

THE WIOMSA MAGAZINE

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inside

The Women in Marine Science Network (WIMS) has inspired two special editions. In this edition (Part 2) of the series, we feature stories from 12 women from Mozambique, South Africa, Tanzania, Madagascar and Kenya.





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Cover photo: *Karen Bowles* testing the soil core in Mozambique and *Charlotte Aumann* planting *Cerriop tagal* mangrove seedlings with the Chief Conservator of forests in Kenya, during the launching of blue carbon project to the Vanga community

Back cover photo: *Juliet Karisa* Coral reef assessment, in Kyunga, Kenya & *Rebecca Loustau-Lalanne* diving in Seychelles.

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people & the environment

Breaking the class ceiling: stories from women who are making a difference in coastal and marine resource management.

The Women in Marine Science Network (WiMS) has inspired the release of two special editions of the WIOMSA Magazine featuring the stories of women working in the marine and coastal field in the Western Indian Ocean region and beyond.



Part 1 (top left) of the series which was published in November 2019, has received rave reviews from WIOMSA members and partners. In **Part 2** (top right) of the series, we feature stories from 12 women from Mozambique, South Africa, Tanzania, Madagascar and Kenya.



The world is changing

BY REBECCA LOUSTAU-LALANNE

I hope this issue reaches you in a safe and healthy space. I myself am in the Seychelles islands; the smallest African state, which on 26 March 2020 declared 30 percent of its ocean territory as a marine protected area. Sadly, the groundbreaking announcement by the President of the Republic of Seychelles, Danny Faure, coincided with news of the first positive case of COVID-19 in the country.

We are living in turbulent times and as events unfold, many of us fear what the future will look like. Already, we have had to make significant changes to our lifestyles, our working habits and our daily routine.

The world has changed, and as we marked Earth Day on 22 April 2020, I noticed a remarkable number of social media posts celebrating how the natural world was positively responding to a reduced human impact on the environment. The sudden decline in travel, production, distribution and consumption has led to a marked reduction in pollution and greenhouse gas emissions around the globe. As citizens have emptied towns and cities, forced into social confinement by government legislation, nature appears to be showing signs of recovery.

But for how long? Post COVID-19, governments around the world will face considerable pressure to stimulate their economies by reverting to familiar consumptive mechanisms of production and output. Or, could they instead decide to invest in sustainable development mechanisms, ensuring nature-based solutions and enabling



the world to meet the Sustainable Developments Goals?

At the risk of offering a tirade of personal thoughts on these matters, I want to highlight that our world has had to experience irreversible change and we now have to find ways to cope with our new “normal”.

The world is embarking on a new development path, with new social coping mechanisms, new business models, possibly a refreshed outlook on the urgency of the protection of the natural world, and food security measures. Science and innovation will shape the new development policies that world leaders will need.

The marine environment, our blue economy, will be scrutinized even further for solutions, so the work in our region by our marine scientists is crucial. There is a real opportunity for scientists to guide the narrative of the “new normal”. Let us find courage to support one another to make this change happen.

The world needs us to adapt and build stronger resilience and in reading the contributions for this edition, I was struck by the stories of the women of the region who have endured and lived many

such moments. They have shown incredible resilience and provide a clear message regarding their journey, offering honest advice to aspiring young men and women working within the blue economy. Despite their very different stories, their united voice is a continuation of the “golden thread” that Claire Ward highlighted in her editorial for WIOMSA Magazine No.9 and focuses on the importance of determination and collaboration.

The role of mentorship is a key theme and I believe both the network of **Women in Marine Sciences (WiMS) and WIOMSA are in a unique position to provide support and guidance as role models for the Association’s members. WiMS is planning to roll out tailored mentorship courses in the near future and we welcome more ideas and any offers of assistance in our network. (Please get in touch!)**

As we face a post-COVID19 world, with its challenges and opportunities, let us take inspiration from these remarkable women on how to remain focused, be adaptable and how to never lose heart.

Best wishes from a small islander hoping for a brighter and healthier tomorrow.

The path **|** BY RIMA BEESOO from dreams to success does exist

Growing up in the beautiful island paradise of Mauritius, I developed an intimate connection with the ocean at a very young age. This connection was fostered by my parents who taught me the names and habitats of many animals living in the ocean. At school, I was also very passionate about anything related to medical research and I thought getting to know both these worlds would be awesome. This in particular has grounded me deeply as I have moved through life, and it has certainly shaped how I pursue science and what I work on.

