February and March.

“They resurface at the onset of the first rains at the end of March for reproduction, they deposit their eggs below the dead leaves after which they, together with the juvenile millipedes feed on the dry matter to grow the soil and an underneath forest,” he says.

On ecosystem balancing in the coral rag, Agesa says the millipedes are a delicacy for birds, monkeys and snakes.

He blames false perception, development and encroachment onto riparian land, agricultural activities and use of chemicals for the reducing numbers of these powerful decomposers.

“People are demarcating land and building high walls which is disadvantaging the millipedes and other crawling insects and invertebrates,” he says.

Agesa also blames the displacement of predators which feed on the millipedes for an imbalance in the ecosystem.

“While it is easy to see them as enemies for eating other species, the scientific truth is that they prey on dominant species and reduce consumer pressure,” he notes.

A resident, Aisha Hassan says the millipedes are electrocuted when they get into contact with power from electric fences.



African Millipede break up dying, dead and dry plant material to catalyse decomposition.

*Arthropods that go into hiding during harsh weather risk suffocation.*

**- Aisha Hassan,  
Diani resident**

“Developers have erected electric fences on their beach plots which electrocute millipedes that attempt to climb” she says.

She observes that climate change is also a major challenge to the crawlers due to prolonged rainy or dry seasons which go against their hibernation timing.

“Millipedes and other arthropods that go into hiding during harsh weather risk suffocation if they elongate the hibernation period, coming out of hibernation before the rains is also unfavourable because they thrive in wet conditions,” says Hassan.

Bakari Zonga who is part of a team that protects turtles along Funzi Island, says that the giant millipede, which measures up to more than 30cm long, loves human beings but people are eliminating it in numbers.

Zonga claims that road kills are also a danger to the millipedes, insects and other animals such as the wild cats.

He says he once counted more than 100 crashed millipedes, four snakes and two serval cats along a 1km stretch of tarmac road in Diani.

Diani is located approximately 20 miles south of the city of Mombasa, in Kwale County. It is one of Kenya most popular beach destinations.

He vouches for creating awareness among the communities about the vital role of every living organism on planet earth regardless of how insignificant they may seem.

He also warns against destruction of coral rag forests saying that it may take millions of years to recover the ones plundered.

# The hidden treasures: The struggle to protect Kenya's coastal caves

By John Muchangi | jomunji@yahoo.com

**M**any Kenyans often perceive caves as dark and sometimes perilous places, often linked to Mau Mau hideouts. However, for a variety of plant and animal species, these caves serve as unique habitats. One such cave, Panga ya Saidi in Kilifi County, has been home to a three-year-old nicknamed "Mtoto" for an astounding 78,000 years.

In 2013, archaeologists uncovered human skeleton fragments in Panga ya Saidi cave. Dr. Emmanuel Ndiema of the National Museums of Kenya recalls the initial excitement, but the delicate bones required careful study. The full skeleton, belonging to a 2.5- to three-year-old boy named Mtoto, was eventually exposed in 2017. Tests at Spain's National Research Center on Human Evolution confirmed the intentional burial of Mtoto, making it the earliest known human burial in Africa, dating back 78,000 years.

Panga Ya Saidi, along with Mawe Meru and Chasimba caves in Kilifi County, is being advocated by the National Museums of Kenya for inclusion in the UNESCO World Heritage Site List. Beyond its historical significance, Panga Ya Saidi holds agricultural importance, with seeds of African crops discovered within. Additionally, non-native animals, artifacts like marine shell beads, glass beads, and Tana ware pottery have been documented.

The cave also played a crucial role in the independence struggle of the 1950s, serving as a hideout to evade taxes imposed by Arab colonialists. Mwanza Mwangiri Ndoro, a 60-year-old Kilifi Kaya elder, emphasizes the cave's cultural significance, sharing that traditions, including prayers, continue to be observed. The cave remains a sanctuary where people seek solace and offer prayers, preserving its rich history.



Photo Credit: John Muchangi

**Excavators dig at Panga Ya Saidi cave, the home of Africa's oldest burial site, has significant cultural value to the community.**

Panga ya Saidi lies about 15 kilometres from the Indian Ocean in the Dzitsoni limestone hills.

Thirteen rivers extend across the area, creating floodplains and alluvial valleys. The site's environmental surroundings are part of an overall transition from low coastal plains to coastal uplands to high coastal plains.

According to the National Museums of Kenya (NMK), the cave and its surroundings are an important tourist attraction. NMK collaborates with Max Planck Institute for the Science of Human History, of Germany, for research into the cave's past.

"The partnership has helped to establish the significance of Panga ya Saidi for understanding the Middle to the Later Stone Age technological transition as well as the proliferation of symbolic objects such as bone tools, engraved ochre, and beads in Late Pleistocene eastern Africa," NMK said in its submission to UNESCO in June, 2023.

Ndoro highlights the positive impact of ongoing research at Panga Ya Saidi, stating that it has generated employment opportunities for local youth and attracted tourists who contribute to the income of landowners. However, conservation efforts face challenges due to the cave being on privately owned land.

"It has not become communal land, so only the landowners benefit from tourist payments," Ndoro explains.

Despite the county government's allocation of Sh5 million (USD 31,250) for the cave, a lack of a Memorandum on ownership led to the funds being reallocated.

A few kilometers away, Chasimba Cave in Chonyi, Kilifi South, presents a mesmerizing labyrinth of stones, forming unique designs with openings resembling Cathedral domes. Despite road challenges caused by El Nino rains, the cave attracts visitors and hosts 30 threatened plant species, listed on the International Union for Conservation of Nature (IUCN) List.

Chasimba Cave and its outcrop hold significance as Key Biodiversity Areas, recognized globally by a partnership including BirdLife International, IUCN, Global Environment Facility, and the World Wildlife Fund. The National Museums of Kenya advocates for Chasimba's inclusion in the UNESCO World Heritage Site list, emphasizing its role in a unique ecosystem with rare and endemic biodiversity.

Chasimba Cave is home to the world's only *Cola octoloboides* and *Euphorbia wakefieldii*, two endangered plant species exclusive to Kenya. The *Tarenna drummondii*, a native Kenyan shrub, is also found here. Nicholas Bandari, the cave chairman, underscores the need for protection to safeguard these unique plants. The cave, though accessible for visitors, faces challenges such as deforestation and illegal logging.

Bandari believes Chasimba has tourism potential surpassing that of Fort Jesus, a UNESCO World Heritage site in Mombasa. Visitors pay fees (Sh500 (USD3.1) for locals, Sh1000 (USD6.3) for foreigners), providing income for the community. The cave hosts cultural rites, including prayers for healing and problem solving.

However, deforestation persists, impacting the ecosystem. Bandari highlights the importance of UNESCO listing for protection against activities like illegal hunting. While steps have been taken to remove animal traps, the lack of protection poses threats to wildlife.

The National Museums of Kenya also seeks UNESCO listing for Mawe Meru Cave, home to endemic plant and animal communities.



Cave chairman Nicholas Bandari says the Chasimba Cave has a huge tourism potential.

## Destruction of caves can lead to species extinction and disrupt the delicate balance supporting disease regulation.

Large-scale limestone mining poses a significant threat to biodiversity in the area.

"It is common knowledge that mining through blasting weakens the geologic integrity of rock formations. Blast-mining is a great risk to this site and the area around Mawe Meru that can lead to loss of flora and fauna within this 'island' setting and also to the community living around the rocky outcrop," NMK said, while seeking UNESCO listing.

Agneta Karemba, Chief Officer of Culture and Social Services in Kilifi County, acknowledges the underrepresentation of cave ecosystems in conservation planning. The county aims to involve the community in conservation efforts, stressing communal ownership for effective protection.

Despite budget allocations for cave protection in 2022/2023, projects were hindered by the caves being on private land. Karemba stresses the importance of community involvement and collaboration with national entities to ensure the conservation of these unique and vital cave ecosystems.

Karemba recounts her recent visit to Chasimba Cave, expressing the need for safety measures such as fencing, cleaning, and installing lights with security personnel. Once the caves return to community ownership, proper tourism marketing will be implemented.

Research emphasizes the ecological importance of caves, hosting unique plants, blind insects, and small animals. Destruction of caves can lead to species extinction and disrupt the delicate balance supporting disease regulation. For instance, bats in Kenyan caves play a vital role in controlling disease-carrying insects like mosquitoes.

In 2023, Unesco's World Heritage Committee met in Riyadh, Saudi Arabia, to consider new site nominations. Despite Kenya's unsuccessful bid for the three Kilifi caves, the committee inscribed only 13 out of 53 globally vying sites on the World Heritage List.

Being excluded may provide an opportunity for Kenya to prepare infrastructure for the Kilifi Caves, avoiding potential negative impacts associated with increased tourism. While inclusion on the list is a prestigious recognition, careful planning is necessary to balance conservation and community well-being.

*This article was produced with support from JRS Biodiversity Foundation and Media for Environment Science Health and Agriculture (MESHA).*

# How Mzee Zonga is saving 'the guardians of the oceans'

Photo Credit: Francis Mureithi



Mzee Bakari Zonga, a turtle monitor at Funzi Island and Neville Agesa (right) the CEO of Africa Climate and Environment Foundation display the bones of a turtle killed by poachers on the island.

