



KENYA MARINE AND FISHERIES
RESEARCH INSTITUTE



2019 MOMBASA INTERNATIONAL SHOW: KMFRI SCOOPS TOP AWARDS

JULY-SEPTEMBER 2019 NEWSLETTER



By **PAUL KIMANZI, AGNES MUKAMI and GLADYS MWAKA**

Kenya Marine and Fisheries Research Institute (KMFRI) joined the world in marking the International Coastal Cleanup Day in an exercise that participants drawn from the institute's staff and volunteers participated. The exercise was conducted in Mkomani and Jomo Kenyatta Public Beach on September 21, 2019 in which different trashes were collected. In the latter beach alone, eight bags of trash weighing 48.5 kg were collected within an hour, painting a grim picture on the alarming rate of beach pollution. A similar activity was conducted by KMFRI Gazi station on 16th the same month in which several groups joined members of the community of Gazi Bay including students from local schools to participate in the clean-up activity. The total amount collected was 1272 kg after only two hours of cleaning, compared to 720 kg collected during last year's event, raising a major concern on the effectiveness of the awareness campaigns that were earlier done in the area on the effects of plastic pollution. The exercise was undertaken on a three kilometres distance along the landing site beach of Gazi in which groups such as Base Titanium, Kwale International Sugar Company Limited (KISCO), SAFE Pwani, Gazi Bay Beach Management Unit, Gazi Women Boardwalk Group and Gazi Youth Environmental Group participated. KMFRI's Mombasa Center Director Dr. Eric Okuku who presided over the Mkomani and Kenyatta Beach exercise underscored the need to establish the origin of the trashes as a way of finding a lasting solution to the beach pollution menace.

"We have colleagues working all over the world, collecting data on what we find along the beaches. We identify what we find on the beaches, the quantities, and the possible origins of what we call a brand audit, that is, the kind of brand they are, the countries of origin or the companies that produce them," said Dr Okuku. At the end of the exercise, the trashes were tallied. It was established that some of the leading polluters along Kenyatta Beach included plastic bottles, food wrappers, take away containers, bottle caps, foam fragments as well as cigarette lighters. Other trash collected included straws, condoms, diapers, lollipop sticks, pegs among other types. Generally, 21 types of trashes were collected and tallied. The institute is running a programme known as Kenya Marine Debris Volunteer Programme (KMDVP) which has been in the forefront to clean up coastal.

Dr. Okuku said that plastic pollution is a new phenomenon for African countries adding that Africa is now working on baseline data on the amount of plastic that is leaking to the ocean and that is in the ocean so as to control the pollution. KMFRI has played a key role in providing data and information on plastic pollution along the coastal beaches which can greatly guide the country in policymaking. The institute has been involved in a coastal cleanup especially along Mkomani since 2014. Data are collected every Thursday on a weekly basis. Dr. Okuku explained that the recyclable trashes such as hard plastics and plastic bottles

collected are kept for a recycler who comes occasionally to collect them adding that KMFRI works in collaboration with Kenya Wildlife Service (KWS) who take the rest of the unrecyclable trashes to Kibarani dumpsite. However, questions were raised over the management of the dumpsite, with Dr. Okuku expressing fears that if the site is not properly managed the trashes will eventually find their way back to the ocean.

According to the United Nations, ingestion of plastic kills an estimated 1 million marine birds and 100,000 marine animals each year. At least 800 species worldwide are affected by marine debris, and as much as 80 per cent of that litter is plastic. It is estimated that up to 13 million metric tons of plastic end up in the ocean each year—the equivalent of a rubbish or garbage truck load's worth every minute. Fish, seabirds, sea turtles, and marine mammals can become entangled in or ingest plastic debris, causing suffocation, starvation, and drowning. Humans are not immune to this threat: While plastics are estimated to take up to hundreds of years to fully decompose, some of them break down much quicker into tiny particles, which in turn end up in the seafood we eat. According to a report published in Environmental Pollution in June 2018, the average person eats 70,000 microplastics each year.