It is almost a decade now, but I still remember the day I got my feet wet in the field of marine science when I was selected to work on a very interesting project on drug discovery from marine sponges for my Bachelor degree honour's thesis at the University of Mauritius and the Mauritius Oceanography Institute. Stepping into the marine world and exploring the ocean as a new wave of drugs was simply an exceptional experience. I knew I had found my niche and was more than determined to pursue my dream as a marine biochemist.

Left: Rima collecting marine organisms for extraction of bioactive compounds.



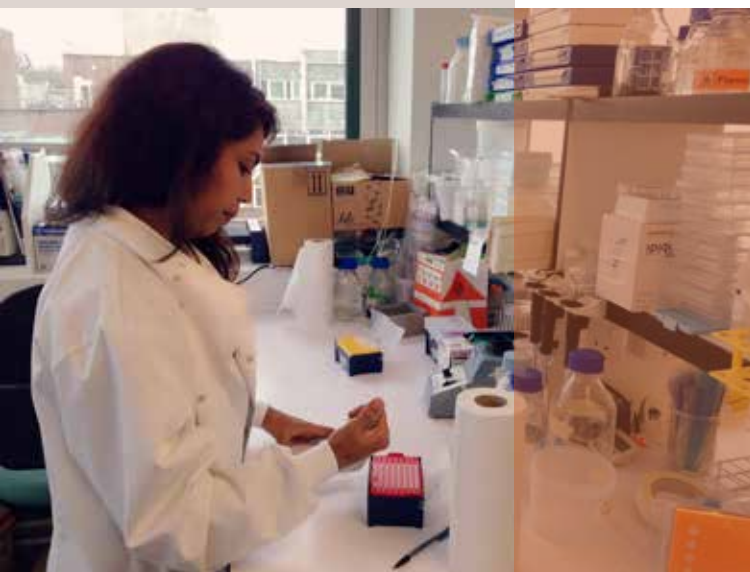
“ Achievement unlocked! Here I am, a proud marine biochemist from Mauritius.

I recently obtained my PhD in applied marine biochemistry at the ANDI Centre of Excellence for Biomedical and Biomaterials Research, University of Mauritius. **My research focused on the identification of marine organisms from Mauritius waters with promising biological activities and of potential relevance in drug discovery.** Bestowed with one of the world's largest exclusive economic zones (2.3 million km²), the Mauritian sea represents a rich biodiversity hotspot with high levels of endemic flora and fauna, which are, as yet, largely untapped. This extraordinary biodiversity offers a myriad of opportunities for bioprospecting novel active molecules with potential applications as pharmaceuticals, nutraceuticals, cosmeceuticals and dietary supplements. So far, my project has earmarked some tropical sponge, soft coral, tunicate and jelly fish species as promising sources of novel compounds with interesting anticancer and antimicrobial activities. I strongly believe that these data will help back-up existing frameworks oriented towards

the promotion and conservation of the biologically diverse and threatened Mauritian marine biodiversity for biomedical research. It will also lay a strong foundation for promoting aquaculture and sustainable production of value-added marine products, in addition to providing opportunities for science diplomacy.

My research journey has been a roller coaster ride, but it has all been worth it! First and foremost, I can share what has worked for me:

strong motivation and a fighting spirit to achieve my goals; hunting for new opportunities that can help a woman to start a career in science; an open and collaborative attitude; and most importantly the ability to go beyond my comfort zone. Without the support of my PhD supervisors, Associate Professor Bhagooli, Associate Professor Neergheen-Bhujun and Professor Bahorun, I would have never gone anywhere. Certainly, I would never have won highly competitive accolades and fellowships such as the L'Oréal-UNESCO for Women in science Fellowship for



Above: Preparing extracts derived from Mauritian marine sponges for anti-cancer testing. **Right:** Advocating for more women scientists in marine science at the L'Oréal-UNESCO Fellowship 2018 Ceremony.

sub-Saharan Africa, the Alexander von Humboldt Research Fellowship, the Global Young Academy North-South interdisciplinary grant, and the UNESCO Merck best Mauritian woman scientist for my work in the area of marine biochemistry and cancer research. These fellowships not only allowed me to work on different projects around the world, notably at the University of Edinburgh in Scotland, Keele University in England, University of Pretoria and University of KwaZulu Natal in South Africa, but also expand my research capabilities and network with amazing scientists. In particular, **I consider myself very lucky to have had the opportunity to work alongside Dr Veale Clinton, one of the finest marine natural product chemists we have in the southern hemisphere and learn as much as I can from his research experience.** Nonetheless, the best part of my research adventure has been working in collaboration with a team of experts, including Dr Hans-