By Francis Mureithi | [mureithifrancis1964@gmail.com](mailto:mureithifrancis1964@gmail.com)

As he bends beneath a thick mangrove forest in Funzi Island, a few kilometres South of Diani Beach in Kenya's coast, you could easily mistake him as one of the tour guides on the isolated islands.

As Mzee Zonga glides silently through the flooded forest under the canopy of mangroves it is like traveling back in time.

There are no electric wires. No street lighting, and no central water supply. No roads. Life is so relaxed and taking a working tour by foot, you cannot fail to enjoy the ambiance and fragrance of the fresh sea breeze from the isolated island.

There are no present-day modern beach resorts with high-end designs in Funzi Island but simple properties that reflect the influence of the local community and coastal architecture.

A large part of the island remains inhabited, an ideal environment for privacy.

"Funzi Island has enriched picturesque scenery and tranquil ambiance. It is a hidden gem completely off the radar to local and international tourists," says Mzee Zonga.

But Mzee Zonga is not here on adventure. He is a turtle monitor who is out to protect and raise awareness of the threats to sea turtles with conservation as his backdrop jewel.

Sea turtles serve as guardians of the ocean, playing a vital role in maintaining the health and balance of marine ecosystems.

Sea turtles are considered a flagship species, playing a critical role in Kenya's marine ecosystem, as well as a tourist attraction.

Illegal harvesting, habitat encroachment, and pollution are only some of the things sea turtles are fighting against to stay alive.

Mzee Zonga, who is in his early 50s, is an ideal tour guide for our mission as he is a converted turtle poacher who is now

"I was once a turtle poacher but today I'm a reformed turtle monitor. Turtles are endangered species as they are slaughtered for their eggs, oil, meat, skin, and shells. Sea turtles suffer from poaching and over-exploitation. They also face habitat destruction and accidental capture — known as bycatch — in fishing gear," said Mzee Zonga.

Bycatch is the incidental capture of non-target species when fishing.

In partnership with Africa Climate and Environment Foundation and the fishing communities, Mzee Zonga protects the turtles and rescues them from net entanglement.

Outside Funzi Island, turtles face another survival challenge due to rapid development along the beach in areas like Diani Beach which is a popular tourist destination.

"This development is putting pressure on nesting grounds and that is why our foundation has invested a lot in training locals as turtle monitoring unit and Mzee Zonga is one of the beneficiaries," says Neville Agesa, the chief executive officer of the Africa Climate and Environment Foundation.

"Turtles are endangered species. Development along the beach line and poaching are reducing their nesting grounds. Watersport along the beach is also a threat to sea turtles as they are hit by speeding motorboats. Human beings are the biggest threat to turtle existence today," adds Agesa.

"In 2022 about 50 turtles were killed through boat accidents, fishing nets, and poaching. Unfortunately, mortality figures are climbing steadily," he says.

Agesa says their work is aligned to Sustainable Development Goal (SDG) 14 which is about conserving and sustainably using the oceans, seas, and marine resources.

According to the UN Sustainable Development Report 2023, healthy oceans and seas are essential to human existence and life on Earth.

Out of the five species documented as occurring within Kenyan waters, two are critically endangered while three are endangered under the International Union Conservation of Nature (IUCN) red list.

Some of the sea turtle species along Diani Beach and other coastal regions include leatherback, hawksbill, and green turtles.

The green turtles – the most common species, are frequently reported to nest along Kenya’s coastline and are also among the most exploited species, leading to a drastic decline in their population.

At the same time, Agesa said that increased plastic pollution in the ocean is harmful to sea turtles as they are choked to death by plastic waste thrown into the sea.

“Plastic is a major problem to the survival of sea turtles. We have discovered harmful plastic materials in the stomachs of the turtles. We work with youth and other organisations in beach cleanups to reduce the number of plastic materials thrown into the sea,” says Agesa.

The foundation also responds to turtle mortalities, rescues stranded turtles in fishing nets, and works closely with Kenya Wildlife Services (KWS) to conduct patrols along the beach and islands.

Neville says the foundation has helped to teach fishermen how to rescue and resuscitate turtles found accidentally caught in fishing gear, and then to release them safely back into the sea.

“Such efforts are critical as they show that fishermen play an important role in marine turtle conservation and as a foundation, we are keen to support them continue to create education and awareness opportunities among fishing communities in the coastal region,” said Agesa.

Photo Credit: Francis Mureithi



Mzee Bakari Zonga points to where turtle lay their eggs.

The foundation also targets schools in the coastal regions and raises awareness of the value of protecting sea turtles and marine life.

“Our objective is to stop the decline of sea turtles and work for the recovery of the species. We work to secure environments in which both turtles and the people that depend upon them can survive. We engage the boat owners, fishing communities, and students to protect them because they attract tourists and boost the coastal region economy,” said Agesa.

According to WWF-K other deadly threats at every life stage of sea turtles include illegal trade and direct consumption of meat, eggs, shell, leather, curios, and habitat loss which include uncontrolled coastal development that destroys or disturbs nesting beaches.

Turtle hatchling is also affected by climate change which increases global warming and could skew sex ratios, resulting in more females.

**The government is committed to expanding marine protected areas to 30 percent by 2030.**

According to a new report by WWF and Sky Ocean Rescue over 250,000 turtles die after being caught in fisheries around the world annually.

WWF is urging governments to support the adoption of Remote Electronic Monitoring with cameras (REM) in order to improve accountability across fisheries and for addressing the urgent problem of wildlife bycatch across our oceans.

As a party to the Convention on Biological Diversity, which Kenya is a signatory to, the government is committed to expanding marine protected areas to 30 percent by 2030.

KWS Board of Trustees chairperson Lt Gen Walter Raira Koipaton warns that sea turtles face an uncertain future due to their unsustainable harvesting and a host of other challenges, which are pushing several sea turtle species to the brink of extinction.

“We must make deliberate efforts to reduce the proliferation of single-use plastics, which pose a significant threat to sea turtles. The plastic bags used to hold tree seedlings should be substituted with coconut husks as an alternative, as they are not dangerous to sea turtles,” advised Lt Koipaton.

KWS acting Director General Dr Erustus Kanga says to keep sea turtles safe we must fight plastic pollution. The DG revealed that approximately eight tonnes of plastic are dumped in our oceans annually.

Photo Credit: Diana Wanyonyi



Turtle eggs buried for hutching in Mamburi. Volunteers now patrol the coastline, to ensure their safety.

## From poachers to turtle conservationists: Kilifi fishermen's turnaround tale

By Diana Wanyonyi | wanyonyidiana@gmail.com

For over a decade, Sammy Kenga has cast his nets in the Sabaki area along Kenya's Kilifi County coast, once known as a notorious poacher of turtles for food and profit. Reflecting on his past, Kenga admits to catching turtles for personal consumption and selling their meat to villagers, considering it a routine practice.

However, a pivotal moment at an environmental forum changed Kenga's perspective, marking a turning point in his life. He became an advocate for turtle conservation, now actively involved in protecting and championing the survival of these endangered species.

Teaming up with Francis Nyale, another former turtle poacher turned conservationist, Kenga now volunteers to

*In 2020, we were hard hit because we lost the highest number of turtles. On postmortem, it was discovered that the plastics they consumed killed them.*

**- Daniel Masha, manager, Marereni Biodiversity Conservancy, Diani**

patrol the coastline, ensuring the safety of turtle eggs. He emphasizes the importance of proper burial, safeguarding the eggs from ocean tides, floods, and both human and animal predators.

Kenga and Nyale are committed to educating their community on the significance of protecting turtles. Nyale shares his transformation, saying there is need to inform others about the importance of letting turtles live undisturbed.

In addition to poaching, plastic pollution poses a significant threat to turtles in the region. Marereni Biodiversity Conservancy (MABICO), a Community-Based Organization focused on Sea Turtle Conservation, reports that over 200 turtles have died in the past three years due to plastic waste in the area.

Daniel Masha, MABICO's manager, expresses devastation over the sudden deaths and underscores the community's concern. The organization addresses the issue through various initiatives, including nest monitoring, beach cleaning, and mangrove plantation, all contributing to marine environmental conservation.

"In 2020, we were hard hit because we lost the highest number of turtles. On postmortem, it was discovered that the plastics they consumed killed them. The plastics were found entangled in their intestines," he explains.

Masha, who works together with Kenga and Nyale, added that the plastics are brought to the sea by holiday makers and some debris from neighboring countries.

"Wastes reach our area from far and wide having been washed by waters from upcountry and overseas. We used to collect a ton, but the debris has gone down due to our concerted weekly beach cleanups," he said.

Masha pointed out that some of the threats facing the turtles are humans and or animals stepping on the eggs. Pollution and diseases are also among top killers of turtles.

"In Kenya, we have five turtle species, with only one herbivorous type, while the remaining four are carnivorous, feeding on marine animals such as jellyfish.