By **MARTHA MWAMBURI**

The ability to explore the deep waters in the ocean is becoming extremely important for researchers to understand the nature of the seawater for the growth of the blue economy and predict future scenarios including climate change.

Every year, Kenya Marine and Fisheries Research Institute (KMFRI) conduct research in the Indian Ocean using RV. Mtafiti. One such research was the Fisheries and Hydro –Acoustic and Environment Survey of Kenya’s Territories Waters and the Exclusive Economic Zones (EEZ) which kicked off on 2nd October and ended on 14th October 2019.

This cruise covering the Territorial waters and the EEZ was divided into blocks. Block one was Lamu, block two was Kilifi and block three was Kwale. The cruise was led by Dr. Tsuma Jembe assisted by two young female scientists; Josephine Njeru and Amina Makori who were the team leaders.

The researchers focused on studying seawater properties by measuring the amounts of oxygen, phosphates, nitrates and trace elements. The water samples were analyzed onboard RV Mtafiti.

The scientists also researched on the biological aspects of the ocean. These included common mainly microscopic living organism in the ocean known as zooplankton and phytoplankton.

KMFRI Scientists further assessed the marine biodiversity which included marine mammals, sea birds and turtles. Lastly they assessed the types and distribution of microplastics in the ocean, which would determine the level of pollution.

This data will help to address the challenges facing the development of the blue economy in Kenya such as pollution and its effects on marine creatures. It will also help the government to form policies which will help the blue economy thrive.

By **PAUL KIMANZI**

Kenya Marine and Fisheries Research Institute (KMFRI) joined the world in celebrating the International Day for the Conservation of the Mangrove Ecosystem on 26 July 2019, at Vanga, South Coast, Kwale County amid calls for restoration of these crucial tropical trees all over the world.

Top environmentalists who attended the event stressed on the need to conserve mangroves arguing that these ecosystems contribute to food security, and protection of coastal communities.

Chief Conservator of Forest (CCF), who was the chief guest during the event, Mr. Julius Kamau said that there should be teamwork among different forest stakeholders in mangrove conservation, adding that failure to manage the mangroves ecosystem leaves everyone defenselessly exposed, as sea has continued to encroach on human inhabitants.

“Let’s develop a culture of protecting and conserving our forests,” Mr. Kamau said, lamenting that some forests have no management plans.

The CCF further called on media to create awareness on forest conservation because the vast majority of Kenyans know little about the importance of ecosystem management.

Mangroves are rare, spectacular and prolific ecosystems on the boundary between the land and sea. These extraordinary ecosystems contribute to the wellbeing, food security, and protection of coastal communities globally.

They support rich biodiversity and provide a valuable nursery habitat for fish and crustaceans. Mangroves also act as a form of natural coastal defence against storm surges, tsunamis, rising sea levels and erosion. Their soils are highly effective carbon sinks, sequestering vast amounts of carbon.

KMFRI Board of Management (BoM) Chairman Hon. John Mumba, who was also in attendance, thanked various forest stakeholders for joining hands in supporting forest conservation initiatives stating that Vanga has about 450 hectares of mangroves forest which must be taken good care of. In his address, KMFRI Chief Scientist Dr. James Kairo, said there should be dedicated effort to support management of mangroves in Kenya.



By **EDNA WAITHAKA**

Data from Kenya Marine and Fisheries Research Institute (KMFRI) show the reintroduction of Nile tilapia in Lake Naivasha under the Economic Stimulus Programme (ESP) has transformed the dwindling fishery, recording improved catch from 5.9 metric tons in 2013 to 1100 metric tons in 2017 translating to 67 per cent of the total annual catch.