Ulrich Steeger and Dr Bettina Zeis from the Marine Biological Tideland Station at Caroliniensel, Germany, on the exploration, ecology and physiology of the sand worm *Arenicola marina* of the Nordsee as part of my postdoctoral research at the University of Münster in Germany. **The hemoglobin of *Arenicola marina* is a highly efficient oxygen carrier, a property that has lent itself to exploitation by the biomedical industry in France, particularly against Covid-19.** I will soon step onto another postdoctoral research voyage at the French Institute of Research for the Exploitation of the Sea (IFREMER) in France where I will work on the biochemistry of harmful algal blooms and their toxic effects against some benthic invertebrates. Overall, I strongly believe that these research experiences will boost my confidence level as a promising and independent marine scientist. To this end, with the skills obtained, I will be in stronger position to realise my long term career





Exploring the ecology and physiology of the sand worm *Arenicola marina* of the North Sea.

goals – to expand existing infrastructure in Mauritius in a bid to promote the field of marine natural product research, particularly in the western Indian Ocean region.

As a woman researcher, I have had my fair share of challenges and I am still currently finding ways to navigate the rough seas.

Nine years into my research and academic career, one of the most common questions I hear from family and friends are, “Will she ever finish studying? When will she get married? When will she have kids?” Societal expectations, such as raising a family over pursuing a career, dissuades many girls like me from seeking a future in science. On the other hand, many women stop research and leave science after completing an excellent PhD project, which is not only a waste of personal accomplishment for the women themselves, but also a waste of talent for the scientific community and for the society as a whole. I firmly believe that, special mentoring programs should be designed for these women especially after completing their PhD or postdoctoral research. It is at this time that the most support and

awareness is needed. In addition to family obligations, I also had to deal with unhealthy competition from local senior scientists working in a similar research area. Often, receiving nasty comments on my research made me doubt my research capabilities. But looking back now, these experiences made me wiser and more confident. At the same time, a lack of career support, such as mentors, networks, professional development opportunities and especially female role models in the field of marine science, added to the challenges.

There is no doubt that access to education, sharing of information

including personal and professional experiences are extremely important in promoting gender equality in marine science.

For this reason, I particularly appreciate WIOMSA's network of Women in Marine Science initiative, which allows women to share their experiences with young women looking to start a career in marine science

So to my dear next generation of women marine scientists, my all-time mantra for success and a prosperous career is:

“ Never compromise yourself and don't fear to navigate never-before sailed waters, be patient, and don't give up! The path from dreams to success does exist. You should only have the courage to get on it and the perseverance to follow it”.

A diversity of experiences and challenges

BY BERNADINE EVERETT



“ I am a fisheries scientist from Durban, South Africa. I work for the Oceanographic Research Institute (ORI) which is a division of the South African Association for Marine Biological Research, a non-profit and non-governmental organization that has been in existence for 68 years.

I started off my working life as a reconnaissance photographer but along the way I decided that the natural environment was my passion and a career change was needed. I never dreamt that I would end up working in the marine environment because jobs were and still are scarce, but when the time came to find work after completing my undergraduate studies, it was the ORI that hired me. I worked my way up to the scientist position through continuing my studies in geography and marine biology.

I have been very fortunate to have worked on a wide variety of projects over the course of my career and these have led to some interesting and sometimes challenging times. The focus of my Master's degree was the recreational fisheries of the Richards Bay harbour on the east coast of South Africa. It involved trudging around the harbour once a month for four days, interviewing anglers as part of a creel survey. A small percentage of the angler outings were more about drinking than fishing, so I was subjected to some interesting conversations at times. Two particularly memorable ones were a proposal for marriage (because why else would I be talking to these people than to find a husband?) and being threatened with a punch in the face because I was, according to the angler, personally trying to stop him from fishing. Fortunately, on both occasions, interventions were made by the anglers' more sober friends and I escaped without a ring on my finger or a bruised face.