**Scientifically, it's estimated that only one in 1,000 sea turtle hatchlings survives to adulthood.**

Unfortunately, the resemblance between plastics and jellyfish poses a significant threat, as turtles struggle to differentiate between the two. Consequently, they often ingest plastic, leading to fatal consequences," explains MABICO's manager, Daniel Masha.

He says turtles also face, a tumor-causing disease called Fibropapillomatosis. This ailment is linked to liquid waste pollution discharged into the oceans, primarily from coastal industries.

A female turtle has recently laid 156 eggs, meticulously buried with the assistance of reformed poachers Kenga and Nyale. Scientifically, it's estimated that only one in 1,000 sea turtle hatchlings survives to adulthood.

Masha acknowledges the dangers the hatchlings encounter on their journey to the ocean, including threats from birds and ghost crabs. The conservancy actively intervenes to protect them during this vulnerable period.

Marereni Biodiversity Conservancy conducts weekly beach cleanups, engaging volunteers, local villagers, and stakeholders, successfully removing over one ton of plastic waste from the coastline. The encouraging news is that the amount of collected garbage has significantly decreased.

Peninah Malonza, Kenya's Tourism, Wildlife, and Heritage Cabinet Secretary, spoke in Mombasa during the unveiling of the sea turtle conservation protocol, including a beach cleanup exercise along the Indian Ocean shores. Malonza said the adverse impact of plastic litter on sea turtles, highlighting them as flagship species critical for ecology, culture, and tourism. She announced government initiatives, such as gazetting turtle nesting sites as conservation

areas and reformulating a national sea turtle recovery action plan. Malonza proposed exploring Important Marine Turtle Areas (IMTAs) to ensure comprehensive protection against sea turtle extinction.

Asma Awadh, the Coastal Kenya Programme Manager for the World Wildlife Fund (WWF), highlighted their ongoing efforts to train numerous organizations in sea turtle conservation. Collaborating with the Kenya Wildlife Service, they developed a nationwide protocol for turtle conservation.

Awadh expressed concern about human-related challenges, including poaching and encroachment on nesting spaces along the shores, leading to a decline in turtle populations. The proliferation of beach hotels and increased human activities on the beach are encroaching on the crucial nesting spaces, posing a threat to turtle populations.

Dr. Mohamed Omar, Head of Marine and Conservation at the Wildlife Research and Training Institute, said that turtles are protected by wildlife laws, and Kenya has signed treaties with other African countries for their conservation.

He said we need to preserve beaches without excessive lighting or fencing, as turtles return to the same place they hatched after 25 years.

Dr. Omar noted that turtles have been traditionally used as food, with beliefs that they possess health benefits. He stressed the urgency of protecting beaches to ensure the survival of turtles, pointing out that areas with lights deter nesting.

He also noted that turtles migrate to as far as Mozambique and Mauritius, and advocates for turtle projects as a vital strategy for safeguarding sea turtles and coastal ecosystems.

Deputy Marine Park Warden in Mombasa, Saidi Shee, credited community sensitization and awareness for contributing significantly to marine life conservation. Shee also called for proper waste management as a crucial factor in saving marine life, especially sea turtles.

Photo Credit: Diana Wanyonyi



**A volunteer removes dry mangrove debris near the turtle nest in Mamburi in Malindi.**



# Man on a mission to rid Indian Ocean of plastic waste

By Francis Mureithi | mureithifrancis1964@gmail.com

**A**s Atty Pye steps into one of the beachfront hotels on the South Coast in Mombasa, one may easily mistake him for an international tourist.

He heads to the reception and tells the receptionist, "I'm here to collect trash."

The shocked receptionist refers him to the hotel manager. After a lengthy discussion, the two emerge shaking hands before getting down to business.

That is a typical day for Pye, 41 a man on a waste collection mission in the entire coastal City.

Pye is seeking to combat climate change and improve marine conservation by creating awareness among hotel owners so that they can reduce the impact of waste from their businesses.

"I try to find ways to utilise waste from hotels to reduce its impact on the ocean. We do crucial tasks like cleaning the beach of harmful plastic material. We do that every day," said Pye.

Pye has a team of young people who remove plastic from the ocean and transform it into cool and useful new products using machines.

"We use a plastic extruder and shredder to recycle plastics from the ocean into curios and glass stands which we give to visitors. Our objective is to create value from waste. The waste we collect from the ocean, isn't waste anymore. We see it as treasure," explained Pye.

Pye, a sustainability expert said his team separates the waste they collect from the ocean into 13 different materials including plastic, glass, metal, and nylon.



Photo Credit: Francis Mureithi

**Atty Pye, a sustainability expert shows some of the plastic and glass waste products he collects from the Indian Ocean in the South Coast to reduce ocean pollution.**



Photo Credit: Francis Mureithi

**Pye: Marine plastic pollution may be costing the world economy trillions of dollars every year.**

"We do this deliberately because we have an organic farm where we grow vegetables. We feed our leftover food

to our chicken that are reared for eggs. By doing this, we cut on expenses in our business," said Pye.

For Pye, the ultimate goal is for businesses at the Coast to embrace a fully circular economy and go green.

“We’re rooting for a circular economy to realise the Sustainable Development Goals and Kenya’s Vision 2030.”

Though what Pye is doing is just a drop in the ocean given the scale of plastic waste pollution globally, it is worth the effort.

According to the World Economic Forum, there are 75 to 199 million tonnes of plastic polluting oceans globally.

Interestingly, this is a result of humans recycling only a paltry nine per cent of plastic waste and dumping 10 million tonnes into the oceans each year.

Sustainable waste management experts warn that if the world continues on this path, the annual flow of plastic into the ocean could triple by 2040.

The largest share of plastic, which is more than 80 per cent that enters the oceans, comes from rivers in Asia. In 2020, around five million tonnes of plastic waste was traded globally.

The world generates around 350 million tonnes of plastic waste per year. That means that around 2 per cent of waste is traded.

“Marine plastic pollution may be costing the world economy trillions of dollars every year because it affects fisheries, coastlines, tourism, marine life, and the food we eat,” said Pye.

According to Kenya Marine and Fisheries Research Institute (KMFRI) Director General James Njiru, the institute’s findings show that 37,000 metric tonnes of plastic get into the Indian Ocean annually. This has caused the death of marine animals such as fish and turtles as a result of suffocation from plastics.

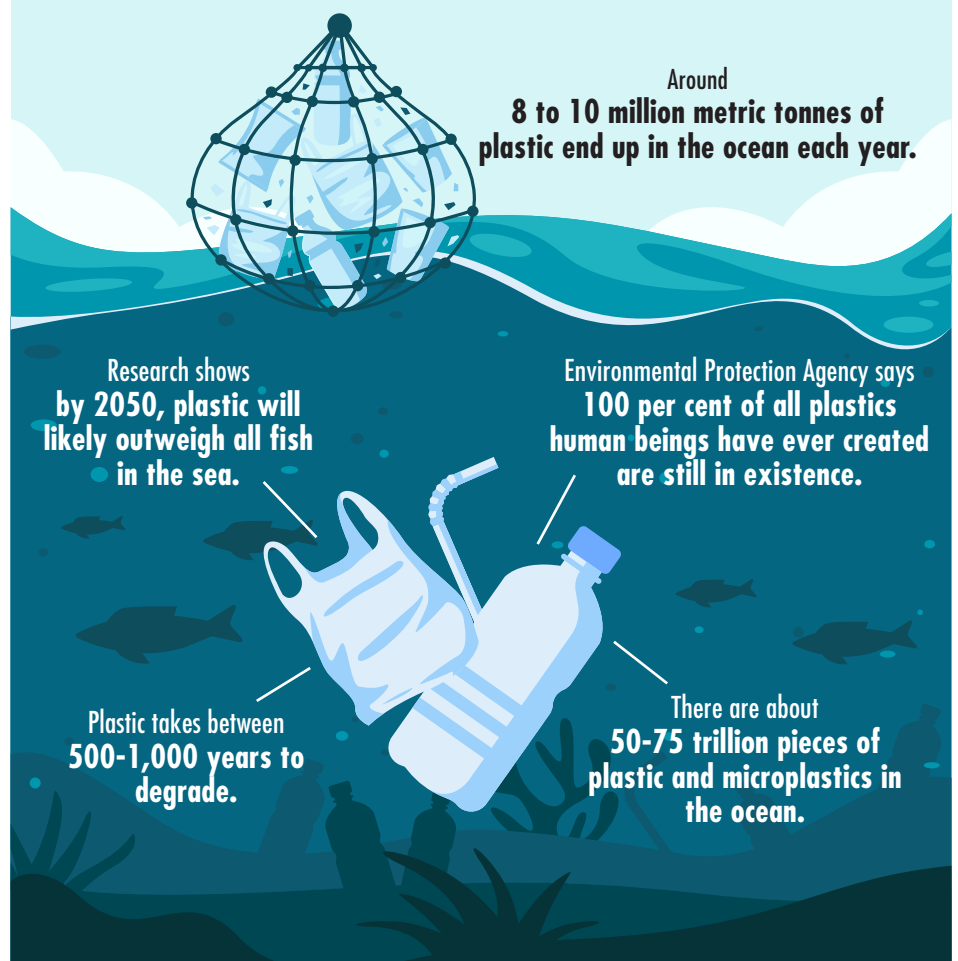
Pye has been working to end ocean pollution for the last seven years and is not about to call it quits.

