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# Mtafiti Monthly

**A PUBLICATION OF KENYA MARINE AND FISHERIES RESEARCH INSTITUTE (KMFRI)**
**@KmfriResearch**

**ISSUE 51**
**AUGUST, 2024**

**BY Jane Kiguta & Brian Isoe**

## New Blue Economy CS Hon Ali Hassan Joho tours KMFRI

Newly appointed Cabinet Secretary for Mining, Blue Economy and Maritime Affairs Hon Ali Hassan Joho, EGH, on Monday August 19 2024 made his first official visit to Kenya Marine and Fisheries Research Institute (KMFRI) shortly after taking up the reins of the ministry.

The CS, a former Governor of Mombasa County, was accompanied by his successor, H.E Abdullswamad Sherrif Nassir, and Principal Secretary of State Department of Fisheries and Blue Economy Madam Betsy Njagi, CBS.

*Cabinet Secretary for Mining, Blue Economy, and Maritime Affairs Hon. Ali Hassan Joho, EGH, alongside Mombasa Governor H.E Abdullswamad Sherrif Nassir, PS for State Department of Fisheries & Blue Economy Madam Betsy Njagi, CBS, and KMFRI Board chair Hon John Safari Mumba at the institute headquarters.*

*Cabinet Secretary Hon Hassan Joho giving his remarks at Dolphin Hall where he addressed KMFRI's top leadership*

Speaking at the Institute, the CS acknowledged KMFRI's efforts in harnessing the Blue Economy, urging the researchers to do more to unlock the massive potential gains of aquaculture and mariculture.

"The Blue Economy is very broad. Mining, tourism and oil extraction are also components of the BE. Stock assessment is critical and investors need this data," said the CS.

While addressing KMFRI top managers, the former Governor said the potential sitting on our waters is enormous and we must put in place plans to create more jobs for our youth, and generate higher revenue, adding that the benefits will reduce overdependence on the exchequer.

"Dependence on the exchequer compels the government to increase taxes," he said, pointing out that it places unnecessary burden on taxpayers.

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The CS, the Governor and the PS also planted commemorative trees at KMFRI headquarters.

Earlier, the CS was warmly received by KMFRI's Director of Socioeconomics Dr Jacob Ochiewo, who was representing Ag Director General, and led to the DG's office for a courtesy call before addressing KMFRI's top managers at the Institute's Dolphin Hall.

Dr Ochiewo delivered a presentation that showcased KMFRI's research milestones and the her contribution to the Blue Economy sector. The Governor welcomed the CS to Mombasa and wished him the best in his new role.

*Director of SocioEconomics Directorate Dr. Jacob Ochiewo giving a presentation on KMFRI's mandate, on behalf of KMFRI Ag Director General .*

On her part, the PS commended KMFRI for her achievements in research, acknowledging the role of Marine Spatial Planning (MSP) in supporting the Blue Economy. She added that there is a need to develop a framework to aid implementation.

The CS and his delegation also toured KMFRI's museum, which houses a herbarium, home to a collection of freshwater and marine fisheries specimens.

*KMFRI museum curator Mr. Justus Andati describing to the CS and his entourage the potential of the blue economy space.*

The museum plays a significant role in supporting and preserving scientific knowledge and biodiversity data.

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**BY David Mwoma & Mary Joseph Edits:** ***Jane Kiguta***

## KMFRI hosts GMES & Africa-funded earth observation training in support of aquaculture

Kenya Marine and Fisheries Research Institute (KMFRI) headquarters in Mombasa hosted a five-day training workshop and capacity building course on Earth Observation (EO) in support of marine aquaculture. The engaging and insightful workshop ran from 5th to 8th August, 2024, and brought together over 25 trainees drawn from KMFRI and Kenya Fisheries Service (KeFs).

The course was convened by the Council for Scientific and Industrial Research (CSIR)'s senior research scientist Dr Marie Smith and Digital Earth Africa to provide participants with the knowledge of where to find and visualize appropriate satellite datasets and products for environmental parameters relevant to marine aquaculture.