During this period, I had started working on a project called WIOFish, little knowing that this would become a major component of my work. WIOFish is an online database that collates fisheries information for the western Indian Ocean into a publicly accessible portal (www.wiofish.org). Initially I was a data

gatherer for this fisheries inventory but gradually took over the reins to become the regional coordinator for the project. It was WIOFish that gave me my first opportunity to travel beyond the borders of South Africa. **I have since travelled to all the countries involved in WIOFish as part of the process to keep all the data current and relevant.** This has led to some friendly jealousy from my co-workers and friends who think that when I am places such as Seychelles, Mauritius or Zanzibar, I am spending my time drinking cocktails under palm trees. It could not be further from the truth. I have benefitted immensely from these trips in that they have given me the opportunity to interact with some incredible scientists in our region. **I have been exposed to different cultures and experienced such kindness and generosity from the people I have worked with and met along the way.**

There is, of course, a downside to being a solo female traveller and that is personal safety. For the most part I have managed to stay safe but constantly staying vigilant can be exhausting on long trips. In the 14 years of travelling for WIOFish I have had only three incidents where I felt physically threatened. The first one was when, to cut project costs, I stayed in a very low budget hotel. Someone spent most of the night I stayed there, trying to get into my room. There was no security at the hotel, so I moved some heavy furniture against the door. Needless to say, I didn't stay there again and revisited what I was prepared to put up with to save a few dollars. The second incident happened one morning before work started. The WIOFish trips are a few weeks long and sitting in meetings all day makes me feel really unhealthy, so I used to go for a quick jog before the workday began to freshen up mind and body. One morning, however, I was attacked by a very respectable looking man, pushed up against a wall and groped. I bet this



Left: Sorting fish on Nansen.jpg: Bernadine with Latoya Shivute and Justine Kakuuai sorting fish on the research vessel *Dr Fridtjof Nansen* off Angola in 2017. **Above:** Bernadine assisting with the release of loggerhead turtles that had been rehabilitated at uShaka Sea World in Durban, South Africa.

Below: Working with Esther Fondo, Nina Wambiji and Gladys Okemwa of KMFRI to update the WIOFish Database (2008).

Bottom: Giving Tanzanian WIOFish colleagues a tour of the WIOFish database (2006).

never happened to any of my male colleagues! The third incident occurred when I was heading out to organize some logistical arrangements for a workshop and I was mugged. I had my passport and project money taken off me and was stabbed and battered during

the incident. Fortunately, I work with some amazing people, both at my home institute and the institute where I was working, who came to my aid and helped me to replace my passport and who sent me funds to continue the work and fly home.

My familiarity with fisheries data led to my involvement with other organizations that collect survey data with a fisheries focus all around Africa. **I missed out on participating in some research surveys in the Western Indian Ocean but an opportunity arose to volunteer for a survey off the west coast of South Africa. I grabbed this opportunity with both hands! I did this for quite a number of years and this has now led to my being hired to manage the fish laboratory on board a vessel for a survey every year.** Once again this has led to an incredible opportunity to work with people from different countries. Since I work on crustacean trawl fisheries in my home country, this is also the only opportunity I have to see and understand how trawl operations work; as a woman I am not allowed to go to sea on the industrial trawlers that operate off KwaZulu-Natal. Working in the fish laboratory is quite intense and while most of the men I have worked with do not mind taking instructions from a female, there are a few who still seem to cling to the idea that only men can be bosses. It takes a little bit of persuasion but most of the time this is a situation that can be overcome long before the end of a survey.

There are many challenges that face females working in the marine science field. Since I do not have children I am spared from a lot of the stresses that female scientists have to put up with but I am still subjected to male prejudice and personal safety concerns. My advice to young female scientists embarking on their careers is to:



“ Develop spade loads of common sense, believe in themselves, draw encouragement from those around them who have their best interests at heart, and to grab every opportunity that comes their way.



WIOMSA

Coasts Ocean and People

INNOVATION FOR SUSTAINABILITY GRANT CALLS FOR SUBMISSION OF CONCEPT NOTES

THE DEADLINE
FOR SUBMISSION
OF PROPOSALS
IS 26 JUNE 2020.

Applications should be completed and support documents uploaded at <https://proposals.wiomsa.org/innovation-for-sustainability-grant-proposals/>

WIOMSA is pleased to announce an inaugural call to support innovative actions (demonstration and pilot projects), through the Innovation for Sustainability Grant programme. To address modern-day marine sustainability challenges, the grant programme supported by both the Marine and Coastal Science for Management (MASMA) programme and the Cities and Coasts (C&C) project, is established to bridge the gap between marine research and innovation. **In this call, WIOMSA aims to provide competitive grants that drive innovation for a sustainable marine environment.**

The goal of the Innovation for Sustainability Grant programme is to support the development and testing of transformative, paradigm-shifting concepts, and approaches that address and enhance our understanding of marine and coastal environmental issues.