Photo Credit: Francis Mureithi



A worker converting plastic and glass waste into curios and other products at an extruder unit at Diani in South Coast to reduce ocean pollution.

### INFOGRAPHICS PLASTIC POLLUTION:



# How communities are empowering women to engage in the blue economy

By Ruth Keah | rkeahkadide@gmail.com

In the coastal village of Kipini in Tana River County, Joyce Mramba, 55, has become a household name among the fishing community. Her mission is clear: to empower women and raise awareness to ensure they benefit from the blue economy and transform the lives of many in the predominantly Muslim community.

Joyce, the coordinator of Kipini Tuna Women in Fisheries, said it was taboo for women to engage in fishing activities along the Indian Ocean. In a community where poverty is rampant, many women resorted to fish value addition, often leading to a perilous trade of exchanging sex for fish with the local fishermen.

"If you didn't have a man, it was a big challenge. Women had to engage in sex for fish. That's what I saw and decided to start empowering women," she said.

However, she said changing the narrative wasn't easy. Joyce embarked on a journey of creating awareness by organizing community gatherings and engaging with members. She emphasized the importance of including women in fishing activities and highlighted the health risks associated with the practice of exchanging sex for fish.

"I am happy to say that the mentality of sex for fish is not there anymore. Now we can fish, come back with our catch, and engage in value addition, despite the challenge of inadequate fishing gear. This has not only improved our daily earnings but has also enhanced our livelihoods," she said proudly.

Since she began her campaign in 2012, the Kipini Tuna Women in Fisheries group has grown from five to 35 members. Most women are actively participating in prawn fishing earning up to SH5, 000 (USD 31.2) per day.



Photo Credit: CANCO

Members Of Bodo Beach Management Unit benefited from a training on empowering women to engage in fish trade.

From 2012 until now, women have emerged as vibrant contributors to ocean activities, a transformation attested to by Habiba Dida, the Secretary of the Kipini Tuna Women in Fisheries. She engages in both fish value addition and direct fishing activities.

Habiba recounts her decision to engage in fishing, a choice driven by the challenges she faced in obtaining fish from men at the ocean.

"I used to buy fish, fry them, and sell them. However, boat owners weren't providing us with fish unless certain favors were extended. That's when we made the decision to take matters into our own hands and venture into the ocean for fishing," she explained.

This shift she said has proven immensely beneficial for her.

*Now we can fish, come back with our catch, and engage in value addition.*

**- Joyce Mramba,  
Coordinator Tuna  
Women Group**

“Engaging in ocean activities has significantly increased my daily earnings. I’ve been able to provide education for my two girls, and through diligent savings, I’ve acquired around 15 pieces of wood. My plan is to construct my own boat, which I’ll use for fishing in the ocean. Whatever I harvest will come directly to me,” she said.

Somo Mohammed, the Chairman of the Indian Ocean Water Body Network, oversees 99 Beach Management Units along the coastal region and drives a transformative agenda for gender inclusivity in the blue economy space. Under his leadership, he said the implementation of the gender rule aims to ensure full representation of women, marking a significant stride towards equality and empowerment.

“We have fully engaged women, and now we see them as boat owners. Boats proudly bear female names, indicating ownership by women. This is a remarkable achievement that was absent before,” he emphasizes.

He said the expanded role of women in the blue economy is evident as they actively participate in prawn and octopus fishing, as well as engage in octopus fishery closures to optimize yields.

Octopus fishery closures prohibit fishing activities in a designated area for a specific period, providing protection and conservation measures for marine life and habitats leading to increased yields and more catch for fishers.

Mohammed highlighted that this initiative has empowered women to actively contribute to their families, relieving men from the sole burden of providing for the household.

Hadley Becha, the chairman of Tuna Fisheries Alliance of Kenya (TuFAK) a network of Civil Society Organizations, fisher associations, NGOs, the private sector fishery industry, said despite many post fishing activities being done by women, their voices and contributions in the sector have not been heard or seen. He was Speaking at a workshop on broadening stakeholder engagement for effective advocacy towards promoting sustainable blue economy and fisheries



Joyce Mramba, Coordinator Tuna Women Group says women’s involvement in fishing has improved their daily earnings and enhanced their livelihoods.

## Empowered women have actively engaged in the blue economy, demonstrating their capacity to excel in such roles.

development in coastal Kenya, which brought together stakeholders from the county and national government, NGOs, fish trader associations, beach management units and academia,

Becha stressed the importance of reevaluating or eliminating outdated cultural values that may hinder women’s participation in various activities, including fishing. This shift is essential to enable them to actively contribute to providing for their families and enhance their overall livelihoods, working hand in hand with men.

“Unlike research conducted in Lake Victoria, there hasn’t been a comprehensive study to determine the prevalence of sex-for-fish practices here on the coast. It’s possible that such activities are happening discreetly,” he explained.

John Kareko, a marine expert, acknowledged that there has been a noticeable change in the industry, with women now actively included and a growing inclusivity even in fishing leadership roles.

“If we include everyone, it will also help us speak in one voice. When we advocate for environmental conservation alongside fishing activities, women, youth, and men will all comprehend the importance. However, if our focus is solely on men, women and youth might feel excluded, making it challenging to establish effective breeding grounds for fish,” he added.

He highlighted the positive trend within women groups like Kipini Tuna Women in Fisheries and Bamburi Beach Management Units where women are actively participating, even in leadership roles. According to him, this indicates a shift in perception, demonstrating that people are increasingly recognizing and believing in the capability of women to lead in fishing groups.

“We have also witnessed NGOs empowering women on how to actively engage in the blue economy sector. The tangible results are apparent, as many women have demonstrated their capability to excel in their roles,” he concluded.

# Conservation groups up against poaching along Kenya's coastline

By **Kemunto Ogutu** | healthjournalist3@yahoo.com

Photo Credit: Francis Mureithi

About 67 km from the bustling Mombasa city, sits the calm picturesque Funzi Island. On one side of the island, a paradise beckons with its sun-kissed beaches and swaying palms.

But a stark contrast emerges on the other end, where a dense mangrove maze conceals an illegal activity that jeopardises the very soul of the island— turtle poaching.

But there is grace to this story. Amidst this gloomy realm, a beam of hope shines brightly. Several marine conservationists have ventured out fully to protect these vulnerable creatures. They hope that their unwavering vigilance will safeguard the island's hidden sanctuary and keep the poachers at bay.

Bakari Mshamanga Zonga, a resident of Funzi Island, works as a turtle monitor at Shepshed Beach, one of the archipelago's beaches. Recounting his journey in turtle conservation, Zonga confesses that he was once a lover of turtle meat.

"I learned of the benefits of turtles from the media and government officials and have since taken an interest in turtle conservation," he says.

Zonga says the Shepshed Beach boasts the highest number of breeding nests, thanks to its proximity to the ocean.

"Turtles are slow-moving creatures. When the tides are high, they can easily access this beach to lay eggs and afterwards take less than an hour to return to the ocean," he says.

However, he laments that the main challenge against his conservation efforts is increased poaching activity.

"It saddens me when I hear that someone has killed a turtle."



**Neville Agesa** the chief executive officer of Africa Climate and Environment Foundation displays the bones of a turtle probably killed by poachers.

He reveals that the ocean tides inform his daily schedule.

"During the neap tides, I wake up at around 5am and head to this beach. That is the time that many turtles make their way to the nesting sites."

In the neap tides, the ocean's waves are much weaker, a phenomenon that provides the optimal environment for turtles to get ashore for their nesting season. However, he says many fishermen are aware of the ever-changing tides and poachers often take advantage of neap tides to capture these endangered species.

*When I get to the beach and find a poacher, our difference in ideals poses a threat*  
- **Bakari Zonga,**  
**a turtle monitor**

*This year, we have recorded eight turtle deaths, which equates to eight lost generations.*  
**- Neville Agesa, the CEO of Africa Climate and Environment Foundation**

"During these seasons, I strive to be here early in the mornings so that I prevent poachers and safeguard the eggs," he says.

Zonga discloses that between June and August, he recorded eight deaths of turtles. While three of them were poached and killed at the nesting site, he says the other five were washed ashore and had died from boat strikes and other causes in the ocean. "When I receive a dead turtle, I measure its length and width, then proceed to investigate its cause of death," he says.

While his job of five years has been fulfilling, he admits that it takes great sacrifice to be a turtle monitor.

"My life is sometimes threatened by poachers. When I get to the beach and find a poacher, our difference in ideals poses a threat since I am here to prevent them from poaching, while they are hell-bent on slaughtering the turtles."

This he says affects his social interactions since some of the poachers are also his neighbours in his village.

Despite its challenges, Zonga takes great pride in his work since it improves tourism in the area and sensitises his community on the benefits of turtles, hence improving biodiversity. He strives to pass the information down to the youth and even visits schools to teach the importance of turtle conservation.