This was in addition to practical examples of working with these datasets in both interactive and programming environments.


*Participants display their certificates*

Dr. Smith from CSIR, South Africa, facilitated the sessions. The training was supported by the Global Monitoring for Environment and Security and Africa (GMES & Africa) through the Africa Marine and Coastal Operations for Southern Africa and Indian Ocean (MarCOSIO) consortium, and the Kenya Marine Fisheries and Socio-Economic Development (KEMFSED) Project, under the Marine Spatial Planning (MSP) process.


*CSIR Senior Research Scientist Dr Marie Smith at the training*

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KMFRI is a partner in the GMES & Africa project under MarCOSIO consortium, with KMFRI's Senior Research Scientist Dr Emmanuel Mbaru being the thematic leader- Kenyan Chapter. GMES & Africa is co-funded by the African Union Commission (AUC) and the European Commission.

*Training participants during the sessions*

The workshop was aimed at promoting the exploitation of Copernicus Earth Observation (EO) data, technologies and services in support of sustainable management of natural resources in Africa.

At the end of the training, the trainees came out of the program fully equipped with meaningful insights and expertise in working with Geographic Information System (GIS) remote sensing concepts and programming. Participants were taken through practical experience in finding and accessing appropriate satellites. They used various ocean datasets from different platforms including Copernicus Marine Services (CMEMS), Digital Earth Africa and DUNIA. These platforms availed the trainees with a virtual environment to access, process, analyze, and visualize large ocean datasets using Python (Jupyter notebooks).

Key messages from the training included the ability to develop suitability mapping products for policy decision-making, support for the development of (CIDPs), and provision of advisory in investments within the blue economy sector. The team will also develop webinars for self-paced training for use beyond the training.

*KMFRI Ag Director General Dr James Mwaluma*

KMFRI's Ag. Director General Dr James Mwaluma, while closing the workshop, noted that it was a game changer to advancement being made in the mariculture sector, connoting that the expertise acquired will be key in influencing policy development in the fisheries sector as well as marine spatial planning in the blue economy space. This training marks a significant step forward in enhancing Kenya's capacity to harness EO technologies for sustainable marine resource management.

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**BY Dr David Mirera, Brian Isoe, and Phionalorna Nzikwa Edits: *Jane Kiguta***

## Restorative aquaculture project brings sustainable practices to Shimoni seaweed farmers

*KMFRI researcher with TNC research associate planting seaweed in Mtimbwani, Kwale county.*

Kenya Marine and Fisheries Research Institute (KMFRI) in partnership with The Nature Conservancy (TNC) and other Blue Economy stakeholders in the Coast of Kenya pitched camp in Shimoni – Kwale county to train and equip seaweed farmers with new knowledge and skills.

The partners and the communities completed an eight-day field-based training on Seaweed Best Management Practices in Kenya, which brought together diverse scientists from different areas, including from our neighboring Zanzibar. Zanzibar is famed for advancements in seaweed farming and development of value-added seaweed products.

The training organized by TNC in collaboration with KMFRI and local partners, saw devoted and ready-to-learn farmers drawn from Kijiweni, Changai, and Mtimbwani villages eager to acquire requisite skills and benefit from the training. The training entailed in-person class sessions for three days where the farmers were taken through the history of seaweed farming in

*TNC staff from Zanzibar monitoring lines of already planted seaweed in Mtimbwani.*

Kenya, selection of farmed seaweed species, site selection, significance of Coastal ecosystems such as corals, seagrass, and

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mangroves in seaweed farming; and threats facing the venture.

After the in-classroom interactions, the farmers were taken through practical sessions in the ocean where they were guided on the preparation of double made loop ties, cutting of ropes, and preparation of the tie-ties (small cuttings attached to a line with short lengths of string) in seaweed planting. This was done to equip them with hands-on experience before planting the seeds in three demo farms, to act as pilot projects.

