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Every year, the MASMA and Cities and Coasts project grantees meet with their Programme Committees (PCs) to report on the status of the research projects underway, and to receive feedback from the PCs.

Grantees also have an opportunity to learn from one another’s experiences, engage in dialogue, and explore synergies and collaboration between projects. Ordinarily, these meetings would take place in person, but with the onset of COVID-19, this has not been practical and for the past two years WIOMSA has hosted virtual grantee meetings.

**This year’s meetings were held virtually on 24 to 25 November for MASMA and 2 to 3 December for the Cities and Coasts project.**

According to the grantee presentations, many projects are feeling the consequences of COVID-19. Projects that require the physical participation of stakeholders have been hardest hit. In most of these projects, it was essential for stakeholders to meet and exchange ideas, sometimes across country borders, as is the case with the **Miji Bora** project. However, due to restrictions on travel, meetings have not taken place, delaying the achievement of project goals. Similar constraints have impacted on meetings between partners and fieldwork.

While certain types of fieldwork and some meetings can be achieved through the use of technology, some tasks simply cannot be done without getting out, into the field. Most research projects grappled with ways to make fieldwork efficient and effective, but also COVID-safe.
With the exception of in-person stakeholder meetings, many projects reported that other objectives are progressing smoothly and steadily. Methodologies have been developed to evaluate the impact of port development under the **LAPSSET** and **BANDARI BORA** projects. In some cases, overcoming the fieldwork limitations of COVID-19 has required a higher than usual level of collaboration with partners and other organizations, as demonstrated by the **BILLFISH-WIO** project that so far has brought on board 20 collaborators and nine students. These collaborations have resulted in several co-authored publications, including the book *Billfish in Africa: Perspectives from the WIO Region* and several other scientific articles. Some projects like **CICLICO** have developed robust methods for stakeholder engagement and analysis that can be applied to multiple project locations and types.

Other interesting outputs from the projects include establishing a multi-stakeholder forum, namely the Mombasa Smart Sustainable City Forum (MSCF) under the **MIJI BORA** project. The MSCF is a multi-stakeholder mechanism and a framework to enhance collaboration among the actors in the City of Mombasa. The scientific findings of the Miji Bora project have also been utilized to inform the establishment of the Mombasa County Government’s Climate Change and Adaptation Policy. The **MICROMARE** project has established a baseline for microplastic pollution distribution patterns and identified hotspots of microplastic pollution accumulation in Tanzania and Kenya.

**These are just a few examples of how initiatives have innovated and continued to work despite the COVID-19 pandemic. For the time being, WIOMSA will continue to work closely with its grantees with a view to taking the projects forward.**

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*A photo of the Cities and Coasts Programme Committee and the WIOMSA Secretariat*

WIOMSA is currently funding 10 research projects under the Marine Science for Management (MASMA) research grant programme and five research projects under the Cities and Coasts project. These include the newer projects which were approved in 2020–2021: APTSAD, BLUEGRASI, Fish juvenile recruitment in coastal habitats of Western Indian Ocean, the Blue Urban Agenda and Bandari Bora.
A PARTNERSHIP TO STRENGTHEN MARINE PROTECTED AREAS

By Jessie McGrath and Keith Roberts

This professionalization programme will expand the expertise of marine protected area (MPA) and locally managed marine area (LMMA) managers and professionals through training and certification, while standardizing the profession.

After the successful completion of their training MPA professionals and their teams will be connected to on-the-ground partners via the Western Indian Ocean Marine Protected Areas Network (WIOMPAN). This network provides ongoing mentorship and capacity-building opportunities, as well as access to up-to-date research and information about marine conservation. WIOMPAN is also geared to improve regional and global connectivity between MPA and LMMA professionals.

WIOMSA and the Blue Nature Alliance see the mentorship and training of MPA and LMMA managers as a tool for realizing each person’s potential for professional growth, learning from the experience of others, establishing a collaborative network of practitioners, creating a pathway into marine protection leadership, and for supporting effective marine conservation.

Through the partnership with WIOMSA, the Blue Nature Alliance is working towards the transition from capacity building to capacity sustaining in the western Indian Ocean region, thus moving the conservation journey of each MPA toward active and effective management.

The Blue Nature Alliance has partnered with WIOMSA to support the Western Indian Ocean Certification of Marine Protected Area Professionals (WIO-COMPAS) programme.

The Blue Alliance

The Blue Nature Alliance is an ambitious global partnership that collaborates with governments, non-governmental organizations, local people and scientists to advance effective large-scale ocean conservation.

Learn more at bluenaturealliance.org

The Blue Alliance
The planning fraternity met in Malindi, Kenya in November to study the challenges faced by planners. WIOMSA participated in the event through the Cities and Coasts project. The Association was one of the key sponsors of the convention and a team leader of the theme “Towards an integrated land-sea planning framework for Kenya”.

The convention brought together a pool of multi-disciplinary professionals, government institutions and agencies, and non-governmental organizations, all of whom made a call for planners to take their rightful place in steering the development of Kenya and East Africa at large. The other themes of the conference included: the EU/UN-Habitat/UNEP Go Blue Project “Effective plan implementation to guide investment and development control” and “Plan based land administration and information management”.

Several grantees of the Cities and Coast project delivered presentations at the land–sea planning session. Prof Daniel Irurah of the Miji Bora Project and University of Witwatersrand challenged the planners to work “beyond our bare minds” by initiating and using the Internet of Things to be effective in managing coastal cities. This challenge was reiterated in the presentation by Dr Mutuma on the use of nanotechnology as a medium to help coastal cities deal with the constant challenge of plastic waste. The concept of sustainable production and consumption in enhancing the blue economy was the focus of the Fish Force Academy presentation by Josephine Muchogu based on the research from the “Blue urban agenda for the coastal cities of Kenya” a project funded by WIOMSA. Jared Bosire of the Nairobi Convention also delivered a talk on the importance of understanding the value of the coastal ecosystem when planners initiate and approve development plans.

WIOMSA president, Jacqueline Uku, outlined the importance of planning holistically in the context of inadequate natural resources and capacities. She advocated for the inclusion of marine spatial planning and active land–sea planning in the preparation of terrestrial plans.

The land–sea session was closed by Valentine Ochanda, manager of the Cities and Coasts project, who delivered a message on blue economy and the three challenging pillars in coastal cities, namely waste management, proper planning and urbanization and climate change. She reiterated the importance of understanding city-based characteristics before planning and the need for planners to be informed about areas that can enhance the blue economy, e.g. fishing, marine transport and tourism.

The WIOMSA team was acknowledged and thanked for being a dedicated partner of the Kenyan, Tanzanian and Ugandan planner’s forum.
The Western Indian Ocean Certification of Marine Protected Area Professionals (WIO-COMPAS) is delighted to announce that the first ever cohort of Marine Protected Area Professionals (MPA PROs) has successfully renewed their certification, having fulfilled all the requirements for re-certification under the WIO-COMPAS programme.

All MPA practitioners who hold the WIO-COMPAS MPA PRO designation are attested to have mastered the knowledge and skills needed to be successful MPA professionals. To continue to hold the MPA PRO designation, the practitioners are required to commit to staying current in the field by re-certifying their MPA PRO designation every five years and demonstrating professional growth since their original certification.

The WIO-COMPAS re-certification is a three-month process which entails the submission of documents such as:

- application form and motivation statement
- completion of a self-assessment report providing evidence of progress in the professional development recommendations made at the original certification and professional growth experienced since certification
- an impact report outlining the impact the certification has had on the candidate’s work and on marine conservation in their MPA and beyond
- a letter of support from the candidate’s institution or supervisor.

In addition to this, the candidates also attended a virtual interview with the panel of WIO-COMPAS assessors.

Learn more about our newly recertified MPA PROs here:

**Allen Cedras**

has over 16 years of experience in the field of marine conservation and significant experience in ocean governance specializing in marine spatial planning. With a Master’s degree in Conservation and Rural Development, Allen is a specialist in the management of MPAs and has worked in the Seychelles and Mauritius in this field. Allen was appointed Chief Executive Officer of a new authority – the Seychelles Parks and Gardens Authority – in January 2021.

**Johan Visagie**

is a Conservation Manager at Dassen Coastal Complex with CapeNature in South Africa. He has 20 years of conservation management experience and a demonstrated history of working in the environmental services industry.

“Re-certification will allow communication with other MPAs to continue which will facilitate peer learning and mentoring opportunities,” said Johan.
Edward Richards

has worked as a Marine Ranger attached to the Betty's Bay MPA in South Africa, for the past 10 years. He is currently in his final academic year at the University of South Africa, working towards a Bachelor of Arts in Environmental Management. He is WIO-COMPAS Level 1 and Level 2 certified.

“The recent re-certification of WIO-COMPAS level 2 gives me pride as I am fully aware of the high standards held by the organization and assessors,” said Edward. “Looking forward, I am dedicated to qualifying as a WIO-COMPAS assessor. I believe this will provide me with the opportunity to mentor and give back to present and future MPA professionals what I have learned and experienced over the past 10 years.”