For years, the global turtle population has been on a steady decline. While the Indian Ocean boasts of five predominant species, the International Union for the Conservation of Nature (IUCN) warns that these turtles may face extinction if proper conservation efforts are ignored. In its Red List of Threatened Species, IUCN flags Hawksbill turtles as critically endangered, Green and Loggerhead turtles as endangered, and the Olive Ridley and Leatherback turtles as vulnerable.

Neville Agesa is a conservationist and the CEO of Africa Climate and Environment Foundation; a youth-led organisation committed to tackling three planetary crises: biodiversity loss, climate change and pollution.

Agesa recalls how in 2022 when advocating against the illegal killing of aquarium fish, he was threatened at gunpoint. The ordeal traumatised him, forcing him to abandon his conservation work for a while. Unable to keep his environmentalist passion in check, he decided to take a security training course for his safety and ventured back into the risky anti-poaching engagements.

Today, he is in charge of seven anti-poaching community groups across Kwale County.

According to Agesa, Funzi Island has three nesting beaches, which are all close to the dense mangrove forest. This, he believes, makes the area a hotspot for illegal poaching activities.

"So when a poacher finds a nesting female by the beach, he turns it upside down, drags it into the bushes, where he kills it," he says.

At one of the notorious turtle poaching hotspots is a decaying carcass of a huge turtle they had earlier discovered.

**Diani Turtle Watch notes that human activities are the main cause of turtle endangerment. That is why Diani Turtle Watch was founded in 2012.**

"This year, we have recorded eight turtle deaths, which equates to eight lost generations."

Agesa stresses that the poaching trend is worrying, especially at a time when the world is grappling with biodiversity loss. To combat the decline in turtles on the island, Agesa is involved in various anti-poaching efforts.

"During the anti-poaching patrols, we walk in a diameter of 10 metres from the nesting beach, looking for the remains of poached turtles. Whenever we get to a site where there is a turtle carcass, we record its GPS coordinates, weigh the carcass and determine the gender of the turtle that has been killed," he explains.

The team also establishes whether the turtle meat is missing from its shell and then tries to determine what direction the poachers might have taken. However, he says, this feat is challenging owing to the island's vastness. Despite its massiveness, Funzi island has only one monitor, Zonga, who monitors a 10 kilometer-stretch.

Agesa says they work with the Kenya Wildlife Service (KWS) intelligence team to track and capture poachers.

"We have seen a decline in poaching since April 2023 and we hope that the trend will go on," he says.

While anti-poaching patrols are a paramount part of their job, Agesa swears by community sensitisation as the key to combating turtle poaching. Their primary focus is educating children and the youth across all education levels from primary school to tertiary institutions.

"We are looking forward to introducing an ocean literacy program that will bring young people to the ocean and practically teach them the fundamentals of turtle conservation," he reveals.

Forty kilometres away from the island, in Diani, Halima Shilingi coordinates a team of young conservationists in Diani Turtle Watch. Armed with passion for conservation and a Master's degree in Marine Sciences from the University of Dar es Salaam, she is a critical cog in turtle protection in the tourist-rich town.

Photo Credit: Francis Mureithi



**Mzee Bakari Zonga, a turtle monitor at Funzi Island, shows where turtles lay their eggs.**

Shilingi is glad to be among the few women in marine and ocean sciences. She also appreciates the opportunity to work with young people whenever they visit Diani Turtle Watch. She believes that the field of environment and conservation needs more women.

“Women are often passionate about their work and when one does conservation work passionately, your efforts will run smoothly.”

According to her, there are many opportunities in the blue economy sector. Contrary to common belief, the industry is not just about fishing.

“An example is photography. We have people whose main job is venturing into the ocean to document marine life,” she shares. “The ocean is wide with many new species being discovered each day. The ocean is at our doorstep yet we are not utilising it as we should.”

She particularly urges the youth to get involved in conservation and marine sciences. They should not just focus on fisheries but also establish where their passion lies, and then find a way to forge it into a career in the ocean.

Dempsey Mai, the project manager at Diani Turtle Watch notes that human activities are the main cause of turtle

*The biggest threat according to our statistics is boat strikes from fast-moving water sport vessels.*  
- Dempsey Mai,  
project manager at  
Diani Turtle Watch

endangerment. That is why Diani Turtle Watch was founded in 2012. As a popular tourist destination, Diani Beach is abuzz with tourism activities that often interfere with the turtle nesting sites. To counter this, Mai says they partner with beachfront property owners to set aside nest relocation sites on safer ground.

“The biggest threat according to our statistics is boat strikes from fast-moving water sport vessels. Turtle poaching for meat and its products is also a constant threat we are battling,” he says.

Mai points out that ghost nets left or forgotten in the ocean by fishermen also impede their efforts by trapping turtles. Without timely intervention to free the turtles, they end up perishing by starvation or from the injuries that the nets inflict. He explains that they try to mitigate the threats by creating awareness through their turtle information centre.

To reduce turtle mortality, Mai recommends the use of turtle excluder devices (TED), which prevent fishermen from accidentally catching turtles in their nets. He also urges adherence to banning and compliance laws guiding fast-moving water vessels and urges international governments to pass such laws in their countries to safeguard marine ecosystems.

On environmental law, Agesa highlights the need to bridge the gaps in policies that crop up from the underrepresentation of indigenous people in conferences and other engagements where conservation issues are discussed. He notes that often when policies are passed at national levels, the implementers do not follow them through to the grassroots levels, hence rendering the policies useless.

# Salt of the earth: Saving vital mineral licks that support biodiversity

By Benjamin Nyagah | muneneb775@gmail.com  
and John Muchangi | jomunji@yahoo.com

**W**henever Solomon Ileri, 80, goes to quench his thirst at the slow-seeping, salty water springs known as the Gogo Salt Licks, he retraces a path his ancestors took hundreds, probably thousands of years ago.

The founder of the Embu tribe – Mwenendega – had taken out his cows to lick the salty waters of Gogo. There he met his wife Nthara, and a tribe was born.

The account, given by historian Prof Mwaniki Kabeca in his book *Embu/Mbeere Historical Texts*, demonstrates the central place of the salt lick in the lives of people and animals in this community. There would be no tribe without the salts. There is archaeological evidence such spots drew people, birds and animals from long distances to lick the minerals and supplement their nutrition.

## Most wild animals no longer visit the salt lick, known as Munyu in Kiambu, because of the fencing of the nearby Mt Kenya Forest.

However, most of these salt licks have disappeared. The historic Gogo is among the few remaining spots in Mt Kenya region with natural deposits of mineral salts. But that may not be the case for long.

The salt lick, located near Mukuuri Township, about 37 kilometres from Embu town, covers about three acres, now reserved for community use.

However, Ileri, who has lived near Gogo all his life, says it has deteriorated compared to the past when the land had

several salty springs, accommodating livestock and people from all the surrounding villages.

“We hardly graze our livestock here at Gogo the way we used to, this is because the salt lick is in a poor state. The springs were many, but due to soil erosion the majority are covered,” he said.

Most wild animals no longer visit the salt lick, known as Munyu in Kiambu, because of the fencing of the nearby Mt Kenya Forest. However, a wide variety of birds still fly hundreds of kilometres to the area and dik-diks from the nearby Kirimiri Forest, also come at night.

Ileri said the number of tourists visiting Gogo has also dwindled because there are few wild animals to see.

“People from various destinations used to visit this area, something that used to be so productive to us since we could sell them fruits and other farm products,” he added.

Photo Credit: Benjamin Nyagah



Tharu salt lick in Meru, where elephants get their minerals.



Suleiman Nyaga walks about four kilometres from his Kathande village twice a month to drink the Gogo mineral waters that he credits for his strong, healthy body.

He is about 50 years old and does not remember ever falling sick. He attributes this to the salty waters.

"I would also request the County Government of Embu to protect this area to ensure the salt lick is in a good state. This is a rare resource and neglecting it would leave us regretting later," Nyaga said.

"High consumption of the mineral lick will solve more health problems and the county government will give the resource health and also tourism approach," he added.

David Adede, a geologist, explained there are different types of natural salt licks.

Underground salt deposits can be exposed at the surface through erosion or geological activity. Rainwater then dissolves the salt and carries it to the surface, forming salt-rich soil or exposed salt deposits.

For mineral springs, such as Gogo, water flows through underground rocks, picking up dissolved minerals.

"When these mineral-rich springs reach the surface and evaporate, concentrated mineral deposits are left behind," said Adede, who works with Rock Link Geological Consultants Ltd.

He said local climate patterns play a crucial role in the formation and persistence of salt licks. In arid or semi-arid regions with limited water, high evaporation rates concentrate salts in specific areas, such as depressions or dried-up water bodies.

"Seasonal rainfall or flooding events can contribute to the formation of temporary salt licks by washing salts from surrounding areas and depositing them in lower-lying regions. These climatic factors greatly influence the concentration and availability of salts, attracting herbivores in search of essential minerals," he said.