Currently, seaweed farming is typically done on small scale in marine conservation areas, close to mangroves and coral reefs, in the intertidal zones of our waters. Communities living adjacent to the coastline need to diversify from fishing and embrace farming of seaweed to boost and sustain themselves economically.

KMFRI Assistant Director - Mariculture, Dr David Mirera, who was part of those training farmers implored the villagers to embrace seaweed farming, noting that the ocean is big. Its resources have a lot of benefits that haven't been tapped. "We can always go into seaweed farming and capitalize on it as others engage in fishing. From statistics, farming of seaweed has proven to be super productive with numerous benefits; something farmers need to exploit through large-scale farming."

Seaweed farming has often been regarded as a women's affair, totally disregarding the value and contributions men can bring in farming this precious commodity. The training brought together diverse participants regardless of gender and age, with teachers commending the communities for the big turnout.

*Participants of the training session.*

The TNC Interim Director, Mr George Maina lauded the communities for their eagerness to embrace this type of farming. He noted The Nature Conservancy needed to bring on board all experts to ensure maximum support in this journey. "We've seen communities eager to engage in seaweed farming and that is our joy. We have also brought in experts from Zanzibar who have the necessary experience as well as scientists from KMFRI to capacity build these communities on the best seaweed management practices".

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The speakers reiterated that as a country we can produce more products from farming seaweed. The country produced 96,255kg of seaweed last year according to Kenya Fisheries Services (KeFs) Director Dr Patrice Jilani who also intimated that we have the potential as a country to maximize total production.

*Farmers prepare strings for seaweed farming*

The training climaxed with the planting of seaweed in the three demo farms, which will act as pilot projects.

More than 150 lines (three plots of 50 lines each) of tie-tie were planted in each of the three villages namely Changai, Mtimbwani and Kijiweni. More planting to cover a total of 450 lines (9 plots) are planned to take place. The team is expected to visit the farms often to monitor the progress of the planted seaweeds.

**BY Anne Wanjiru, Dr Amina Hamza, Dr Joseph Langat, Fredrick Mungai & Dr James Kairo** ***Edits: Jane Kiguta***

## KMFRI Blue Carbon Unit hosts BlueInvest Africa side event

Kenya Marine and Fisheries Research Institute (KMFRI) Blue Carbon Unit - Mikoko Pamoja - hosted BlueInvest Africa side event, on the sidelines of the 2024 BlueInvest Africa conference held at Diamond Leisure Hotel in Kwale County, Kenya.

The 2024 forum took place on 3rd and 4th July 2024 in Diani, Kenya, and was co-hosted by European Union (EU) in partnership with the Government of Kenya. The event brought together over 200 delegates and investors from all over Africa.

The focus of the 2024 conference was to spotlight transformative projects within maritime and coastal sectors and interior waters, with special emphasis on sustainable innovation, job creation, and marine ecosystem preservation.

KMFRI's top management led by Board Chair Hon John Safari Mumba, Ag Director General Dr James Mwaluma and Aquaculture Director Dr Jonathan Munguti, among other KMFRI participants, attended the forum.

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*Former Blue Economy CS Hon Salim Mvurya, KMFRI BOM Chair Hon John Safari Mumba, KMFRI Ag Director General Dr James Mwaluma, and delegates visit exhibition stand.*

Mikoko Pamoja which is the first community-led project to conserve mangroves through the sale of carbon credits was chosen to host the side event on 3rd July 2024 as part of the event program for Blueinvest Africa.

Currently, Mikoko Pamoja and Vanga Blue Forest (VBF) are the only blue carbon projects that are in full operation in Kenya.

KMFRI in collaboration with partners such as, Edinburgh Napier University, and Association of Coastal Ecosystem Services (ACES) helped develop Mikoko Pamoja, the first ever mangrove blue carbon project in the world https://www.planvivo.org/mikoko-pamoja. With the success of Mikoko Pamoja, KMFRI received funding from various sources to replicate a similar project - Vanga Blue Forest - in Kenya https://www.planvivo.org/vanga.