Jairos Joel Mahenge

holds the title of Project Executant for the Strengthening Marine Protected Areas Management in Rufiji, Mafia and Kilwa Districts in Tanzania which is being implemented by WWF Tanzania.

“The WIO-COMPAS re-certification is of great value to me,” he said. “It is not only an opportunity to renew my status as a recognized professional in MPA management but also a step forward in uplifting learning and improving professional knowledge on the management of MPAs in the WIO region and beyond.”

Humphrey Mahudi

is a Senior Marine Conservation Warden at Tanga Coelacanth Marine Park, operated by the Marine Parks and Reserves Unit, Tanzania. He holds a MSc in Biodiversity Conservation which is a reflection of his commitment to working in the field of marine conservation.

“I am delighted by the WIO-COMPAS re-certification,” said Humphrey. “It is an affirmation that I am on the right path in my career and motivates me to work even more diligently in the protection of our MPAs which face several challenges. I am determined to mentor my colleagues to undergo the WIO-COMPAS certification and re-certification process so as to build a critical mass of competent MPA Professionals in Tanzania to respond to the global biodiversity target of effectively protecting 30 percent of the planet by 2030.”

Mouchitadi Madi Bamdou

is the head of the marine protected area of Mohéli National Park in Comoros. He holds a master’s degree in ecology and environmental management from Mohamed Premier University, Faculty of Sciences of Oujda, Morocco. He was recruited to Mohéli Marine Park in 2009 as communication, environmental education and awareness manager. He passed his first certification with WIO-COMPAS in 2014. In 2016, he was appointed to his current position. He has benefited from several regional and national initiatives, including on marine planning for the western Indian Ocean and as an expert in the work of the regional project Wiosymphony.
WIO-COMPAS holds its first certification renewals!

Willys Osore Ojuok is the Warden at Kyunga Marine National Reserve, Kenya Wildlife Service, Kenya. His key strengths are in building and maintaining trust with colleagues and stakeholders.

“The re-certification is a demonstration of my dedication to marine conservation,” says Willys. “My first certification as a Level 1 Professional was in 2012, and my Level 2 certification in 2015, shows my commitment to this profession. The re-certification will help to verify that I am a skilled professional in the field of marine conservation. The re-certification will also showcase me as a valuable contributor to MPA management in the western Indian Ocean region. It will bring with it professional credibility and will help me gain recognition of my efforts in continuous learning and self-improvement.”

Keith Spencer is a Marine and Coasts Specialist, at CapeNature in South Africa.

“Having practiced marine implementation management for more than 20 years in various South African marine protected areas and estuaries, my strengths lie in developing and implementing protected area management systems which are practically implementable and designed to achieve planning objectives and strategic goals,” he says. “Re-certification in the WIO-Compas programme, with its seven key competence areas, massively aligns and cements my efforts constructively into process designs and implementation actions on a day-to-day basis. It further aids my goals of integration of conservation actions across a broad spectrum of partner-based activities.”

WIO-COMPAS congratulates Allen Cederas, Edward Richards, Humphrey Mahudi, Jairos Mahenge, Johan Visagie, Keith Spencer, Mouchtadi Madi and Willys Osore on their re-certification as Level 2 WIO-COMPAS MPA PROs!

Learn more about our newly recertified MPA PROs here: continued...
The main goal of the Regional Benthic Imagery Workshop, hosted by the South African Department of Forestry, Fisheries and the Environment and sponsored by WIOMSA’s MASMA programme, was to provide information and training on how to use an underwater imagery platform to better understand benthic invertebrate communities and simultaneously sampled fish assemblages.

The week-long virtual event was conducted between 30 August and 3 September 2021 in partnership with Scifest Africa, as well as specialists from the region and beyond. Sessions included lessons, practical demonstrations, and discussions provided in both English and French via a Zoom webinar platform and broadcast live on WIOMSA’s Facebook page. The event drew 266 participants from countries predominantly in the western Indian Ocean, and a small number from neighboring countries in Africa and India. Attendees included researchers, lecturers, students, technicians, interns and scientific officers.

An introductory session on benthic invertebrates showcased preliminary results of the Second Indian Ocean expeditions (IIOE2) and a WioBenth project focused on shelf and upper slope habitats. A session on survey design using visual techniques covered (i) key spatial, temporal and ecological considerations, (ii) suitable monitoring strategies for marine protected areas, and (iii) the use of geographical information systems to assist and standardize long-term monitoring techniques.

A data collection session explored benthic camera systems and the technical complexity, cost, and the expertise required to deploy them. Lessons demonstrated how research objectives determine both the operational mode (exploring, searching, mapping or monitoring) and camera platform required. Gathering environmental data to validate and supplement visual data was also covered and step-by-step training videos of benthic camera systems were a key highlight, demonstrating the set-up, deployment, field operation and pre- and post-deployment protocols.
Another session addressed the various software packages used to annotate videos and images, as well as types of analyses for image data. The software programmes taught are mostly freely available online.

Lessons and a training video in the baited remote underwater video (BRUV) session demonstrated how to perform BRUVs and stereo-BRUVs research, including field sampling, experimental and equipment design and considerations, as well as standard operating procedures and software options to process footage and perform benthic habitat descriptions. A session on data management covered everything from the administration and preservation of reference collections, to the procedures and tools needed to manage data.

Most data is not adequately inventoried, structured, cleaned, verified or accessible. Following the correct data management processes will enhance access and utilisation of data for better characterization of benthic habitats, species inventory and inputs to spatial conservation planning and management.

The discussion session was devoted to participatory talks and topics that covered the best practices for regional-scale habitat classification, data challenges and overcoming these barriers, as well as developing collaborations and infrastructure.

The success of the workshop is evident in the feedback captured in an online evaluation form:
The outcomes of the workshop included:

- an internationally attended workshop that reached a far wider audience than first proposed prior to COVID-19 (266 versus 20!)
- participants trained in the steps required to conduct underwater imagery and minimize the techniques’ shortcomings by employing taxonomy and collections as a verification tool
- a free online training resource of the session recordings via a YouTube channel (https://www.youtube.com/channel/UC3FT8SyYif6X_b1s4zchgog/videos).
- step-by-step training videos of three camera systems available in English and French which can be used for teaching purposes, and is a first step in standardizing techniques among institutes in the western Indian Ocean
- a well-established network for benthic image-based research within the western Indian Ocean.

From attendee questions it is evident there is a need for the continued development of sampling guidelines and best practice protocols, as well as locally relevant species identification resources and image databases. Our immediate steps are to produce a specimen occurrence and image observation database from the IIOE2 expeditions, while building on the momentum created by this workshop, and continuing to form and strengthen partnerships. Finally, many institutes lack the resources and infrastructure required to utilize underwater imagery, but this may equally encourage collaboration and innovation within the region.
STAKEHOLDER COLLABORATION TO ADDRESS PERENNIAL PROBLEMS IN MOMBASA CITY

By Innocent Wanyonyi

Stakeholders in the city of Mombasa, Kenya, have established a multi-stakeholder forum to address the perennial problems that impact the city, including solid waste management, water and sanitation, energy and transport.

The Mombasa Smart Sustainable City Forum (MSCF) was established in June this year, marking a turning point in the trajectory of Mombasa as a smart, sustainable city. The MSCF stimulates engagement among stakeholders and decision-makers on the key issues of common concern and identifies common ground for future actions at city and stakeholder levels. It is coordinated by the County Department of Environment, with technical support provided by the Miji Bora team, which is funded by WIOMSA’s Cities and Coasts Project.

The forum has established thematic technical working groups on plastic and solid waste, natural capital, transformative river management, climate action in the transport sector, and port city planning. Consideration for sustainability is reflected both in the organization of the forum and by creating synergies among partners on issues of common interest, such as sharing work plans for effective delivery.

Between September and December this year, the MSCF brought stakeholders together to participate in mapping future scenarios through a series of “hackathons”, including a solid waste hackathon, a climate change hackathon (climathon) and a “Mombasa Smart Future Scenarios”.

A cross section of the Mombasa Climathon participants
Key partners in these activities were the County Government of Mombasa Department of Environment, Energy and Solid Waste Management; the Blue Economy Innovation Hub; Technical University of Mombasa; Boost your Business of Close the Gap; Green World Campaign; Coastal Oceans Reasearch and Developmen; and the Miji Bora project, among others.

The solid waste hackathon enabled 40 qualified youth to take a closer look at the complex issue of solid waste management and develop viable ideas into actual products or prototypes. All ideas, including four on mobile phone applications, were taken into an incubation programme to allow development into viable business opportunities and start-ups.

The climathon provided an opportunity for communities to co-create ideas that address local climate challenges. Of the nine teams that participated, four worked on solving the natural capital challenge and five on the greenhouse gas emissions challenge. Teams were coached to develop viable solutions. The winning solution was awarded and allowed to move to incubation and business development.

The Mombasa Smart Future Scenarios process aimed to build and incorporate futures thinking approaches into Mombasa County and the MSCF partners. Stakeholders analyzed the current state and expected futures, and actions needed for a better future. The main outputs included long-term visions and revised work plans for the respective thematic technical working groups.
BUILDING REGIONAL CAPACITY FOR MARINE LITTER MONITORING

The Kenya Marine and Fisheries Research Institute (KMFRI) and WIOMSA implemented a regional marine litter monitoring training course in Mombasa, Kenya from 22 to 29 November.