Photo Credit: Benjamin Nyagah

**Suleiman Nyaga quenches his thirst with the mineral, salty waters of Gogo springs that he credits for his good health.**

There is also another type. Some plants accumulate salts in their tissues or excrete them near their roots. Over time, these salt-rich plant residues contribute to the formation of salt licks.

"Herbivores, seeking essential minerals, may preferentially graze or congregate in areas with higher salt concentrations, further enhancing the development of these mineral-rich sites," he said.

Adede noted that different natural licks may have varying concentrations of sodium and additional minerals such as calcium, potassium, and trace elements. Which is why some animals travel long distances to specific spots.

*Different animal species may favour salt licks with varying mineral compositions, depending on their dietary needs and physiological requirements.*  
- David Adede, a geologist

"Animals have species-specific preferences and specific habitat requirements when it comes to salt licks. Different animal species may favour salt licks with varying mineral compositions, depending on their dietary needs and physiological requirements," Adede said.

He said herbivores, like deer and cattle, seek out salt licks with high sodium content to fulfil their physiological needs.

"Calcium-rich salt licks support the healthy growth of antlers in male deer. Trace elements found in salt licks, such as zinc, copper, and iron, play a crucial role in various metabolic processes and immune system functioning."

Adede said many salt licks are currently found in forested areas, and when these habitats are destroyed, the availability of salt licks for wildlife can be reduced. Deforestation also alters natural water flow patterns, which can affect the formation and maintenance of salt licks.

"Intensive grazing by livestock can also alter the vegetation composition, reducing the availability of nutrient-rich plants that contribute to salt lick formation. Additionally, the use of chemical fertilizers and pesticides in agriculture can affect the quality and composition of soil and vegetation around salt licks," Adede said.

The geologist also noted human activities such as construction, building roads, settlements, and other infrastructure, can disrupt natural drainage patterns and alter water availability, which can affect the formation and accessibility of salt licks.

“Additionally, the disturbance caused by construction can deter wildlife from accessing or using existing salt licks,” he said.

Kagaari North Ward MCA Muchangi Mwariama has since constructed a road headed to Gogo.

“It is an important resource for Embu people, and for biodiversity, so we need to ensure people and animals can access it,” he said.

Embu County Environment CEC Florence Musyoka said the county government will identify other mineral licks within the county and preserve them.

Musyoka said she will ensure enough trees are planted in areas hosting mineral licks to prevent the drying up of the salty springs during hot seasons.

“I’m in preparation to ensure all the salt licks are identified and protected to ensure they serve their intended purpose and under proper conditions,” she said.

Musyoka said the main challenge facing salt licks within the county is encroachment leading to soil erosion.

“Encroachment is the monster facing these resources. We urge residents engaging in any activities that are endangering the natural resources to stop and contribute to their conservation instead,” Musyoka said.

She said her move is in line with President William Ruto’s target of planting 15 billion trees by the year 2032 to restore forest cover as well as preserve natural resources that require trees for their survival.

“In our mission to plant over 100,000 trees from the President’s directive we want to ensure our natural resources that require trees receive enough numbers,” Musyoka said.

## While some licks in Nyeri County, are already dying up, the story is different for Tharu mineral lick in Meru County, which has been designated as a natural reserve.

Musyoka said Gogo is among the areas she will ensure are restored to restore relationships among wildlife, people and nature.

“We live within nature and that’s why it is our responsibility to offer protection,” she said.

While some licks, like the Matuto salt licks near Kiganjo in Nyeri County, are already dying, the story is different for Tharu mineral lick in Meru County. The area has received consistent protection from the county government, which designated it as a natural reserve.

Located near Tharu Market, about two hundred metres off Ndagene- Nkubu highway, the mineral lick covers about seven acres of shrubs and features several springs producing salty waters.

This is where Muriungi Mutairishe, a 38-year-old resident of Tharu village, likes to spend his afternoons, slowly chewing Muguka (a variant of khat). He washes the juices down his throat with the salty waters from the salt lick.

“We’re grateful to our county government for protecting this land. We have heard of such places being grabbed for other purposes but for this one, we can proudly say it brings relief through its nutritional value,” he said.

The salt lick has four different springs, one of which is used by the general population and the other by the Akurino believers. Another spring has been set aside for livestock and a separate one atop a rock for elephants from the nearby Mt Kenya forest.

“We found the mineral lick here and so it was with our grandparents. We always receive people from different corners of the country. They all come with cans to carry home with them this God-given water,” Muriungi said.

Rose Kinanu, another Tharu resident, attributed the vast development growth within Tharu market to the salt lick, which she said hosts a huge number of guests daily.

“Our market is fast developing due to the finances the guests bring along in exchange for basic commodities,” she said. She says the salt lick has nourished her family for years.

“I use the salt lick to cook every food in my house. I’m lured by its nutritional value, taste and natural scent that comes along,” said Kinanu.

Engineer Jackson Muthamia, the Meru County CEC for Water, Irrigation, Environment, Natural Resources, and Climate Change said the salt lick has played a crucial role in driving the development of this region.

“By protecting it the county government is promoting locally-led developments,” he added.

*This article was produced with support from JRS Biodiversity Foundation and Media for Environment Science Health and Agriculture (MESHA).*

**“We urge residents engaging in any activities that are endangering the natural resources to stop - Florence Musyoka, Embu County Environment chief executive**

Photo Credit: Robert Malala



Diani Turtle Watch Project Officer Demps Imai explains the history of turtle poaching and conservation in Diani, Kwale.

## Kenya's response to protecting sea turtles bears fruits

By Steve Mokaya | [stevewebsmtz@gmail.com](mailto:stevewebsmtz@gmail.com)

**N**eville Agesa, 25, stands between a group of journalists and a bush about the size of a basketball court, 50m from the beach. This is ground zero, the area where sea turtles love to breed and nest.

It is about 5 pm, and rains are competing with the weak evening sun for supremacy. As the waves were slapping the shores and detonating in anger like bombs, we moved a little closer to clearly hear the story.

Unfortunately, this hallowed ground has become a poaching hot-spot for the ancient sea mariners.

"This island is pristine and hidden, thus providing a good cover for the turtle poachers. This year alone, we found eight turtle carcasses on this island," he says.

Funzi Island, he reveals, is a favorite nesting and breeding ground for many sea turtles because it has three small beaches that are close to the ocean. However, poachers, armed with this knowledge, lay in wait for the reptiles and kill them for their rich oil and meat.

The youthful conservationist and CEO of Africa Climate and Environment Foundation shepherds a team of eight turtle conservation cohorts in Kwale County. Their main agenda is to stop turtle deaths and protect the ones that come to the beaches to nest.

One of the groups conducts turtle anti-poaching along the coastline, especially on Funzi Island. During patrols, he and his team walk 10m from the beach for several kilometers searching for turtle carcasses.

"When we get the bodies, we record the GPS coordinates of the area. We also record the type of the turtle killed, and its height and size," he says.

Agesa says that the work is challenging especially because of the huge need for conservationists in the vast south coast region.

He says, "It is hard to find volunteers, especially the young people who can join us to conduct anti-turtle poaching patrols. Currently the whole island has only one person who patrols ten kilometers every day."

Besides the daily patrols, the teams also conduct educational programs for primary and secondary schools in Kwale County.

"We also get students from colleges and universities who come for a one year practical program on turtle and general conservation," he offered.

In Diani town, the South Coast's tourism and economic hub, we meet Dempsey Mai, the project manager at Diani Turtle Watch, a conservation group working in the community to wage war against

turtle poaching and bolster their chances of survival. Mai leads a team of about a dozen young conservationists. He says besides poaching, turtles in the area are killed by boats at sea.

“We have found several carcasses at the shore of turtles killed by boat strikes. We usually carry the carcasses and conduct necropsy to ascertain the cause of the deaths,” he explains.

In their turtle information center, they welcome the general public, and learning institutions to learn the importance of taking care of turtles and what they can do to protect them. They have also engaged other stakeholders to collectively protect the sea creatures.

“We have partnered with the owners of beachfront businesses to set aside areas where there should not be development projects, to allow spaces for nesting and breeding,” he adds. “Sometimes we relocate the turtle eggs to safer places and guard them until they are hatched. We also partner with the KWS to do anti-poaching patrols.”

Away from the South Coast, another conservation group, Bahari Hai, is leading the war against turtle-poaching in the North Coast’s Watamu area. Ochieng Odhiambo a project officer in the NGO said one common reason communities hunt down and kill turtles is poverty, as they strive to find food.

“To counter this, we have introduced alternative means of livelihood to the communities living along the coastline in the North Coast. Some of the alternatives are beekeeping, kitchen gardening and poultry. These are meant to ease the pressure on marine resources,” Odhiambo says.

The Kenya Wildlife Service (KWS) is very intentional with protection of these sea creatures, and has employed several strategies to salvage them from ultimate extinction. In the Mombasa Marine Protected Area (MPA), Said Mohammed, the Warden in charge and Manager laments that turtles, which “existed a long time ago, are today facing unprecedented threats’.

Photo Credit: Francis Mureithi



**Agesa: We usually conduct post-mortems on turtles to determine the cause of the deaths.**

“They have lost their breeding sites and that has really impacted them in terms of reproduction,” Mohammed explains.