For detailed instructions on these grants, visit the WIOMSA Website www.wiomsa.org

The highs & lows of a **career** in **marine science**

BY JULIET FURAHA KARISA

“ I work with the Kenya Marine and Fisheries Research Institute (KMFRI) in Mombasa as a marine ecologist with a focus on coral reef ecosystems.

I'm currently pursuing my PhD in biodiversity at the National Taiwan Normal University and the topic of my thesis is to provide information about the resilience of coral reefs – their ability to cope and recover from disturbances – in an effort to forecast their future prospects. This information can help guide management intervention to secure the survival of coral reefs in the face of many disturbances, such as climate change. I grew up in the coastal region of Kenya, during a period when there were strong taboos that prevented girls from visiting the beach or swimming in the ocean. The only thing I knew existed beneath the ocean was fish, sharks and seafood because this formed part of our diet.



As I was growing up, I wanted to become a banker because that was the career most of my elder siblings were pursuing. When I received my letter of admission for an undergraduate degree in fisheries and aquatic science, I wondered what career I would have; this was the first time I became aware of the existence of this kind of course. I vowed I would earn the “it doesn’t mean much” degree and then get into the banking industry.

The “aha” moment that re-shaped my career aspirations towards marine ecology happened when I went for my undergraduate attachment at CORDIO East Africa (Coastal Oceans Research and Development Indian Ocean) in 2004. I was

That’s when it dawned on me that this magnificent underwater system is not only a source of food that I had known growing up, but also supports a myriad of life on land and sea and needs to be protected in order to continue offering those services.

Certainly, the subsequent fieldwork tasks were very challenging! I remember at some point declaring never to go to sea again after a tough diving experience that included horrible sea sickness. This experience almost made me turn my back on my new-found dream career, but the feeling of giving up only lasted as long as it took for the boat to dock on the beach! **The adrenaline rush called**

“ My purpose to become a marine ecologist got clearer, I wanted to work in an environment where I could contribute towards the protection and sustainable use of marine natural resources. This was so new to me, but I was ready for the challenge!