The training was attended by participants from Madagascar, Kenya, Tanzania and Mozambique and was delivered by five experts, under the leadership of Eric Okuku from KMFRI.

The objective of the course was to provide an in-depth understanding of harmonized protocols for inland and marine litter survey and assessment in order to standardize data collection and analysis. Other goals were to encourage the establishment of robust monitoring programmes for inland, riverine and marine litter and to facilitate reporting for Sustainable Development Goal indicators 11.6.1, 12.5.1 and 14.1.1.

The training acknowledged the important role played by reliable and timely data and information in the planning and operational management of solid waste collection and disposal in coastal cities, and the role of urban planning in solid waste management. It was delivered through classroom and field sessions. Training for inland litter included methods for assessing litter along the streets, including street “hotspotting”, assessment of litter in storm drains and in dumpsites. For marine litter, the course covered methods for the assessment of litter in sandy beaches, estuarine environments, mangrove areas and floating litter. And for river systems, the training covered assessment of litter borne in the river channel and in estuaries.

Participants were further exposed to a session on quality control and quality assurance to boost the quality of data and information generated using the methods discussed.

“There is a need to understand how big and how widespread the plastic pollution problem is,” explained Eric Okuku. “The use of standardized methodologies is particularly important in comparing data generated at local, regional and international levels. We are glad that WIOMSA has provided us with this platform.”
The emergence of cities and small towns in coastal areas once inhabited by rural populations is putting pressure on marine and coastal ecosystems and the services they provide.

There has been an associated shift in the consumption patterns, energy requirements and food production of the growing “urban population” which may alter the stable state of an ecosystem in which all its components thrive.

It is against this backdrop that a training workshop on the assessment of ecosystem dynamics in the emerging coastal towns of the western Indian Ocean was conducted. The aim of the workshop was to build the capacity of local development and conservation practitioners in the western Indian Ocean region in the field of ecosystem and ecosystem services assessment in order to actively engage in achieving sustainable, resilient, and inclusive coastal cities.

The workshop took place in Kilifi, Kenya and was organized by Kenya Marine Research Institute in collaboration with South Eastern Kenya University, environmental research, conservation and management organization, ERACOMA, Machakos University, Kenyatta University, the University of Nairobi, and the University of Algarve, Portugal. It was funded by WIOMSA’s Cities and Coasts project.

A total of 21 participants, including planners, research scientists, lecturers and conservationists were selected from a pool of over 100 applicants from the western Indian Ocean region to attend the workshop. The topics covered included coastal ecosystems, ecosystem services frameworks, ecosystem–human interface and threats associated with the interactions between humans and ecosystems. The trainees were also introduced to a variety of tools used in the mapping and assessment of ecosystems services. A combination of classroom practical exercises, group discussions, case studies and field work was employed during the training and a blended mode of teaching was adopted, with trainees participating in person or virtually.
A training course in “application of nanotechnology as a solution in circular economy through managing plastic wastes and the production of nanotubes” was hosted by WIOMSA in South Africa.

The training team included representatives from Nanotech Futuristic Solutions, Kenya; Sabinano, South Africa; Mintek, South Africa; and the University of the Witwatersrand.

A total of 16 representatives from the western Indian Ocean region attended the training.

Nanotubes can be used for important purposes, including the creation of resilient and stronger building materials and energy efficient materials. And they can be used to make smart sensors for environmental pollution management, wastewater treatment and sustainable building materials, among other things.

Nanotechnology has the potential to contribute to improved service delivery and monitoring, increased sustainability and the creation of safe cities, but it faces challenges such as a lack of policy on enhancement of material sciences within the region, a lack of applicable skills and technology assimilation, and a need for a concerted effort in adopting sustainable materials.

It was noted by Prof Sabelo Mhlanga of Sabinano that Africa is still struggling with the development and efficient use of nanotechnology as part of solutions for cities, and especially coastal cities, in contrast to European countries where these technologies have been embraced to reverse the impacts of a changing climate. He challenged the learners to initiate start-ups that can adopt nanotechnology as a remedy for some of the problems plaguing coastal cities. Prof Neill Coville of the University of Witwatersrand encouraged the trainees to look at options for creating an environment where nanotechnology can thrive in Africa.

The nanotechnology training was organised by WIOMSA’s Cities and Coast project.
BOLD NEW ACTIONS TO PROTECT, DEVELOP, AND MANAGE THE WESTERN INDIAN OCEAN

By Angela Patnode

At a time when marine species are disappearing from their habitats at twice the rate of those on land, marine litter is projected to more than double by 2030, and climate change has altered the ocean’s ability to provide us with oxygen, regional cooperation to protect our oceans has never been more essential.

In acknowledgement of the need for strong regional collaboration, Contracting Parties of the Nairobi Convention for the Protection, Management, and Development of the Coastal and Marine Environment of the Eastern Africa region took major actions to improve water quality, fight climate change, protect critical habitats, and more at their 10th Conference of Parties (COP10).
States first approved the new Nairobi Convention Work Programme for 2022 to 2024, which includes four priority areas:

- **management and operational support** to Contracting Parties in implementing COP10 decisions and developing ocean financing and governance approaches
- **assessment and conservation** of critical habitats and endangered species
- **coordination** and legal aspects
- **information** and awareness.

Contracting Parties also adopted Decision 5, requesting that the Secretariat create an ocean governance strategy, in recognition of the fact that governance of the ocean – an irreplaceable source of food, jobs, and economic security – needs to be strengthened in order to protect its central role in human survival. Contracting Parties further addressed one component of strong ocean governance – oil spill preparedness and response – under Decision 6, which requested the Secretariat to develop a regional action plan to support the review of national oil spill contingency plans, identify capacity gaps in oil spill preparedness and response, and prepare oil spill sensitivity maps. The urgency of such measures was demonstrated by the 1 000 ton *Wakashio* oil spill that took place in Mauritius in 2020.

Other key decisions include Decision 7, under which Contracting Parties requested the Secretariat to develop a regional action plan that would monitor, mitigate and minimize ocean acidification. Decision 10 requested the Secretariat to establish a regional task force on water quality. The task force will help develop a water quality monitoring framework and guidelines for the region.

Additional decisions covered actions linked to marine spatial planning, an ecosystem monitoring framework, a regional mangrove action plan, and more. Click here to read all decisions.
Marine protected areas (MPAs) have a long history in the western Indian Ocean region and a large number of efforts, projects, programmes and initiatives to protect the marine environment has been implemented. Despite this, the Marine Protected Areas Outlook Report, published in July, identified crucial needs for improvement to reach a successful and well-managed marine protection. Swedish Agency for Marine and Water Management Ocean is working to address the issue of capacity development connected to adaptive management of MPAs by setting up a series of holistic seminars followed by long-term training of MPA managers in selected case study sites.

Between June and October, three seminars were hosted in close collaboration with the Nairobi Convention and WIOMSA. The aim of the seminars was to inspire and inform, but most importantly to create an understanding of some crucial components of a qualitative network of MPAs that are functional and effectively managed – to fulfil their goals and not be so-called “paper parks” that make no difference to marine ecosystems. We are not re-inventing the wheel here, but further developing the existing MPAs and emphasizing the need for functional, integrated marine management in which different tools work together towards the same vision.

Did you miss the seminars? Don't worry! View the recordings here.

Five teams MPA managers from Madagascar, Comoros, Tanzania and Zanzibar
Five teams for strong capacity in MPA management

Five teams consisting of MPA managers from Madagascar, Comoros, Tanzania and Zanzibar are selected for this first training in using the method Conservation Standards to sharpen their capacity in adaptive management of MPAs. The selection of teams is based on the Marine Protected Areas Outlook Report and discussions with the Western Indian Ocean MPA Network. The Swedish Agency for Marine and Water Management intends to continue the initiatives in the western Indian Ocean region and enlarge the training and capacity development programme to include more sites and more teams. This is an important step to move towards to the global agreements to protect at least 30 percent of the marine ecosystems by 2030 and utilize marine resources sustainably into the future.

Whale shark © Sam Farkas, NOAA OAR 2014 Photo Contest

The Swedish Agency for Marine and Water Management (SwAM) focuses on the western Indian Ocean region in its development cooperation programme called SwAM Ocean. The aim of this programme is to increase the opportunities for people to live richer lives by managing marine resources in a sustainable, smart way. We believe in strong capacity to plan the future of the ocean, to take care of the ocean and to use the ocean – for the joy and benefit of all. SwAM Ocean is focused on marine spatial planning, blue economy and marine protection.
The TBCA initiative began in 2015, during the eighth Conference of Parties of the Nairobi Convention, when Kenya and Tanzania committed to work together to conserve their common transboundary maritime ecosystems. The two workshops in Diani, Kenya, and Tanga, Tanzania, hosted by KWS and MPRU, respectively, were the second in a series of stakeholder meetings to develop the TBCA conservation plan. The workshops were scheduled to be conducted as a combined meeting, but due to COVID-19, two sessions were held on opposite sides of the border, with identical meeting objectives. The workshops were made possible with funding from the Blue Action Fund, Wildlife Conservation Society and WIOMSA. They were two day sessions and were used to identify stakeholder values, develop the TBCA vision, and define conservation targets. They allowed for an in-depth discussion of the existing state of marine ecosystems and species and the threats to them. Also discussed were the actions that must be taken to materialize the TBCA and implement proper management of the Kenya–Tanzania transboundary marine systems.