He also said that climate change has worked against the endangered sea creatures since their sex is temperature dependent.

“Science has shown that with high temperatures, you are more likely to have female hatchlings. And when the temperatures are cold, you end up having males. Since 1950, temperatures have shown an onward trajectory due to the increase in greenhouse gasses,” he says.

The warden adds that the greatest thing people can do to help turtles is protect their habitats. “Turtles need their three habitats to survive and thrive: foraging grounds, breeding grounds, and their migratory routes,” he explains.

He says that invasive species are a threat to turtles’ breeding and foraging grounds. These are plants and animals that dominate an area at the expense of the entire ecosystem. Most of them are originally not native to that area.

“At the Kenyan beaches, we have two main culprits— cactus and sisals. When you have them at the beach, turtles cannot find their way to their breeding and foraging sites,” he offers.

Mohammed reveals that Kenya has five species of turtles and in its territorial waters. However, only three of them nest in the country. For example, he said, the

green turtles are purely vegetarian. They feed on the seagrass while other species feed on fisheries such as sponges, crabs, or juvenile squids.

He says KWS conducts regular beach clean-ups, and sensitizes people against pollution. They are also involved in the restoration of seagrass and corals, which are a productive ecosystem and turtles feed on fisheries found there.

Their efforts are bearing fruit. Mohammed reports an 80% successful hatchlings annually.

They are able to track turtles using telemetrics (satellite transmitters), and monitor their routes all the way from Kenya to Australia, Seychelles and other places. It is through this method that they identified specific migratory routes.

“We were also able to monitor where they go for foraging. Believe it or not, the turtles that breed in Kenya do not necessarily forage in Kenya. They forage thousands of miles south of Kenya. And the ones that forage in Kenya could have come from outside Kenya. That is the trend that we recently realised,” he offers.

Mohamed says Kenyan law is very strict against poaching of turtles and if found, one can get a penalty of paying a fine of Sh 20m (USD 125,00) or life imprisonment or both. He disclosed that the KWS has arrested some people and that their cases are active in court.

“Others have been convicted and gone behind bars,” he says.

Mohamed said humanity has a great responsibility of protecting these reptiles because they balance the ecosystem.

“For example, the green turtle not only feeds on grass but also on seaweed. So if we don’t have animals such as turtles to keep in check seaweed and seagrass, corals can be overshadowed by fast growing seaweed and algae. We have a very complex ecosystem and turtles are part of that ecosystem. If you try to take out turtles you are more likely to mess up the ecosystem. Turtles are one of the key species,” he says in conclusion.

Photo Credit: Joshua Wambugu



Reef Rangers enjoying dolphins view at the Wasini Channel. They have been spearheading efforts to ensure responsible tourism practices.

## Safeguarding biodiversity through responsible tourism

By Ruth Keah | rkeahkadide@gmail.com

**G**rowing up in Wasini village, Suleiman Kionzo, was molded into becoming one of the prominent boat operators in the Shimoni region. A member of the Wasini Boat Youth Operator and a seasoned tour guide, has devoted 15 years to his profession.

His primary role involves taking tourists from mainland Shimoni to the breathtaking Kisite-Mpunguti Marine National Park. Dubbed the 'Home of the Dolphin,' the Park is located in the Shimoni-Vanga seascape along the southern coast of Kenya.

As the country's largest marine protected area, The park is a beacon of natural wonder, captivating tourists with its unique marine ecosystem, pristine coral reefs, and diverse marine life. Notably, it serves

as a crucial migratory route for majestic humpback whales, and has become a symbol of successful conservation management, earning the prestigious gold-level Blue Park Award by the Marine Conservation Institute for achieving the highest science-based standards for marine life protection and management.

*Most boat operators from this area are not professional tour guides; they simply follow what others have been doing without proper training.*

**- Yvonne Muyia,  
REEFolution Programme  
Coordinator**

Beyond its ecological significance, the park and adjacent locally marine managed areas (LMMAs) play a pivotal role in the local economy, sustaining livelihoods through subsistence fishing and thriving marine tourism activities. The Ministry of Tourism, Wildlife & Heritage annual tourism sector performance report for 2022 shows that the number of tourists visiting the Park has increased from 40,793 in 2019 to 73,922 in 2022.

During low tourist seasons, Kionzo seamlessly transitions into a fisherman. This dual role is common among many boat operators in the area who, like Kionzo, did not pursue formal education in tour guiding.

He, however, acknowledges that some of his colleagues unintentionally contribute to the degradation of the marine ecosystem. Their activities, such as reckless boat anchoring, unguided snorkeling and

diving, pose significant threats to the fragile marine environment, including corals and other vulnerable species. If left unaddressed, these practices could lead to irreversible damage to delicate marine ecosystems.

For this reason, Kionzo was part of a training aimed at empowering tour guides and boat operators with responsible tourism practices. It was conducted by the REEFolution Trust, under the REEF STEWARDSHIP Project supported by the Rufford Foundation.

Yvonne Muyia, the Programme Coordinator at the Trust, emphasized that sustainable tourism seeks to minimize negative environmental impact, support local communities, and offer meaningful experiences for travelers.

"Most boat operators from this area are not professional tour guides; they simply follow what others have been doing without proper training. Our goal is to standardize tourism practices here and help them understand the benefits of sustainable tourism as a viable source of income," she stated.

The training involved 38 participants from various groups, including Wasini Youth Boat Operators, Kisite Community Boat Operators, Kibuyuni BMU, Mkwiro BMU, Shimoni BMU, and Wasini BMU.

*Therefore, we have collectively agreed that every boat must have a code of conduct in place at all times, and all rules must be strictly followed.*

**- Yatin Patel, diving instructor**

Among the trainees was Mohammed Kassim, a member of the Wasini Beach Management Unit and the group's secretary. With 15 years of practical experience in tour guiding in Shimoni, where he takes tourists to Wasini Island and Kisite Mpunguti Marine National Park, Kassim expressed how the training has equipped him with new knowledge on handling tourists professionally.

"We will now approach our work as tour guides with a professional mindset, prioritizing the conservation of the marine ecosystem including the corals. I have learned that by actively conserving the environment, we can attract more tourists, as they like visiting well-preserved places," he shared.

He committed to actively disseminate the knowledge to the group members, educating them on the proper code of conduct when interacting with tourists and guiding them on the appropriate activities within the park.

Abdulaziz Hemedi, the secretary of the Wasini Youth Boat Operators, openly acknowledges that despite his seven-year tenure, he was not aware of certain aspects of boating and was executing some practices incorrectly.

"I wasn't aware of these rules, but now I understand that when I observe tourists breaking regulations, such as stepping on coral reefs, which is prohibited, I will first approach them with a soft warning. If they persist, I will escalate to harder approaches, including reporting the incident to authorities like the Kenya Wildlife Services for necessary action," he explains.

Yatin Patel, a diving instructor from Pilli Pipa Dhow Safaris in Shimoni, said that due to lack of training tour guides are at risk of unintentionally causing harm to the marine ecosystem as they execute their duties.

"Despite the existence of a code of conduct, some guides are not adhering to them. For instance, they take tourists too close to dolphins or allow them to swim with the dolphins, which is strictly prohibited. Therefore, we have collectively agreed that every boat must have a code of conduct in place at all times, and all rules must be strictly followed," he explained, adding that it is their duty as guides to ensure tourists follow the rules and refrain from damaging marine ecosystems.

Corporal Juma Mando, from Kenya Wildlife Services in Shimoni, said the training is a platform to increase awareness of safe, safety and maritime regulations to the boat operators at the different levels.

Photo Credit: Joshua Wambugu



Traditional dhow used for marine excursion to Kisite-Mpunguti Marine Protected Area.

Photo Credit: Captain Nyota



Judy Gona, Lead Consultant at Sustainable Travel and Tourism Agenda. Right, Mohammed Kassim (in white T-shirt), a member of the Wasini Beach Management Unit listening keenly to the proceedings of the workshop aimed at empowering tour guides and boat operators with responsible tourism practices.

“Through this training, I believe the boat operators and BMUs have recognized the importance of honesty. This will contribute to the growth of tourism, as guests will receive accurate information and, in turn, share their positive experiences with others, inspiring more visits to the marine protected areas,” he said.

Judy Gona, the Lead Consultant at Sustainable Travel and Tourism Agenda, emphasized the evolving needs of responsible travelers, hence tour guides to align with the global focus on sustainability. In the context of coastal and marine tourism, she highlighted the challenge of finding responsible guides and sea adventures.

“Travelers today seek guides who understand the stories, values, and cultures of the places they serve, as well as those who demonstrate responsibility to the environment,” she said.

Gona further emphasized that responsible tourism aligns with the 17 Sustainable Development Goals (SDGs), particularly

*“It is important that we all respect and protect life underwater. This is a critical component of our ecosystem and vital to our existence as human being.”*  
**- Judy Gona, Lead Consultant at Sustainable Travel and Tourism Agenda**

addressing SDG number 13, which focuses on protecting life underwater. She urged guides involved in sea activities such as recreational SCUBA diving, dhow safaris, cruises, ships, and snorkeling to respect and protect marine life.