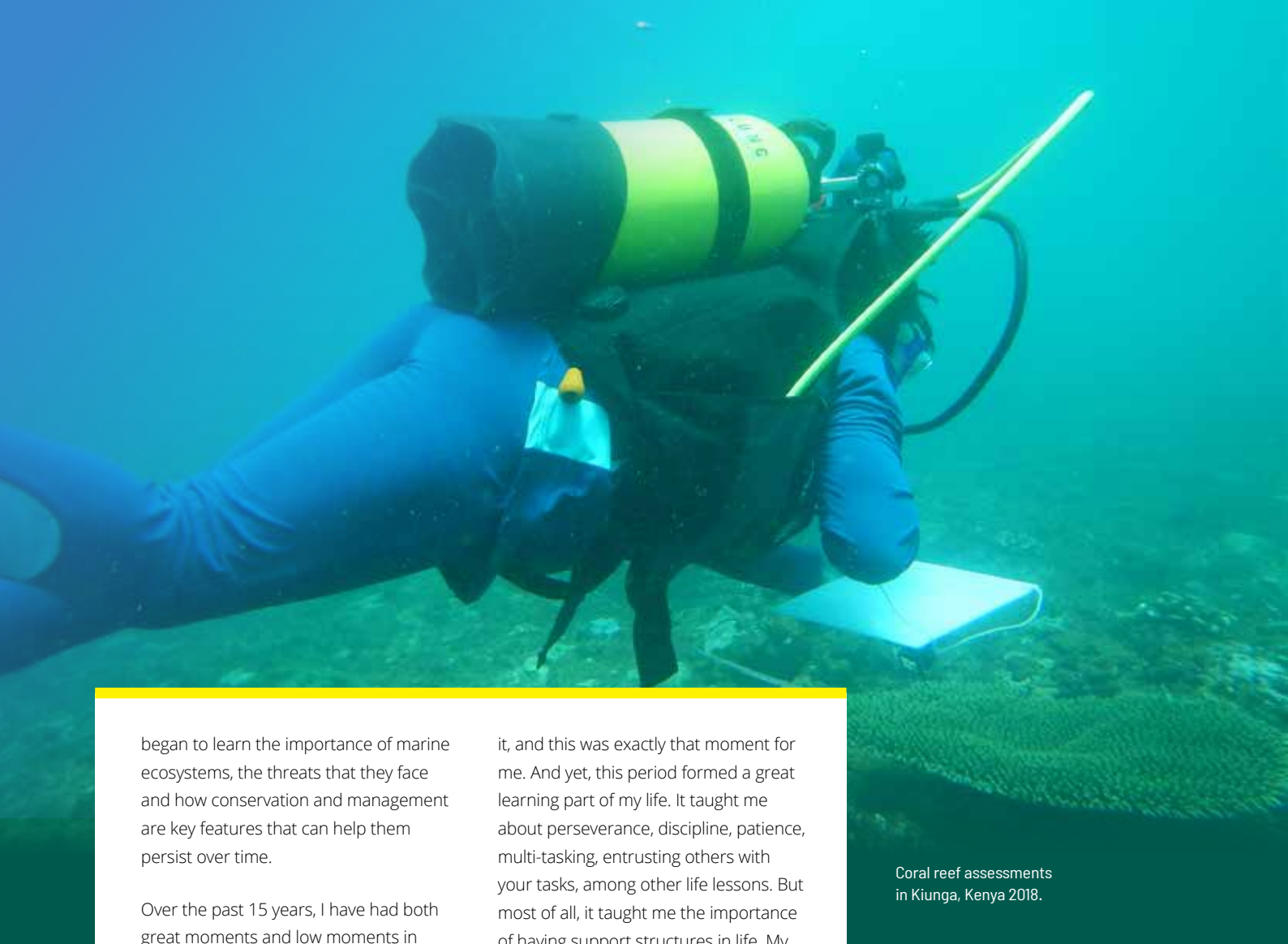


introduced to coral reef research under the great mentorship of Dr David Obura, a renowned coral reef expert, and Dr Sangeeta Mangubhai who was then a PhD student. I was trained in snorkelling skills and underwater surveys, and finally diving.

My first experience of snorkelling was at the coral garden in Mombasa Marine Park – the coral reef was so breathtaking, the beauty and serenity of the underwater life was just mesmerising.

me back to the sea and I realized the love and connection I had developed for the underwater world, and the physically challenging aspects of the job, would always drive me to continue in this career. Also, watching Dr Mangubhai go for her diving field surveys for her thesis, sometimes doing night dives and coming back with many samples, and how she would spend hours and hours in the lab, started to build a curiosity about research. With guidance from mentors, colleagues and my endless immersion in literature, I

Left: Gender imbalance in divers in marine research, Kiunga, Kenya 2008. **Right:** My very first time going on a snorkelling survey during my attachment, at Mombasa Marine Park in 2004.



Coral reef assessments in Kiunga, Kenya 2018.

began to learn the importance of marine ecosystems, the threats that they face and how conservation and management are key features that can help them persist over time.

Over the past 15 years, I have had both great moments and low moments in my career. My career trajectory began as a fresh graduate with an invitation to be an exchange student at Linköping University in Sweden, and thereafter a Master's scholarship that was funded by a world-bank project at CORDIO-East Africa. As a graduate student and junior researcher, there were so many opportunities for networking and learning from marine experts from the region and the world through conferences, workshops and trainings. However, as my **career progressed, so did my family life. Having to raise children meant having to cut down on fieldwork and travel during the pregnancies and after birth, or sometimes travelling with a baby into the field.** We are talking of about two years of career re-adjustment per child. I also began my PhD at this time and that meant having to defer my studies at some point in order to balance the demands of family, work and study. As the common adage goes, you can't have your cake and eat

it, and this was exactly that moment for me. And yet, this period formed a great learning part of my life. It taught me about perseverance, discipline, patience, multi-tasking, entrusting others with your tasks, among other life lessons. But most of all, it taught me the importance of having support structures in life. My PhD supervisors, peers and family have always encouraged me and rallied me along, helping me to believe in myself. It has made me realise that in our careers we need strong support structures; a network of people with whom you can celebrate the successes, but who also lift each other up and give encouragement during the tough times.

We need more men and women who are in advantaged positions to mentor, employ and generally provide and lobby for more opportunities for women towards their empowerment.

My PhD study is the major initiative I am working on currently. Before I embarked on my PhD, I had been doing mainly fieldwork-based monitoring surveys and analysis to write technical reports for stakeholders at local and national levels. Now as a student, I have learnt that to be a remarkable researcher with an impact

“ As a woman, I have found a lot of support not only from other women but also from men. There are so many men who go out of their way to support women in marine science and I feel that the role of men in empowering women in marine science should also be emphasised as we mainstream the role of gender in this field.