The meeting participants on each side (totalling over 40 and including researchers, representatives of non-governmental organizations, local communities and government officials) particularly welcomed the idea of collaboration in the management of transboundary marine resources and identified additional opportunities to enhance cooperation on conservation of important marine areas and species.
What defines the western Indian Ocean?
The natural beauty and diverse ecosystems, both on land and in the water? The unique potential the vast marine space offers for sustainable use of its resources, for the benefit of the coastal communities? The threats those ecosystems are facing under a warming climate, pollution and unregulated fishing activities?

For us, at WIOGEN, it is all that but even more – it is the people of the western Indian Ocean. Therefore we were delighted to, with the support of our invaluable partners such as WIOMSA, the Nairobi Convention and the German development agency, GIZ, launch the first virtual WIOGEN Ocean Governance Conference from 27 to 29 October. Our goal was clear: to showcase the excellent work that is being done in the region, often by wonderful early career researchers who have the future of the region in their hands.

We were delighted that more than 350 people registered for this three-day virtual event that included over 50 presentations of a truly transdisciplinary nature. All coastal and marine ecosystems were included, from mangrove forests and coral reefs, all the way down to the deep sea.

The first day was intensive but inspiring, with parallel sessions that covered sustainable fisheries and aquaculture; biodiversity, conservation, habitat loss and pollution; and legal and institutional analysis. Angelique Pouponneau, our first keynote speaker joined us from Glasgow where she was preparing for the Glasgow Climate Change conference. She highlighted the importance of stepping out of our comfort zones and working across silos for integrated ocean management. This is one of the key motivations behind the WIOGEN network. Anna-Katharina Hornidge, one of the founders of WIOGEN, joined us for the second keynote of the day, speaking on science for the future and covering topics from inequality, COVID-19 and, of course, ocean governance.

We hope that WIOGEN is achieving what she hoped it would when designing the project.

We strive to be inclusive and supportive of all scientists, policymakers and decision-makers in the region, and this conference is just one of the ways we are doing this. We have been working with early career researchers to develop their research outputs and have run training on stakeholder engagement, policy brief writing, social media for scientists and marine spatial planning.

We are also very excited about the ocean governance special edition of the Western Indian Ocean Journal of Marine Science that will be an outcome of this conference.

A screenshot of workshop participants
Day two the WIOGEN Ocean Governance Conference continued with Alexandra van Hoek of GIZ’s MeerWissen Initiative welcoming the participants. The idea of a completely co-designed, member driven network is a novel concept and relies heavily on the participation and input of its members. We would like to think that they have no regrets seeing the enthusiastic response to this conference and all the activities that have taken place in WIOGEN over the last two years. MeerWissen is an initiative of the German Federal Ministry for Economic Cooperation and Development (BMZ) that seeks to provide policymakers with the scientific information they need to take decisions for the effective management and conservation of Africa’s ocean and coasts. There is a new call for funding, so if you have a project in mind, contact them to find out more.

Rashid Sumaila joined us from Canada to inspire and challenge us to consider the value of our oceans, the threats they face and how to think about fish as an infinite resource – and treat it accordingly! His new book is available, and we consider it highly recommended reading! After all, “if we take care of this wonderful ocean, we will be able to have fish to infinity ... the resource will also then take care of us.”

Our parallel sessions covered a diverse range of topics from deep sea research, co-design and transdisciplinary research to the Sustainable Development Goals, marine spatial planning and ocean accounting.

Our afternoon plenary really captured the essence of WIOGEN, with discussions on borderless nature and science, African ocean governance strategies, regional cooperation and looking forward to the UN Ocean Decade. We were honoured to close off the day with a recording from one of the key members of WIOGEN, working group lead, Paubert Mahatante, who is a shining example of moving from science to policy, having recently been appointed Minister of Fisheries and the Blue Economy in Madagascar. He is an inspiration to us all and we are honoured to call him a colleague.

We welcomed an opportunity to showcase two of the other networks in the region. Riaan Cedras explained how the Western Indian Ocean Early Career Scientists Network (@WIOECSN) is building capacity and partnerships for early career scientists in the western Indian Ocean, and Obakeng Molelu highlighted the importance of mentorship and networking for women in marine science through the Women in Marine Science network. We hope collaboration amongst all the networks in the region creates a supportive environment for communication, interdisciplinary research and results in the western Indian Ocean region becoming a hub for ocean governance excellence.

If you were not able to join the conference in October the recordings are now available on the WIOGEN Youtube-Channel – also for those who wished to be able to be in multiple sessions at once!
WIO-ECSN AT THE WIOGEN OCEAN GOVERNANCE CONFERENCE

The virtual WIOGEN ocean governance conference brought together leading academics, researchers and policymakers to provide rich knowledge pools in which ideas were exchanged and future collaborations emerged. A number of members of the Western Indian Ocean Early Career Scientists Network (WIO-ECSN) presented papers at the conference and share their experiences here:

Riaan Cedras: Networking with networks

At the WIOGEN virtual conference, our network sponsored a 30-minute coffee break session that allowed for an exchange of ideas about ocean governance. Early career researchers were able to share their research and experiences in law, sustainable fisheries, aquaculture and deep-sea research. Beyond the conference, dialogue continued, encouraging a variety of professionals to establish governance of our ocean system that includes indigenous knowledge.

Damaris Kinyua: Fishers’ perceptions of billfish resources use along the Kenyan coast, implications for management and governance

I had the opportunity to present part of my PhD research findings on billfish resource utilization at the WIOGEN conference. My research examines the fishing behavior, views, and attitudes of artisanal billfish fishers toward the institutional regulation of billfish resource use. Preliminary findings indicate that the institutions have gained acceptance and that the various groups’ functions have become more effective over the years. This research highlights the importance of developing synergy among all stakeholders involved in billfish resources, hence improving management success, and addressing potential conflicts between user groups. Read the abstract.
Frank Mirobo: The impact of shark liver oil trade on the conservation and management of threatened shark species in Zanzibar, Tanzania

My study aimed to determine the impact of the shark liver oil trade in the conservation and management of threatened shark species in Zanzibar, Tanzania. A major finding of this study is that it is not only the shark fin trade that has an impact on the overexploitation of shark species, but also other shark products, including shark liver oil trade. Immediate intervention is highly recommended. In this conference my presentation was one of the best and I received a student prize (https://wiogen.org/student-prize-winners/). Read the abstract.

Jean Aimé Zafimahatradraibe: Local governance of marine resources in Madagascar: role of the local manager and the responsibility of the co-manager in marine protected area governance

The findings show that the local governance groups have authority, mainly in terms of legal recognition, but they have low capacity to make decisions and to implement their conservation action. My research analysis suggests that the responsibility of the co-manager should be to build the capacity of local governance groups and develop an exit strategy for the co-manager. The role of the local governance groups is to focus on promoting local initiatives, improving their capacity and encouraging and motivating their staff. Read the abstract.

Erica Tovela: DNA barcoding as a tool for species identification of the genus Lethrinus in Mozambique

The main objective of the study was to barcode all the species and provide an accurate fish differentiation in four study areas in Mozambique: Inhaca and Bazaruto Archipelago in the South of Mozambique, and Ibo Island, Mecufi and Memba in the north. Nine species were identified. Two species are new to the country, namely Lethrinus borbonicus and Lethrinus sp. It is recommended that more samples be collected and analyzed to ensure greater robustness in the results and better species differentiation. Read the abstract.
Alessia Dinoi, Aina Le Don Nomenisoa and Gildas Todinanahary: WIO Marine Ecosystem Services Valuation: A systematic review of current outputs, gaps, methods, and future directions

This research highlights the importance to have an appropriate marine ecosystem services valuation for each WIO country. The choice of a clear goal, an appropriate methodology and involvement of numerous stakeholders, can provide transparent and free data for each ecosystem services usable for short- and long-term policy making and monitoring environmental changes. Read the abstract.

Fadhili Malesa: Spatio-temporal variation of zooplankton and fish larvae community structure in different seagrass areas of Tanga coastal waters, Tanzania

Results indicated a difference in zooplankton and fish larvae taxonomic group density (No.s m-3) between seasons- higher during the southeast monsoon than in the northeast monsoon. Healthy seagrass subsites showed higher fish larvae density than degraded subsites. Nonetheless, zooplankton distribution could not be linked directly to the heathy status of seagrasses in the sampled areas. Read the abstract.

WIO-ECSN IN THE MAURITIUS CORAL REEFS RESEARCH WORKSHOP

By Deepeeka Kaullysing and Frank Mirobo

In an effort to share maximum information with the younger generation and first year students at the University of Mauritius, our country coordinator Deepeeka Kaullysing assisted with the organization of a virtual training workshop on coral reefs research in Mauritius.