*KMFRI BOM Chair Hon John Safari Mumba (Far right), Ag Director General Dr James Mwaluma (2nd left) and Aquaculture Director Dr Jonathan Munguti (Left) follow conference proceedings.*

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Blue Carbon (BC) projects are a national priority for meeting mitigation goals under Article 6 of Paris Agreement.

The Mikoko Pamoja carbon project offsets approximately 3000 tCO2e/year which translates to KES3.0 million annually while its sister project, Vanga Blue Forest trades 5,019 tCO2e/year earning over KES7.0 million annually.

Implementation of such carbon credit projects is a triple win that will ensure enhanced ecosystem conservation while improving community livelihoods through job creation as well as aid in mitigating and adopting to climate change impacts.

## What is BlueInvest Africa?

BlueInvest Africa is a business forum initiated by the European Commission to facilitate meetings between African entrepreneurs seeking financing and international investors scouting for opportunities, all centered around projects capable of propelling Africa's blue economy forward.

The business forum focuses on equitable and sustainable development, solutions to food security, and resilience to climate change.

*KMFRI Research Scientist Dr Kipkorir Sigi Langat, explains the significance of Blue carbon ecosystems to the BlueInvest delegates in Gazi Bay*

## Why host BlueInvest forum in Kenya?

Kenya proposed to host the 2nd Blue invest forum following the success of the first edition which took place in Seychelles in 2022, in which 500 onsite and online participants attended, discovered dozens of innovative projects, and took part in more than 100 networking meetings.

Kenya is a leading country in the development of the blue economy and the first to host a global conference on the Sustainable Blue Economy.

It has prioritized the transition to a green economy, combining the needs to generate growth and create employment, with the sustainable conservation of natural resources,

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*Gazi women group displaying their wares. The group runs an eco-tourism boardwalk in the mangroves of Gazi Bay, Kenya*

resilience, and a reduced negative climate impact. Kenya has been actively involved in global efforts to address climate change, signing international agreements, adopting new environmental policies and implementing regulations.

Kenya's National Determined Contributions (NDCs) set out an intention to use Article 6 of the Paris Agreement and lists priority mitigation activities to include harnessing the mitigation benefits of the sustainable blue economy, including coastal carbon Payment for Ecosystem Services (PES).

## Blue carbon markets

Kenya has been proactively engaging in carbon markets since 2005. Carbon markets are trading systems in which carbon credits are sold and bought either on a mandatory or a voluntary basis.

In 2022, Kenya was the second largest issuer of Voluntary Carbon Markets (VCM) carbon credits in Africa, after the Democratic Republic of the Congo. Carbon credits are generated from activities or projects that avoid, reduce or remove CO2 emissions from the atmosphere. Each credit is equal to one ton of avoided, reduced or removed carbon.

Impacts created by the carbon projects are aligned to the Sustainable Development Goals (SDGs) outlined by the United Nations. A replication of the project is being carried out in Lamu county with funding from EU Go Blue Project through UNEP, and additional support from The Nature Conservancy (TNC). The Lamu Blue Carbon Project is expected to generate approximately 75,000 tCO2e/year for carbon trading.

Nature Based Solutions (NbS) represent integrated approaches to addressing the triple challenges that threatens humanity, that is, growing human population, climate change and biodiversity loss. Restoring and protecting blue carbon ecosystems for instance has the potential to provide low-cost opportunities to mitigate climate change.

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Carbon storage and sequestration potential of mangroves is estimated at more than US$ 190 billion. Mangroves are also estimated to reduce costs associated with impacts such as flooding by over US$ 65billion annually.

In Kenya, the total value of mangroves is estimated at US$ 15,000/ha/year.

*Mangroves planting exercise*

Conservation and restoration of these ecosystems can provide sustainable livelihood opportunities for local communities including ecotourism, fisheries and non-timber products. There is therefore need to increase funding for the protection and restoration of nature and its ability to sequester carbon, if we are to achieve global environment targets.