“ Being a woman marine scientist is not a walk in the park. The demands of the work are huge and sometimes spill over the normal working schedule because you have to conform to sea conditions or align with grant deadlines and paper submissions.



Above: Working mum. Going to the field with baby, 240km from home.
Right: Re-connecting with my very first woman mentor, Dr Sangeeta Mangubhai, at a conference in Fort Lauderdale, Florida.

on the society, we need to come up with solutions to solve environmental and societal problems. This has revolutionized the way I had always thought about research and has made me change the way I design my career strategies.

I would advise young women who would like to pursue careers in marine science and related fields that it's good to take time to experience the different fields. Treat your attachment, internship, volunteer sessions with seriousness because these could be the starting point for setting up your career. In some fields of marine science, you have to allow yourself to “get dirty” to learn. As women, spending countless hours in the sun while doing fieldwork on coral reefs, or having to walk through muddy environments in mangroves can take a toll on our “beauty”, from face sunburns to fingernail cracking. This can be a big problem, but I wish to tell aspirant marine scientists that you can keep your beauty even as you spend countless hours in harsh environments, just by taking basic skin care measures. So, do not fear getting “dirty”, the experience can actually be incredible!

Another word of advice is to find a mentor as early as possible. As you begin your career you will need someone who will guide and encourage you. At the beginning, we are so clueless about what the field offers and having people to show you around can be rewarding. And, as you move along with your career, try to create good networks. I remember as a master's student I attended a marine workshop in Mombasa organised by Dr Allen Chen (Academia Sinica, Taiwan). Six years later he became my PhD supervisor! That is the power of networking.

Many a time you will have to stretch outside the normal schedule to get things done. On top of this, as women we play a huge role in our families, with responsibilities ranging from being a daughter, a sister, a wife, a mother, an aunt, a friend, etc., and there is need to work smart in order to fulfil our role as women in society, as well as to advance our careers. Striking this balance can be tough but it is manageable, especially when we learn from those who are ahead of us and who serve as our role models.





Analysis of fresh water quality starting upstream to the coastal zone, Manica Province, Mozambique.

BY **STELA FERNANDO**

Being connected brings opportunities



“ I have a Master’s degree in aquatic biology and coastal ecosystems and a background in ecology and natural resource management from the Eduardo Mondlane University in Mozambique.

After concluding my undergraduate studies in 2007, I was employed at the University as a temporary research assistant, working on two projects: the Transboundary Networks of Marine Protected Areas for Conservation and Sustainable Development: biophysical, socio-economic and governance assessment in East Africa (TRANSMAP); and Peri-urban Mangrove Forests as Filters and Potential Phytoremediators of Domestic Sewage in East Africa (PUMPSEA).

Currently I am a researcher at the National Institute of Fisheries Research, working in the Department of Fisheries Assessment. My main task is to monitor and assess intertidal marine invertebrates, including their socio-economic importance. I also provide technical assistance in the implementation of projects and supporting communities. Recently my research interest expanded to include sharks, a barely known resource in my country. My work includes monitoring fisheries, biology and ecology of the species, and taxonomy. **I also work with the management of sharks and I have recently contributed significantly to the National Plan of Action for Sharks.** As the Mozambican focal point for marine species for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), I also provide advice on the inclusion of marine species (sharks, rays, sea cucumbers and molluscs) on the CITES appendices.

It was at university that I first gained an understanding of the tools required to study marine biology and my thesis entitled ‘Litter fall and decomposition of mangrove species, *Avicennia marina* and *Rhizophora mucronata* in Maputo Bay’ gave me an opportunity to make contact with WIOMSA; I presented a poster at the Fifth WIOMSA Symposium in 2007. This study culminated in the publication of my first article in the Western Indian Ocean Journal of Marine Science (WIOJMS, Volume 8), a great experience that resulted in my becoming a member of WIOMSA. I have attended most of the WIOMSA symposia since then.

The first major challenge I ever faced as a marine scientist was the writing of a WIOMSA Marine Research Grant Programme (MARG I) proposal addressing issues of seagrass degradation due to dugong grazing. Luckily, my proposal was accepted and I managed my first small research project. This MARG I project was the first of several other research

grants and projects that I have obtained from WIOMSA and other donors. One such project was a Marine and Coastal Science for Management programme (MASMA) project which looked at the biology and ecology of edible sea urchins across the Western Indian Ocean region (Mozambique, Tanzania and Kenya). Through the implementation of this project, I gained a lot of experience working with multidisciplinary teams, the members of which came from very different backgrounds. This project also contributed to my MSc thesis work. Remarkably, my involvement in these MARG I and MASMA projects also resulted in me contributing to the book ‘The Maputo Bay Ecosystem’, published by WIOMSA.