The workshop was held from 18 to 20 November 2021, led by Associate Professor Ranjeet Bhagooli of the University of Mauritius. Two world renowned coral reef research scientists, Dr Tim McClanahan and Dr Nyawira Muthiga, from the Wildlife Conservation Society in Kenya, and local reefs scientists from several organizations presented their research work. Our network vice-chair Mouneshwar Soondur highlighted the WIO-ECSN activities being carried out in the region and encouraged early career scientists who are passionate about coral reef sciences in Mauritius to join our network. The event attracted the interest of more than 70 early career scientists in Mauritius.
Marine litter is one of the leading global crises and there is a need for immediate action to eradicate the problem. The Arena Recycling Industry, a startup company that recycles plastic waste into building materials, in partnership with the Women in Recycling Foundation, Sustainable Ocean Alliance Tanzania, MBRC the Ocean Foundation, and Msasani Beach Management Unit, teamed up with WIO-ECSN-Tanzania to organize a beach clean-up at Msasani beach in Dar es Salaam. The event aimed to generate awareness among the fishers and local communities in Msasani Beach on the effects of marine litter on marine organisms and the importance of regular beach clean-ups. This event was funded by Youth for Water and Climate. The event brought together more than 70 people who collected 444 kg of waste, while over 1 000 people were educated directly during the event and virtually through the media. This event was the first of many planned beach clean-ups.

“"The event aimed to generate awareness among the fishers and local communities in Msasani Beach on the effects of marine litter on marine organisms and the importance of regular beach clean-ups.""
Fisheries support the livelihoods and well-being of millions of people around the world. In Kenya, the coastal fishery supports more than 23,000 fishers catching over 16,000 tonnes of fish annually. The fishery is considered one of the key sectors that provides monetary income and animal protein to about 70 percent of the coastal communities. During the past eighteen months, the COVID-19 pandemic has massively altered the sector – increasing vulnerability, and exposing weaknesses in fisheries food systems at both local and international level.

To curb the spread of COVID-19, the Kenyan government implemented over 120 different policies spanning eight categories; restrictions on population movements represented about 40 percent of the policies, mostly comprised of travel bans, curfews and bans on public gatherings. So, how did COVID-19 impact Kenyan fisheries? And what did fishers and traders do to cope? In a recent study, commissioned and funded by WIOMSA, we interviewed fishers, female and male fish traders, and community leaders across five coastal communities to find out about COVID-19 impacts on markets, livelihoods, food security and well-being, and what they did in response. We found fishers, fish traders, and coastal communities are experiencing severe livelihood and food security challenges in the face of COVID-19.

**Disrupted markets, livelihoods and changing fishing dynamics**

COVID-19 severely impacted food security in all communities and greatly disrupted local market dynamics at landing sites within the communities, and connections to more distant markets. All households told us they ate less (reducing meal sizes or skipping meals altogether), and ate less well (consuming less meat and vegetables and primarily consuming staple carbohydrates such as ugali). Although foods were available in shops, they were unaffordable because of reduced cash in the communities. People reported that these changes were starting to have health impacts.
Impacts of COVID-19 on markets, livelihoods, and well-being in fisheries in coastal Kenya

**Highlights from recently published paper**

The overall demand for fish sharply reduced and prices fell for many species, particularly those that are important for the hotel, restaurant and catering industries. The drop in demand, and in some cases big price drops, put a halt to or reduced the activity for many fishing fleets; their work became unprofitable. Fishers were also constrained when industry suppliers (e.g. ice, gear, bait) closed, or stopped providing credit.

**Impacts on well-being**

**COVID-19 disrupted communication and connections with other fishers, traders and customers – a major source of social support.** It also affected material well-being; there was a loss of income and a lack of cash across all communities. Several people had lost jobs, or knew people who had. Many said that the COVID-19 situation was very difficult, and that they were simply hoping for the pandemic to end quickly.

**Government interventions and coping strategies**

To cushion vulnerable communities, such as those involved in fishing and fish processing, the government of Kenya prioritized the provision of direct financial assistance, including cash stipends via mobile funds transfer, relief food and tax relief. Although some traders received a small portion of aid in the form of food, others experienced delays, confusion or absence of support. Most households coped with the shocks of COVID-19 by decreasing the variety and quality of food they ate, to conserve money. People stopped buying in bulk, used up existing savings, borrowed money (when there was still enough money in the community for people to lend), or swapped fish for goods directly. None of the strategies people took could be sustained long term.

**Next steps for policymakers**

Our study highlights how each stage of the fisheries supply chain – from catch, to trade, to consumption – is susceptible to disruptions from COVID-19. Only by protecting each stage of the supply chain can human consumption of fish and fish products be achieved. We further emphasize the need to harness financial, human and technical resources to support fisheries recovery, and at the same time to efficiently roll out vaccination programmes and then responsibly re-open the economy to domestic and international markets.

**read the full paper:**


Available Here
In a recent article released on 24 September 2021 in the Marine Pollution Bulletin journal, a team of scientists from the University of Mauritius reported on the status of meso-litter and microplastics along the beaches of Mauritius.

The study forms part of the regional marine litter monitoring programme funded by WIOMSA in collaboration with the Sustainable Seas Trust through the Africa Marine Waste Network and partners in Kenya, Tanzania, Mozambique, South Africa, Madagascar, Seychelles, including Mauritius. The main aim of this programme is to set baselines to meet the Sustainable Development Goal 14, and specifically target 14.1 “by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution”.

The article reports on the densities of meso-litter (size range 5–25 mm) and microplastics (plastic particles <5 mm in size) at twelve sandy beaches around the island of Mauritius. It highlights the relatively high percentage of plastics components (up to 70%) among meso-litter sampled. The origin of meso-litter was mainly “anthropogenic” in nature, and mostly related to “shoreline and recreational activities” (approximately 75 percent) followed by “smoking-related” activities. Most common plastics meso-litter items encountered were pieces of food wrappers, cigarette butts, filters and hard plastic. Plastics polymer type was investigated using FTIR and the most common plastics polymer was polyethylene (PE). PE is the most used plastic in the world and a common composition of food containers, food bottles, wrappers and bags. Among the different types of microplastics, “fragments” were the most encountered (approximately 75 percent) in the beach sediment. The highest microplastics densities were found on wind-exposed sites mainly on the east and southeast of the island and near the vegetation line/berm zone.

Findings of the study can be used as a baseline for future monitoring and to check the effectiveness of marine litter and plastics management and control strategies in the local context. More rigorous beach user awareness campaigns on beach littering and smoking-related activities, and stringent control of the sources and origin of marine litter (macro, meso and microplastics) is recommended.

READ THE FULL PAPER:
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For more information on the WIOMSA Marine Litter Monitoring Programme:
Click here
The EACC flows along the coastlines of Tanzania and Kenya encompassing a largely oligotrophic environment, which is nonetheless characterized by rich and diverse marine ecosystems and habitats. More than 16 million people currently live along the EACC coastline, a number expected to double by 2030. Some coastal communities experience the highest rates of poverty in the world and are highly dependent on the ocean for economic stability, food security, and social cohesion.

Strong fluctuations in key fisheries occur in the region, due to the combined effects of climate change, natural ecosystem variability and overfishing. Understanding and managing fisheries under the growing threat of climate change and food insecurity in the region requires good understanding of the marine environment, key environmental controls on local ecosystems and economic and social factors affecting the dependence of the coastal population on marine resources. However, the EACC region is one of the most poorly sampled and analysed marine domains in the world, due to both restricted regional marine research capacity and, in recent years, the challenges of marine security (piracy) which has impeded international research expeditions.

The Ocean and Coastal Management special issue is an international and interdisciplinary collaboration of 79 co-authors (40 from countries listed as least developed by the Organisation for Economic Co-operation and Development).
The National Oceanography Centre’s (NOC) Dr Stuart Painter, lead editor for the special issue said: “The SOLSTICE-WIO project presented many opportunities for collaborative research with researchers in Tanzania and Kenya. This proved fruitful in several ways but the opportunity to work in poorly understood marine waters on inter-disciplinary problems with immediate societal implications has been hugely rewarding.”

The special issue is an output of the SOLSTICE-WIO project, a four-year collaborative project, funded by the Global Challenges Research Fund (GCRF) and led by the NOC, with partners from the United Kingdom, South Africa, Kenya and Tanzania. SOLSTICE-WIO, which commenced in October 2017, has brought together advances in marine technologies, local knowledge and research expertise to address challenges facing the western Indian Ocean through technology transfer, collaborative environmental and socio-economic research and training.
A study published in *Conservation, Science and Practice* in September 2021 focused on the status of endemic and rare corals and reef fishes of Mauritius.

This collaborative work was undertaken by local, regional and international scientists including Tim McClanahan, Josheena Naggea, Ranjeet Bhagooli and Vikash Munbodhe.