Information published in the Fisheries and Aquaculture Journal indicates Nile tilapia was first introduced into Lake Naivasha in 1967 in order to diversify and boost the deteriorating fishery of the lake. However, it disappeared from the lake in 1971 but was later reintroduced by the Kenya government during 2011 and 2014 under the ESP.



A sample catch of fresh Nile tilapia from Lake Naivasha

Nile tilapia, whose scientific name is *Oreochromis niloticus*, is one of the most economically important fish species sustaining many inland fisheries around the world. This is because it is hardy and easily adapts to novel environments due to its plasticity in feeding, competitiveness and reproductive success as it provides parental care to its young, according to information published in the Research Gate database. The fish has adapted and established viable populations within the lake overtaking the previously dominant Common carp, *Cyprinus carpio*.

The successful establishment of this species in Lake Naivasha is attributable to a number of factors. First, thousands of fingerlings of this species were deliberately introduced into the lake by the Department of Fisheries, in collaborations with local Beach Management Units and other stakeholders. Second, Nile tilapia is known to be a resilient and fast-growing species which easily adapts to new habitat conditions. Third, water levels of the lake have consistently remained high, thus provided conducive habitat for feeding, breeding and refuge for the species.

However, records from KMFRI indicate that Nile tilapia, among other key fish species in Lake Naivasha is currently being overexploited. This is witnessed by the landing of all the beaches. Indiscriminate use of illegal fishing gears and poor fishing methods are the main risks to the established population of *O. niloticus* and the various other species, which may adversely affect the overall fishery production in the long run. Fisheries managers are encouraged to design appropriate regulatory

By PAUL KIMANZI

Research scientists at Kenya Marine and Fisheries Research Institute (KMFRI) signed their scientific targets as formulated in their Balance Score Card (BSC) in an exercise presided over by the Deputy Director in charge of Marine and Coastal System Dr. Renson Ruwa.

In his speech, Dr Ruwa lauded the researchers for their exemplary work, adding that the BSC will help stimulate their performance. Dr. Ruwa also urged the staff to work towards achieving their targets by keeping track of all their activities to make it easier for them to produce evidence.

'BSC is a performance tool that is not used to punish you but rather to enhance your productivity,' said Dr. Ruwa.

'Every time you are here, your motivation will be to score,' the Deputy Director said expressing optimism that the BSC will help stimulate the performance of the researchers.

The scientists signed in a tier depending on their seniority with the Chief Scientist Dr. Johnson Kazungu appending his signature first followed by Principal Research Officers, Senior Research Officers, Research Officers and II and so on, in that order.

In his closing remarks, Dr. Ruwa encouraged the senior staff to ensure a smooth succession by mentoring officers below them.

Senior scientist and the Assistant Director (Oceanography and Hydrography) Dr. Joseph Kamau, in his address, echoed Dr. Ruwa's remarks urging the scientists to keep on documenting all their activities.

'I encourage everyone to perform and excel,' Dr Kamau said.

Assistant Director Planning and Socioeconomics Dr. Jacob Ochiewo, in his remarks, praised the harmonized BSC adding that it will make work easier for the researchers.

'I want to appreciate the BSC Secretariat. Since we started the process, now it is officially rolled out.

The institute has two unique types of BSC. The first kind is the one containing scientific targets signed by the researchers while the second type is signed by the support departments which entails human resource, finance, public relations and so on. Research is the KMFRI's core mandate.

The BSC is a strategic performance measurement model developed to translate an organization's mission and vision into actual (operational) actions (strategic planning). In addition, it provides information on the



KMFRI Researcher Ms. Lilian Nduku signs 2019 BSC

By **JOB MWAMBURI**

Recent data released by scientists from Kenya Marine and Fisheries Research Institute (KMFRI) indicate the weed invasion in Lake Victoria has been on the rise since February 2018. The highest peak spread across an area of 17, 372.62 Ha in December 2018, then steadily declined to the 6,299.10 Ha in March 2019.