***Mangroves in Vanga***

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BY Nancy Ogega, Brian Isoe & Phionalorna Nzikwa

## A tale of hope for coral reefs in the Kenyan Coast

Climate change is recognized as the 'elephant in the room' being the biggest threat facing coral reefs worldwide. Rising sea temperatures cause coral bleaching, a phenomenon where corals expel the symbiotic algae living in their tissues, hence losing their beautiful colours and eventually turning white. The bleaching can also be occasioned by pollution of the marine ecosystem, low tides, too much sunlight exposure as well as Prolonged temperature increase which may lead to the death of coral reefs.

The latest Intergovernmental Panel on Climate Change (IPCC) report of 2019 climate scenarios shows that 99% of the reef could disappear in this century if no proper resilience factors are put in place to counter these causal activities endangering their survival. While there are coral species that are not resilient to adverse climate change effects, some species can resist and recover from pressures such as bleaching due to their ability to acclimatize to the surrounding conditions and survive the harsh conditions.
Allen Coral Atlas which maps the world's coral reefs and monitors their threats to provide actionable data on the status of coral reefs globally sent out an alert on coral bleaching in Kenya. This was attributed to the rise of heat waves/temperature in the country which consequently increased bleaching rates of the corals as well as the mortality rate of the corals.

These concerns are evident as elaborated by Nancy Ogega a research associate who explains that measures to ensure corals around the globe aren't lost have to be put in place, and monitoring of the same is done often. "Unfortunately, coral reefs in Kenya have not been exempted from these adverse effects of climate change and we need robust measures to ensure expansion of restoration efforts. Recently KMFRI led a team of, managers, scientists, communities, and all stakeholders of the ocean to echo a chorus of concern that corals in Kenya have bleached due to climate change and if nothing is done to curb this bleaching, most of the corals will be dead."

*Bleached corals whitens due to excess rise in temperatures*

Nancy digs deep into her head and asks herself a lot of questions about these effects if nothing is

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done, is there hope for coral reefs in Kenya? What next for our corals? Will we sit down and watch our precious ecosystem die off? What about our livelihoods? Our cultures? Our biodiversity? What is in store for us? She believes there is a lot to be done to educate and sensitize the public and the communities living adjacent to the oceans about what roles the corals play in our lives.

Proper capacity building, and putting in place conventional workable frameworks in order save this marine ecosystem is key to achieving this main goal of conservation.

This connotes that with the increase in the bleaching of the corals, something has to be done and thus, a team of enthusiastic marine conservationists led by Dr Juliet Karisa embarked on a journey to all marine protected reserves in the Kenya coast from Shimoni, Mombasa, Watamu, Malindi, and Lamu counties with a message of hope! Hope for our coral reefs, hope for our environment- Coral reef restoration.

The team conveyed a message of hope to the Kenya Wildlife Services (KWS), Marine Protected Areas (MPA) managers who are entrusted with biodiversity conservation of the environment, and our very own Beach Management Unit (BMU) members who are the main stakeholders of our ocean at the ground level.

The team was received with very interactive and informative members who were eager to embrace new ideas from our scientists and team encompassing coral restoration. The teams

*Community members engage in the construction of restorative materials to aid in these efforts.*

were taken through the simple steps used in the coral restoration process developed by organizations committed to conserving our marine ecosystems such as the Kenya Marine and Fisheries Research Institute (KMFRI), Kenya Wildlife Service (KWS), and Coast Development Authority (CDA).

Discussions revolved around the importance of inclusivity in community engagement and awareness. key emphasis was cemented on the crucial role coral reefs play in supporting about 25% of all marine species, providing food, habitat, and breeding grounds for a wide variety of biodiversity in the ocean, including fish, mollusks, and crustaceans.

According to the Coral Reef Alliance, more than 500 million people globally depend on fisheries as their primary source of food and income, and coral reefs support these industries. They

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support the large-scale commercial fishing industry as well as small-scale fisheries that depend on the ocean for their day-to-day activities.