The study primarily assessed the occurrence, distribution and abundance of endemic and rare coral and reef fishes in the lagoon and off-reef of Mauritius island. Many species are unique and are named after Mauritius, such as the Mauritian Gregory, Mauritian anemone fish, and the Mauritian and Creole damselfish. These last two species were not found in the study of 119 sites and could therefore be locally extinct, pending further in-depth investigation. The study also highlighted the fact that there are many potential threats to these species. Most species have small populations and limited habitats and are restricted to a certain part of the island. While the reef health is jeopardized, both the abundance and diversity of corals and reef fish assemblages are declining, potentially causing both thermally vulnerable corals and coral-dependent fishes to become threatened, locally extinct or globally extinct, if they are endemic.

The study took a unique approach by assessing the perceptions of 1,000 Mauritians in 27 villages on the environment and conservation of marine endemic species. Moreover, 11 diving centers participated in the study, along with non-governmental organizations (NGOs) and the university. This effort has resulted in a nationwide assessment of endemic and rare corals and reef fishes of Mauritius.
reef fish, as well as people’s perceptions of the environment. Of the 10 endemic fish studied, the more abundant rare species were the Mauritian Gregory and the Mauritian clownfish, while the Mauritian and the Creole damselfish were hardly observed at the studied sites.

Six species of coral studied are found only in the western Indian Ocean but not only in Mauritius. Besides *Acropora branchi* and *pocillopora indiana*, the other four corals studied were not abundant.

It is expected that a citizen science programme, with the help of the local diving industry, NGOs and universities can help find the missing species of corals and fish at the local level and also extend the search to Reunion and Madagascar.

The study also endeavoured to contribute to the strengthening of the marine spatial plan and updating of the National Biodiversity Strategic Action Plan for the Convention on Biological Diversity.

OVERALL, THE STUDY HAS PROVIDED:

- a baseline on the status of corals and reef fishes of Mauritius
- the occurrence, distribution and abundance of endemic and rare coral and reef fishes
- created an interest and awareness in the community on the endemic and rare corals and reef fishes
- provided vital science-driven information to reinforce the current conservation strategies for better reef resilience and for a proper update of the IUCN Redlist for Mauritius.

READ THE FULL PAPER: Available Here
Survival of the Richest, Not the Fittest: Attempts to Govern African Fisheries Impact Small-Scale Fishers the Most | By Nelly Kadagi

The growing demand for seafood has attracted various actors to African waters, including the fleets of distant water fishing nations (DWFNs), resulting in declining fisheries, illegal, unreported and unregulated (IUU) fishing and precarious fishing-dependent livelihoods.

To address these impacts, African governments and their international development partners deploy a set of governance mechanisms such as anti-illegal fishing patrols by navies, closed seasons, marine protected areas (MPAs), and reducing inshore fishing zones.

Drawing on on-the-ground experiences, a review of literature, fisheries databases, international and regional agency reports, NGO and government reports and case studies from Ghana, Liberia, Madagascar and Somalia, our research published in Marine Policy concluded that governance mechanisms fail to address the unsustainable activities of the DWFNs and industrial fleets (“the richest”) to the detriment of the “fittest” – the small-scale fisheries (SSF).

Our review of Ghana as a prime case study demonstrates how the misapplication of a fisheries governance mechanism through securitization targets the most vulnerable small-scale fishers, who are least able to resist, and easiest to police, while favouring the elites who have interests or investments in the industrial fleets, especially those from DWFNs, or the revenues they generate.
The case study of Liberia shows the elitist influence on political, socio and economic elements of fisheries governance, which is apparent in how government actions marginalize the visible – SSF – while elevating the unsustainable actions of the elites – the industrial sector.

The case of Madagascar illustrates the unequal power dynamics between the Malagasy government and their external partners which limits the application of an equitable fisheries governance mechanism to address the real issues – even in the face of threatened livelihoods and depleted resources. Somalia as an emerging fishing ground for DWFNs is a useful example in highlighting the need for the government to turn inwards to develop the SSF while addressing the real fisheries governance issues, that is, sustainability problems further offshore. Otherwise, the blue economic agenda focusing on fisheries development for the industrial sector will be counterproductive.

These case-studies emphasize the notion of the “survival of the richest, not the fittest”, whereby fisheries governance mechanisms support the activities of the industrial sector, whilst diminishing the SSF. This reinforces the elitist perspective of fisheries governance whereby those that are vulnerable to the impact of depleting fish stocks do not have the capacity to influence policy.

We recognize that difficult decisions must be made to address the existential threat of depleting fish stocks, destabilizing impacts of maritime crime and rebuilding the economy post-Covid-19. Nevertheless, current efforts to govern fisheries resources in the “blue economy” must be effective and redirected offshore to address the negative implications of industrial fisheries, especially those of DWFNs. An opportunity exists for African governments to create meaningful and well-implemented participatory fisheries governance measures that are inclusive of multiple stakeholders, while ensuring that fishing grounds and coastal zones for SSF are sustained in the face of competing priorities.

**READ THE FULL PAPER:**


Available Here
Over the years, fishers in East Africa have adopted a tradition of migrating away from home in search of productive fishing grounds, but the social and economic pathways of how this fisher migration influences their livelihoods is not well understood.

Now, a MASMA-funded study has shown that fishers who expand their “space” beyond the boundaries of their community of origin achieved various outcomes, including livelihoods and governance outcomes. The study focused on the landing sites of Kipini, Gazi, Shimoni and Vanga-Jimbo in Kenya.

According to the findings of the study, migrant fishers’ livelihood was a function of the spatial characteristics at their destination, which depends on the specific landing site, market, social relations and the migrant fishers’ integration into society. Existing policies, institutions and processes at destination determined market availability and prices, while good returns influenced access choice. This combination of factors in turn influenced the sustainability of fisher livelihoods. Social networks at the migration destinations, such as traders, relatives and local community are an important entry point. Large numbers of migrant fishers visit destinations because of their suitability, acceptability of local fishers and local fisheries leadership who received them on fulfilment of given requirements that included gear type, crew size as well as payment of landing fees.

Landing site significantly influenced the price of fish, with access to cold storage infrastructure catalyzing higher fish prices. Distance to market also significantly influenced the price of fish, while migrant fishers in remote areas made use of their extensive market networks to supply various urban and rural areas.
Preferred fish traders guarantee that they will buy all catch landed, which encourages migrant fishers to go to destinations determined by the traders. The nature of the free market is attractive to migrant fishers but this varied at individual landing sites. Migrant fishers mostly targeted pelagic fish. Fishes sold at Kipini market were of the highest value. The migrant fishers’ main obligation was to land high-value catches, while their traders had the duty of identifying appropriate markets and providing invaluable post-harvest services such that catches reached target markets in good condition. For instance, traders of Pemba origin transported fish to an export company in Mombasa every two to three days. Hence distance to the target market did not limit migrant fishers’ access to landing sites.

These findings have implications for management in that it is clear that migrating plays a role in sustaining artisanal fisher livelihoods. Artisanal fishery management should therefore take into consideration the spatial lens, including the social relations of migrant fishers, their marketing arrangements with traders and their role in fish supply chains.

READ THE FULL PAPER:

**The migrant fishers’ main obligation was to land high-value catches, while their traders had the duty of identifying appropriate markets and providing invaluable post-harvest services such that catches reached target markets in good condition.**
The Great Reef of Toliara (GRT), in the southwest is the largest reef complex of Madagascar and the western Indian Ocean and has been a refuge for diverse reef taxa, including 714 species of reef fishes and 135 species of scleractinian corals. It provides both coastal protection and an artisanal fishery for the city of Toliara.

However, like most of the world’s coral reefs, those in Madagascar have been increasingly exposed to various types of natural and anthropogenic disturbances that have worsened their socio-ecological vulnerability and resilience. Overfishing, sedimentation and thermally induced coral bleaching events have particularly affected the island’s coral reefs located around populated cities. All these episodic disturbances and chronic stressors have caused a decline in coral cover and abundance in the last 50 years, particularly for architecturally complex coral taxa such as Acropora and Pocillopora, with coral cover decreasing from about 50 percent to 5 percent during this period in several shallow habitats.

Despite these increasing threats and the general trend of coral decline, no quantitative studies have recently examined the spatial patterns and community structure of coral assemblages, thus precluding a precise indication of the current status and the resilience capacities of the GRT. In this context, researchers from the Fishery and Marine Sciences Institute of Toliara, Madagascar, the French Institute of Research for Development and the University of La Réunion investigated the spatial patterns and community structure of coral assemblages among major reef habitats in the region of Toliara, including the GRT. Composition, genetic richness, cover (including other benthic taxa), and size-structure of coral assemblages were quantified and compared among 10 stations, using the most recent monitoring methods and data analysis.
Overall, benthic substrate was dominated by hard corals (46.8 ± 3.4%, mean ± SE), turf algae (17.3 ± 3.8%), macroalgae (12.7 ± 4.0%), and rubble (12.1 ± 4.9%). Acropora colonies dominated the coral cover (>50% of overall coral cover), with the highest values recorded at the inner slope (37.9 ± 15.4%) and, to a lesser degree, at patch reefs (28.8 ± 6.9%), whereas cover was lower at the outer slope (12.8 ± 2.7%). Pavona cover was also high at the inner slope (27.2 ± 13.1%), whereas values were greatly reduced at patch reefs (1.5 ± 0.5%) and the outer slope (1.1 ± 0.5%). Percent cover of other coral genera was lower than Acropora and Pavona (<7%).