She stressed the significance of preserving the underwater ecosystem, emphasizing that its destruction not only impacts the food chain but jeopardizes the entire biological ecosystem, thereby posing a risk to human lives.

“It is important that we all respect and protect life underwater. This is a critical component of our ecosystem and vital to our existence as human beings,” she concluded.

Joshua Wambugu, the Project Lead for the REEF Stewardship Project said periodical assessment on the knowledge gap and skills among the boat operators and marine tourism guides is critical. He said by understanding their knowledge needs, it becomes easy and convenient to tailor-make experiential learning and knowledge training programmes, particularly on new innovation on marine restoration, responsible tourism, visitor’s experiences and safety.

“Overall, it is great to see positive receptiveness, enthusiasm, and urge by the participants to engage them more, and have periodical interactive training forums that enriches their capacity with knowledge and awareness,” he said in conclusion.

# Meet the chief conservationist leading the protection of sea turtles

Photo Credit: Clifford Akumu



Neville Agesa, a wildlife conservationist and climate change activist during the interview.

By Clifford Akumu | akumu.clifford@gmail.com

For years, Neville Agesa has been mobilising locals to take action for environmental protection. His focus has been marine plastic littering and unsustainable exploitation of marine resources in areas such as Vanga, Shimoni, Waa, Diani, Majoreni, Kinondo, and Funzi in Kwale County.

Agesa, 25, is the Chief Executive Officer at Africa Climate and Environment Foundation (ACEF) a youth-led organisation focusing on mobilising and empowering African youths to take action for climate change mitigation and environmental protection to bridge the hunger and poverty gap.

His mission to document and tackle plastic pollution was informed by the relentless plastic pollution that is putting pressure on the endangered sea turtle species along the South Coast.

*It is now a race against time to protect sea turtles.*  
- Neville Agesa,  
Chief Executive Officer  
at (ACEF)

Besides plastics, the turtles also face human-made physical hazards, climate change, loss of nesting habitat, and commercial fishing that are also pushing them to extinction. Agesa says that sea turtles are necessary for maintaining productive coral reef ecosystems to transport essential nutrients from the oceans to beaches and coastal dunes.

Without them, he says, their ability to fulfil vital functions in ocean ecosystems will only remain history.

"It is now a race against time to protect sea turtles," he noted.

Although there are seven turtle species in the world today, Kenya has only five: the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), Olive Ridley turtle (*Lepidochelys olivacea*), and leatherback turtle (*Dermochelys coriacea*).

On the South Coast are the green turtle and the hawksbill turtle, which are ranked as endangered and critically endangered respectively according to the International Union for Conservation of Nature (IUCN).

Agesa is working with other organisations working on turtle conservation along the coast to change this..

"With the help of Diani Turtle Watch, we have hired ex-poachers as monitors to protect the nesting beaches while we work on changing the community's mindset through capacity building. We teach the locals that a turtle is worth more alive than dead since it's a tourist attraction site," he said.

His commitment to the safety and protection of marine ecosystems, especially sea turtles has seen him brave the early morning and late evening hours on the beach, watching nests for possible hatchlings, protecting nesting female turtles, and excavating to determine success rates of each nest.

Agesa says that plastics pose a great threat to sea turtles while on land and in water. Since turtles consume jellyfish, they sometimes fail to differentiate between a plastic waste and the sea creature.

"When they eat plastics thinking it is food, they become full and do not eat for a long period. This results in starvation on land or sea," Agesa said.

Plastics also pollute the sand, making it unsuitable for turtles to nest on the beaches. A turtle takes 30-50 years to mature to start nesting and has only a life span of 90 years. It nests at intervals of two years apart.



Photo Credit: Clifford Akumu



**A sea turtle hatchlings on its way to the ocean. A turtle takes 30-50 years to mature to start nesting.**

Agesa has formed six marine litter management groups along the coastline that are active and doing litter management in diverse ecosystems along the South Coast marine ecosystem.

“When we lose this population, we will start complaining of biodiversity loss. We are playing our part to make sure we reverse extinction and reduce such cases. And that is why anti-poaching patrols are vital in sea turtle nesting,” explained Agesa.

Through his efforts, Msambweni Turtle Watch, a community of volunteers motivated towards conservation, has come back to life, after years of inaction.

“We have organised underwater and beach clean-up and mobilised hundreds of youths and collected thousands of debris that were sent to the recycling facilities,” added Agesa.

His journey started back in Kakamega when he snuck out of Amalemba Primary School to go on hunting expeditions, targeting birds.

“I accidentally met my father who punished me for making such a mess and later advised me on the importance of wildlife,” he explains.

Although Agesa wanted to become a police officer or game warden, his love for wildlife conservation was so strong that he would occasionally go to his neighbour’s house to watch National Geographic Films.

In 2018, he joined Diani Turtle Watch as a project coordinator under Local Ocean Conservation. In 2021 he was named the first runners-up in the Rhino Conservation Awards 2021 in the best conservation supporter category. He also received the Africa Green Under 40 by Eleven Twelve Foundation Awards in 2022 and recently, the Kwale Environmentalist of the Year Award.

However, his conservation career has not been without its challenges.

“I was at the forefront of fighting illegal poaching of aquarium fish from the Diani-Chale region. I remember one day I was threatened at gunpoint. It was a very frustrating time.” he said.

Getting sea turtle monitors, especially from the youth has not been easy. The entire Funzi Island has one sea turtle monitor that has to cover three beaches.

The underrepresentation of indigenous people during policy formulation is one of the major biodiversity policy gaps.

“We need to create awareness on some of the biodiversity laws through community conservation groups, and community meetings so that the locals are aware of them and can become ambassadors,” noted Agesa.

Photo Credit: Clifford Akumu



**Africa Climate and Environment Foundation conduct a clean up at Mwazaro beach in Diani in Kenya. Marine pollution is one of the biggest threat to sea turtles.**

## PICTURE SPEAK

The Media for Environment, Science, Health and Agriculture (MESHA) with support from JRS Biodiversity Foundation, recently held a science café at Naivasha Raptor Centre on the shores of Lake Naivasha in Kenya's Rift Valley region. The facility serves as a first base for incoming injured birds where initial treatment and housing is provided, as well as longer term care for recovering and permanently injured raptors for public educational display. The Centre receives about 3,000 visitors per year, of whom 1,500 are international tourists.

Photo Credit: James Wakibia



Journalists gather at the Naivasha Raptor Centre's media science café to explore the intricacies of birds of prey and their role in biodiversity.

Photo Credit: Odhiambo David



The Spotted Eagle-Owl (*Bubo africanus*) is threatened with extinction due to the pervasive myths that they are bad omen. Debunking these misconceptions will help in protecting the birds from further harm.

Photo Credit: James Wakibia



Anthony Karinge, education manager at Elsamere Conservation Centre, explains to journalists the importance of the raptors to the ecosystem.

Photo Credit: Rachel Kibui



Shiv Kapila, Director of the Naivasha Raptor Centre, asserts that birds of prey worldwide are facing extinction due to factors like human-wildlife conflict, natural calamities such as wildfires, and electrocution.

## PICTURE SPEAK

Photo Credit: James Wakibia



The Marabou stork (*Leptoptilos crumenifer*) is a large wading bird found in sub-Saharan Africa. It is often considered one of the ugliest birds due to its bald head, large bill, and generally unkempt appearance. Marabou storks play an important role in their ecosystems as scavengers, helping to clean up carcasses and organic waste.

Photo Credit: Odhiambo David



Darcy Ogada, Africa Program Director at The Peregrine Fund, explains that the organisation engages in species-based conservation efforts to safeguard birds of prey. Their approach includes saving habitat, engaging people, addressing threats, and focusing on specific species at risk.

Photo Credit: Aghan Daniel



Participants at the MESHA media science cafe on biodiversity, which explored the importance of birds of prey in biodiversity conservation. The cafe, held in January 2024, was supported by JRS Biodiversity Foundation and implemented by MESHA.

Photo Credit: James Wakibia



The Lappet-faced vulture (*Torgos tracheliotos*) is a prey bird with a wingspan that can reach up to 2.9 meters (9.5 feet), making it one of the largest vultures in Africa. The Lappet-faced Vulture is thought to be the most powerful vulture in Africa. The Lappet-faced Vulture can eat up to 1,450 g (51 oz) of food in one meal. The female will usually lay only one egg, though sometimes she can have up to two eggs in one clutch. The eggs are white with rusty-colored splotches and need to be incubated for about 56 days! Both the male and the female will take turns incubating.


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- Plastic waste could ruin marine ecosystem
- Turning to edible insects for food security in Africa

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**From talk to action: Saving the planet and its biodiversity**


In this issue

- New technologies to restore coral reefs
- Of wild dogs and threats facing them
- Biodiversity captures huge focus in Nairobi Declaration

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- Congress seeks to put people at the centre of effective conservation
- Activists' unique journey to COP 'to amplify Africa's voice'

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- Restoring the only river on Mombasa island
- Kenya's efforts to save the sea turtles bears fruit