Eco-tourism-related activities such as diving, snorkeling, and recreational fishing spot are heavily influenced by coral reefs. Local governments with access to the coral reefs can utilize these resources and boost their economy greatly as they attract a lot of tourists both internationally and locally.

Groups drawn from different communities were also educated on site selection for planting of corals, this is key in determining the survival rate of the planted corals in specific sites. This training was being done before the planting of the corals as well as restoring ones that had been bleached.

Baseline surveys of selected sites, restoration methods, and techniques, hands-on training on construction and deployment of selected structures, maintenance, and monitoring after restoration has been done were also passed along.

“This is an effort to ensure the communities understand why it is important to conserve the marine ecosystem on their own as we won’t be there always to assist. It is time the communities take the ball into their court and take charge of conserving corals”.

*Beautiful coral site as spotted in the ocean*

She adds that the challenges facing our coral reefs are great, and the road ahead may be long but with each step we take towards restoring our underwater rainforests, we are an inch closer to a brighter future where coral reefs will thrive once more. Through these trainings from the north to the south of the Kenya coastline a flicker of hope takes root in the eyes of these communities.

*Different stakeholders during a training workshop on coral restoration projects*

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She believes they have set a trend that is to be emulated by all stakeholders engaging in this blue economy sector and is optimistic that the communities will adhere to and heed their teachings to ensure the prosperity of what they have just started.

***"We leave these sites with a lot of hopes and encouragement that we have ignited a spark that will burn brightly long after we have departed. This is not just a tale of hope for the coral reefs in Kenya but a clarion call for every one of us to play a part in bringing this hope into reality."***

## *Mtafiti Pictorials*

*CS for Mining, Blue Economy and Maritime Affairs Hon. Ali Hassan Joho, EGH, planting a commemorative tree during his first visit at KMFRI Headquarters*


*KMFRI Aquaculture Director Dr Jonathan Munguti (2nd left) with Head of Accounts Sagana Mr Patrick Guchu (L ) at the ICIPE - International Centre of Insect Physiology and Ecology offices where they held talks with Dr Chrysantus Tanga (R ), the head of Insects for Food, Feed and Other Uses (INSEFF) and Dr Menaga Meenakshisundaram (2nd left), a PhD holder in aquaculture and postdoctoral*

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*fellow under the Environmental Health Theme revolving around FASA project..*

*Regional Workshop on Reef Restoration in the WIO held in Zanzibar, uniting 41 practitioners and stakeholders for lessons, capacity building, and networking.*


*KMFRI Director of Freshwater Systems Dr. Christopher Aura during a panel discussion at the Kenya National Research Festival 2024, hosted by the National Research Fund.*

*Seaweed farmers in Kwale County, training on best management practices dubbed "Restorative Seaweed Farming".*

*KMFRI Kegati Aquaculture Centre 2-day workshop for MSc Limnology and Wetland Management students, led by Egerton University's Prof. Kitaka and Dr. Ongondo, on 19th-20th August 2024*

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*KMFRI AD Aquaculture Dr. Paul Orina, DD Capacity Building Dr. Victoria Tarus, and Senior Research Scientists Dr. Mary Opiyo, and Ms. Morine Mukami participated in the Third Eastern Africa Regional Aquaculture Conference (EARAC III) at Malaika Beach Resort, Mwanza, Tanzania.*

*KMFRI Senior Research Scientist Dr. Amon Kimeli (left, seated) attends Tanzania workshop to compile bathymetry data under the Nippon Foundation-funded WIObathy Project, part of the UN-endorsed Seabed 2030 collaboration.*

*Attendees of Science Café held at Alliance Française. Mombasa, pose for a photo.*


*KMFRI AD Mariculture Dr. David Mirera at the Kenya National Research Festival 2024 in Nairobi delivers a presentation titled 'Overview of KMFRI Research and Societal Impact' on behalf of KMFRI Director General*