The composition and abundance of coral assemblages showed a significant difference among the three habitats. Stations of the outer slope were characterized by higher abundance of Acropora and Galaxea.

In terms of colony abundance, the results highlight the marked dominance of Acropora, which is another sign of the recent recovery to healthier coral assemblages at the study sites. In fact, Acropora, which was dominant in the GRT in the 1960s, was greatly reduced in cover and abundance in 2008, to the benefit of more resistant taxa such as Porites and Echinopora. There is also an abundance of other branching taxa such as Seriatopora, Pocillopora, and Stylophora, all characterised by their susceptibility to variation in environmental conditions, notably to thermally-induced bleaching events.

This study has important implications for urgently needed management and conservation of the GRT. Indeed, the marked spatial variation that was recorded suggests that conservation measures, such as the implementation of marine protected areas (MPAs), should integrate sufficient area to capture the scale of this spatial heterogeneity. This aspect is critical, as MPA effectiveness can be obscured by important variations at small spatial scales, despite similar adjacent habitats showing opposite trends. The health of the GRT and nearby coral reefs requires a drastic reduction in the fishing pressure in the area. This may be achieved by increasing the number of community-based aquaculture projects that have shown to be a successful alternative, or even principal source of income for some coastal populations and which may reduce the negative effects of overfishing on coral communities. Furthermore, the results suggest that reef restoration activities should consider at least the genera Acropora, Pocillopora, Seriatopora, and Stylophora. The community-based coral farming and restoration activities, whose technical and social feasibility has already been demonstrated, could also improve education and awareness on the importance of corals for healthy coastal ecosystems and, consequently, on their income-generating activities.

The outcomes of this survey, performed within the International Mixed Laboratory and by the Coral Reef Research, Education and Conservation Team of Toliara, bring hope for the future of coral assemblages of the GRT by suggesting that these assemblages still have acceptable maintenance capacities. Yet, adequate and rigorous conservation actions should be taken rapidly to limit and mitigate the local impact of disturbances that are unfortunately inevitable.

**READ THE FULL PAPER:**

Available Here
If you live by the coast in the tropics, chances are you are accustomed to the bustling coral cities that exist in the uppermost meters of our ocean which are easily accessible by snorkeling or SCUBA diving.

You are also likely well-acquainted with the variety of services that those coral reefs provide, including coastal protection, fisheries – they act as nursery grounds for iconic species such as reef manta rays – and are key for a range of ecotourism activities. This appreciation has meant that coastal nations have for decades strived to conserve and protect these unique habitats. We forget, or are perhaps unaware, that there is life and unique habitats in our oceans beyond the depth limit of recreational SCUBA diving (30 to 40 m). If you dive deeper and adventure further, you will be greeted with semi-lit to completely dark reef habitats that are every bit as important to humans and the health of our planet as their shallow-water counterparts.

Mesophotic coral ecosystems (MCEs, 30 to 150 m) and rariphotic reef habitats (150 to 300 m), henceforth referred to as “deeper reefs”, are widespread throughout the tropics and subtropics, including the western Indian Ocean. Deeper reefs harbour unique biodiversity, reflecting organism adaptations to the unique prevalent environmental conditions, such as gradual loss of light and hence the ability to photosynthesize, increasing pressure, and decreasing temperature. Much like shallow reefs, deeper reefs too, provide essential goods and services including food production, nutrient cycling, and refuge for some shallow-water corals and fish, including commercially important species, affected by shallow-water disturbances.
Nevertheless, deeper reefs remain largely unexplored, due to cost, logistics and a general perception that they face fewer threats. Consequently, at present only a few datasets are available from these habitats, and these are rarely used to inform management and conservation activities. The lack of protection afforded to these habitats may have long term repercussions because, as is the case with shallow reefs, they are affected by overfishing, pollution and climate change.

To better understand the perceptions people have of deeper reefs, and if and how deeper reefs are included in the design, designation and management of MPAs in the western Indian Ocean, a study is being conducted between Nekton, University of Oxford and Conservation International by Paris Stefanoudis, Sheena Talma, Dr Lucy Woodall (Oxford/ Nekton) and Daniel Wagner (Conservation International).

To undertake this study we developed a three-tiered process. We first collected information inherent to the design, designation and management of MPAs in the WIO and in relation to deeper reefs using an online questionnaire that was circulated to western Indian Ocean stakeholders. This was followed up by a series of longer-format, online semi-structured interviews with interested stakeholders in order to add more nuance to the findings of the first online survey. We were privileged to speak to a host of different policymakers, academics, conservation practitioners and MPA managers from Comoros, Kenya, Mozambique, Seychelles, South Africa and Tanzania.

Subsequently, we developed and distributed a second online survey, summarising key findings from the semi-structured interviews, and categorising them into the following four themes: science, capacity, outreach and education, and MPA planning process. For the first three themes we also presented recommendations made during the interviews that would aid the consideration of deeper reefs in MPA planning, and asked participants to provide feedback as well as rank them according to their priority. We are now in the process of co-identifying with interested stakeholders a list of practical actions that would complement these recommendations.

**THE AIMS OF THE STUDY ARE TO:**

- review MPA characteristics and determine data use patterns in relation to planning
- identify whether there were existing biases about deeper reef systems
- co-develop with regional stakeholders practical recommendations for inclusion of deep reefs in future management strategies.
Results from all surveys are currently being processed and will become available in the next months, but we can share that the majority of participants regarded deeper reef data important in informing MPA planning. Despite this, several MPAs extending deeper than 30 m did not consider deeper reef data during planning. This was largely because such data was not available, due to lack of equipment and affordable technology that would allow exploration of deeper reefs.

Sheena Talma is the Nekton Science & Knowledge Exchange Programme Manager. She has a keen interest in learning more about how we use the ocean and the implications of overfishing, marine pollution and climate change in that relationship.

Whilst the expertise of performing and being involved in deeper reef research varied between countries, there was shared ambition and a desire among the participants to better understand deeper reefs and ensure their consideration in MPA planning.

Paris Stefanoudis is a senior postdoctoral researcher at the University of Oxford, working with the UK-based NGO Nekton. His research has a marine biodiversity and conservation focus, having worked in projects focusing on the High Seas, Bermuda, Seychelles, Comoros and the wider Western Indian Ocean region.
PUTTING COMMUNITIES FIRST IS KEY TO AN EQUITABLE AND JUST 30X30

By Steve Rocliffe

All eyes have been on COP 26 in Glasgow and the world’s attempts to curb greenhouse gas emissions and avert catastrophic climate change. But 26 isn’t the only COP in town, nor the only major meeting focused on ensuring our planet is liveable for generations to come.

COP 15, the United Nations biodiversity conference in Kunming, China, may not be capturing all the headlines, but it is every bit as crucial for life on earth as its Glaswegian sibling.

The conference, delayed repeatedly by the COVID-19 pandemic, is taking place in two parts – online in October 2021 and in person in April 2022. It is bringing together 196 nations and territories and is billed as one of the last, best opportunities to halt biodiversity loss and put the world’s lands and oceans on a pathway to sustainability. At the top of the agenda is a new rescue plan for nature. Known as the Global Biodiversity Framework, it will replace and extend the current plan with its 20 Aichi Biodiversity Targets, agreed in 2010.

As part of this process, Aichi Target 11, concerned with establishing effective, equitable and globally representative systems of protected areas covering 10 percent of the ocean and 17 percent of land by 2020, is set to be replaced with an ambitious new goal: 30x30. Simply put, 30x30 seeks to protect 30 percent of the planet by 2030. The goal is backed by large non-profit organizations and governments all over the world, including the G7 group of wealthy nations (though not, notably, China). There are good reasons for this support.

We know that when properly managed and funded, protected areas can create win–wins for people and nature alike, replenishing fisheries and strengthening local livelihoods.
Putting communities first is key to an equitable and just 30x30

They are one of the most valuable tools we have to combat climate breakdown, coastal poverty and the damaging effects of industrial fishing.

**We urgently need more of them, and we urgently need to make sure existing areas live up to their promise.**

Yet 30x30 has been met with hostility and suspicion by many human rights activists and researchers. Our sector, they point out, has a long history of forcing people from their lands and fishing grounds in the name of conservation, often violently. As such, trying to protect more of the planet risks more of the same: more violations of fundamental human rights, more conflict, more violence, with these impacts falling disproportionately on those who are the most marginalized and least responsible for the biodiversity crisis.

**30x30 thus holds both enormous potential, and enormous peril. How can we maximize one and minimize the other?** How can we ensure that fundamental rights aren’t extinguished and equity undermined in the rush to deliver the additional conservation our ocean so badly needs?