The analysis of data on biological control agents shows the weevil, *Neochetina* spp. has had the greatest impact on the water hyacinth mats within Homa Bay, unlike other hot spots, possibly due to the existence of larger populations of remnant weevils left behind within fringe weeds after previous invasions.

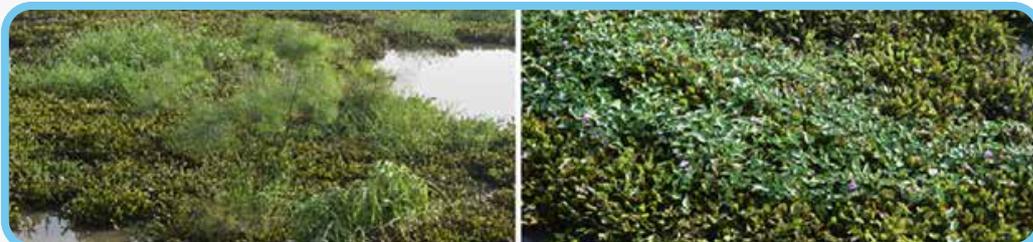
Notable water quality effects included the observed hypoxic conditions at most of the shallow areas of the bay. KMFRI Scientists recommend the continuous surveillance and monitoring to better guide on better methods of control and eradication of the weed; and movement patterns, so as to enhance the safety of the resource users.

The research was done by the institute's freshwater scientists based in Kisumu whose studies focused on different issues of concerns and embarked on the dissemination of research findings for more engagement and sharing on challenges and possible areas of collaboration.

The key information on the trends in coverage and re-appearance of water hyacinth within the Nyanza Gulf was repackaged in a fact sheet titled 'Monitoring and mapping of water hyacinth and other floating macrophytes in Lake Victoria for improved water hyacinth surveillance to inform resource users' Fact Sheet no: KMF/RS/2019/PB/C 2.7.

The dissemination of repackaged scientific data and information is considered to be a faster means of sharing knowledge and translation of scientific recommendations for adoption or implementation. This also provides an opportunity for KMFRI to enhance its visibility in the marine and fisheries innovative research. The data release activity to place on various dates in March 25th – 28th and May 16th – 17th in all the five counties that border Lake Victori; that is (Migori, Homa Bay, Kisumu, Siaya and Busia).

The invasive water hyacinth is considered a menace in most aquatic ecosystems due to its fast growth characteristics and the associated ecological and socio-economic impacts to water users. The quarterly monitoring information on coverage of water hyacinth and other floating macrophytes was collected through desk-based analysis of satellite images, and field ground-truthing and sampling areas under the water hyacinth cover and exposed control sites.



Unhealth status of water hyacinth and succession by other floating macrophytes in the Winam gulf



Dissemination meeting at Migori County Director of Fisheries Office on 27th March 2019 (2nd R-L: The Migori County: County Executive Committee member (CEC Agriculture /Fisheries); Chief Officer Fisheries and County Director of Fisheries)



KMFRI's Show Committee Chairman Dr. Peter Oduor Odote presents a trophy to BoM Chair Hon. John Safari Mumba as KMFRI Director Prof. James Njiru looks on



Dr. Odote takes a judge through KMFRI's stand



Volunteers sort out trash collected along Kenyatta Beach during the cleanup



Volunteers march towards Mukomani Beach to collect trash during International Coastal Cleanup exercise



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KMFRI BoM Chair Hon. John Safari Mumba is assisted by the Institute's Chief Scientist Dr. James Kairu to plant mangrove during World Mangrove Management day at Vanga



KMFRI Deputy Director Dr. Enoch Wakwabi hands over constitution on mangrove management to CFA of VAJIKI as Head of Forest Management Planning Dr. Elizabeth Wambugu looks on



Unhealth status of water hyacinth and succession by other floating macrophytes in the Winam gulf



Members from across Africa during a training

KMFRI HOSTS TRAINING



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