We believe that the solution starts with accepting that the best way to protect nature is to protect the human rights of those who live with it and depend upon it. In practice, this means recognizing the centrality of indigenous peoples and local communities to conservation success and developing a robust framework to monitor human rights and equity-focused dimensions. It means recognizing that local or collaborative stewardship through other effective area-based conservation measures should be the principal mechanism by which conservation is achieved in nearshore waters. It means secure tenure rights for all coastal communities.

It means an explicit commitment to ensuring that the burdens and benefits arising from protection are shared justly and equitably. It means recognizing and protecting human rights in general, as well as the specific rights of particular groups such as women and youth.

**It means sustainable, flexible long-term funding for community-based initiatives,** simpler legal frameworks and democratizing fisheries data – using digital tools to transform access to information, allowing communities to adaptively manage and rebuild their fisheries.

It means establishing open, robust and internationally recognized grievance mechanisms to resolve tenure disputes and ensure community voices are heard and elevated at the international level.

Finally, it means recognizing and respecting the rights of communities and indigenous peoples to not participate in the 30x30 process and not have their territories designated as protected areas.

Ultimately, 30x30 is an unrivalled opportunity to halt biodiversity loss, safeguard human rights, and put the world’s oceans on a pathway to sustainability. But it can only succeed if it emphasises the primacy of human rights and puts communities first. Achieving all this won’t be easy, but it is key to a 30x30 that benefits people and nature alike, delivering sustainable fisheries, vibrant oceans and improved food security for over a billion people.
The 2020 WIOMSA Annual Report

WIOMSA is pleased to announce the publication of its 2020 Annual Report, which details the Association’s activities in a year marked by COVID-19 challenges and a period of transition. Despite the unprecedented challenges, WIOMSA has worked hard to adapt and seize new opportunities, as well as re-evaluate numerous aspects of its operations, in order to ensure the continued delivery of high-quality products and services. The 2020 Annual Report summarizes WIOMSA’s work and impacts in 2020, with a focus on “Advancing the UN Decade of Ocean Science for Sustainability and the UN Decade of Ecosystem Restoration”. The report features a special “WIOMSA 25 year photo diary” which showcases the Association’s history in photographs!

FEEDBACK FROM OUR COMMUNITY

“Congratulations on producing yet another outstanding Annual Report. It looks great, is on time and has interesting content. I know this is a tough task, so well done to the team.” – Rudy van der Elst, South Africa.

“Many congratulations to WIOMSA! This report is full of fascinating news and the layout is highly attractive... very professional!” – Ian Bryceson, Norway.

“I would like to use this opportunity to express our heartfelt thanks to Julius. He has been the backbone of WIOMSA for the past 25 years and he has worked with different elected Board of Trustees. Members will always remember Julius as somebody who has always been accommodating and humble and somebody who has always had the interest of WIOMSA at heart. Julius has foregone his academic and research career to assist WIOMSA but he never mentions it. Such was his commitment to our organisation. Thank you very much Julius and we wish all the best to Arthur.” – Mitrasen Bhikajee, former Vice-President and Honorary Member of WIOMSA.

“Julius was a WIOMSA pillar - a dependable pillar, an innovative pillar, a source of positive energy and a good friend to many. He will always be dependable regardless of his station in life, and WIOMSA will always have a dependable “go to” docking station whenever they run low on positive energy!” - Dixon Waruinge, Nairobi Convention
Measuring multidimensional climate risks in East Africa’s coastal cities

WIOMSA, in partnership with the Stimson Center, has released a new report Measuring multidimensional climate risks in East Africa’s coastal cities, which includes case studies from Dar es Salaam, Tanzania and Mombasa, Kenya. The report was launched at COP 26 in Glasgow, Scotland on 3 November. At this event, the Climate and Ocean Risk Vulnerability Index (CORVI) team, led by Sally Yozell, was joined by Andrew Komba from the Vice President’s Office in Tanzania on a panel which spotlighted the findings from the report and discussed climate risk to coastal cities.

The report provides a detailed assessment of how climate change is impacting East Africa’s coastal cities. It’s findings are based on 100 surveys and 70 expert interviews. It provides decision makers with a holistic risk picture to help them prioritize action. Both the Mombasa and Dar es Salaam risk profiles showcase how urbanization and climate change are combining to increase vulnerability across the cityscape and provide detailed recommendations to help decision makers balance economic development in coastal cities with the natural environment, all while building resilience to the growing threat posed by climate change.

AN ABBREVIATED VERSION OF THE REPORT HAS BEEN PUBLISHED HERE. Click on these links to access the full risk profiles for Dar es Salaam and Mombasa. Download the completed CORVI East Africa report.

The WIOMSA Magazine Issue 14

WIOMSA is pleased to announce the release of the latest issue of the WIOMSA Magazine: People and the Environment! The special feature of Issue 14 is a story on Kisite Mpunguti Marine Park, managed by Kenya Wildlife Service (KWS), which has just received a gold level Blue Park Award; becoming East Africa’s first ever Blue Park!

“We are excited to see new Blue Park designations accelerating the protection of the most important places in our oceans. Kisite-Mpunguti is a perfect example of an important and richly biodiverse place to protect while at the same time providing local communities with food,” said Dr. Lance Morgan, the President of Marine Conservation Institute. WIOMSA congratulates KWS on this historic award!

The theme of Issue 14 is “WIO Marine Conservation: people, progress, prospects“. The magazine showcases voices of experience in marine conservation offering lessons learnt and best practices from various marine conservation settings in Comoros, Reunion (France), Rodrigues (Mauritius), Tanzania, South Africa, Seychelles, Mozambique and Kenya. Another key highlight of Issue 14, featured in the article Where Giants Roam, is the 7th December 2021 decision of the Government of Mozambique to approve the creation of Maputo National Park. The new park effectively combines the Ponto do Ouro Partial Reserve and the Maputo Special Reserve. Dive in to read this and more stories in Issue 14!

Download the WIOMSA Magazine.
Enabling Local Blue Growth in developing Countries

The Swedish Agency for Marine Water Management is pleased to share our new report *Enabling local blue growth in developing countries*. The report is a thematic review of scientific literature exploring what factors must be in place to support local blue growth in coastal communities in developing countries. Sectors in focus are fisheries, aquaculture, tourism and conservation in marine and aquatic environments.

The review systematically maps and analyses 90 scientific articles. The articles include studies from 28 developing countries in Sub-Saharan Africa, Asia, Latin America and Oceania. It presents eight concrete recommendations to consider by national authorities and development agents working for local blue growth. We hope this study can inspire and contribute to further discussion on the blue economy's potential of creating socioeconomic development in developing countries.

This report is a result from SwAM Ocean, our development cooperation programme. SwAM Ocean aims to contribute to poverty reduction through sustainable use of the sea. Visit SwAM Ocean.

ANNOUNCEMENTS

SHIPBOARD FELLOWSHIP OPPORTUNITY – JULY 2022

Ten early-career scientists and postgraduate students involved in oceanographic work at institutions in the Western Indian Ocean will be selected by WIOMSA to participate in the floating university project, which involves working on the research vessel *Marion Dufresne* during 2022.

The goal of the interdisciplinary, inter-professional and international floating university project named “École bleu outremer, Cap sur l’Océan Indien” is to promote training and capacity building, as well as to train young people in their respective scientific and maritime branches of activity, by allowing them to use the resources and tools provided by R/V *Marion Dufresne*. The project is scheduled to take place in the summer of 2022 in the southwestern part of the Indian Ocean, an incredibly resourceful area in terms of marine biodiversity (coral reefs, seamounts, etc.) All applications should be sent to secretary@wiomsa.org, no later than 20 January 2022. The email's subject should read “Application for École bleu outremer, Cap sur l'Océan Indien, shipboard fellowship onboard research vessel R/V Marion Dufresne”. Female and French-speaking candidates are encouraged to apply. Read more
CALL FOR APPLICATIONS: SCIENCE-POLICY TRAINING

Macquarie University, in partnership with WIOMSA, will be conducting a science to policy training course on 22 to 24 February 2022.

Please contact secretary@wiomsa.org for enquiries on the training.

CONSULTANCY OPPORTUNITY: SCOPING, MAPPING AND SUITABILITY ASSESSMENT FOR SEAWEED AND SEA CUCUMBER MARICULTURE IN THE TANGA-PEMBA SEASCAPE

WIOMSA in partnership with IUCN Eastern and Southern Africa Regional Office through funding from the Irish Embassy in Dar es Salaam-Tanzania, is pleased to announce a consultancy for scoping, spatial mapping and suitability site assessment for seaweed and sea cucumber mariculture in Tanga-Pemba Seascapes and the development of knowledge products.

Interested firms/ independent consultant (s) are requested to submit their application including both technical and financial proposals. The technical proposal should clearly demonstrate their skills and experience for the review process, methodology and approach and a detailed work plan. The applications should be received no later than 5.00 p.m. EAT, December 18th, 2021.

Download the full Terms of Reference.

WIOMSA and Sustainable Seas Trust (SST) are pleased to announce the launch of the Plastics Training Workshop as an interactive online course. Have you ever wished that you had a better understanding of plastics and plastic pollution? Read more
Merry Christmas
Best wishes for 2022

FROM THE BOARD OF TRUSTEES AND STAFF OF WIOOMSA

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