Later I worked with other major projects (e.g. the Artisanal Fisheries Promotion project, ProPesca, the South Western Indian Ocean Fisheries project, SWIOFISH, and others) which provided me with opportunities to interact with different stakeholders, from colleagues

in the fishing sector, to the private sector and international funders such as the World Bank. These experiences were enriching and challenging because I also kept up my research and conducted administrative work.

Being a woman is a major challenge in the research arena in Africa, and in particular Mozambique.

“Opportunities often have to be conquered in order for a woman to be proven worthy, but the most valuable lesson I have learnt is the importance of being connected to other people.”

This brings opportunities to grow professionally and is true for both young and senior scientists; there is always something new to be learnt.



Collecting shark images using Bated Remote Underwater Videos for a joint IIP and WCS project in Inhambane Province, Mozambique.

A woman in the prawn fishery

Below:
Penaus
monodo



Catherine Mwakosya, fondly referred to as “Mama Prawns or Mama wa Kamba miti” in Swahili because of her love of all things prawns, is a renowned prawn fisheries expert in Tanzania. She is a fisheries researcher at the Tanzania Fisheries Research Institute (TAFIRI).

BY CATHERINE MWAKOSYA

Her background is in fish stock assessment and management – she studied at the University of Bergen, Norway – and she holds a PhD in marine sciences from the University of Dar es Salaam.

The prawn fishery is an important marine fishery in Tanzania in terms of income generation and export value. The country's prawn resources are mainly concentrated within the shallow continental shelf and are exploited by both industrial and artisanal fishers. Resource user conflicts in the prawn fishery have been documented because the two fishery groups compete for the same resources, in the same environment. There was a need for an assessment of prawn stock in order to establish the status of the fishery.

Catherine's journey into the field of prawn research began in 2000 when she was engaged on a prawn stock assessment survey along the Tanzanian coast with other scientists from TAFIRI.



The study revealed a declining trend in the resource and the government was advised to reduce fishing effort or consider quota allocations for a specified number of boats per fishing season. In 2009 she became TAFIRI's focal point for the implementation of the Marine and Coastal Environmental Management Programme (MACEMP). The main task of the MACEMP project was to assess the effectiveness of prawn fishery closure and to assess other nearshore fishery stocks. **During the project there were several research cruises and Catherine was part of the team of scientists on board.** The study observed a slow recovery of the stock, despite the existence of a moratorium on industrial fishing. The recommendation given to the government was to maintain the moratorium and assess the impact of the artisanal fishery on the exploitation of prawn resources.



Shallow water prawn hauling: Sorting of catch. @ Nina Wambiji



Prawn catch being hauled on to the trawler on a sorting tray, in Ungwana Bay, Malindi Kenya. @ Nina Wambiji

“ Catherine believes there are a lot of opportunities within the prawn fishery and encourages young scientists to explore the field of research.

Right: Fenneropenaeus indicus. @ Nina Wambiji
Below: Collection of samples during the SWIOFish artisanal fishery survey.



Catherine participated in the regional South West Indian Ocean Fisheries Project (SWIOFP) between 2008 and 2011, as national component coordinator for crustaceans. Over the course of SWIOFP

she worked on a genetics connectivity study of prawns in Tanzanian coastal waters. This formed part of her PhD research. The study indicated the existence of a single stock within Tanzanian coastal waters, but there is also an indication of a bottleneck impact caused by decreased diversity within the country's prawn resource

Currently, Catherine is engaged in the ongoing South West Indian Ocean Fisheries Governance and Shared Growth Program (SWIOFish) which is being implemented between 2015 and 2021. She is principal investigator for prawn research, with the task of assessing the status of artisanal prawn resources in the coastal waters of Tanzania, and is a member of the research team responsible for assessing the status of the artisanal small pelagic fishery. She also participated in the ecosystem survey and demersal fish stock assessment in the Western Indian Ocean onboard the research vessel *Dr Fridtjof Nansen* which took place in April 2018.

“ Working on board a prawn trawler can be challenging because the vessels used in the fishery are small and generally uncomfortable. The design of the vessels does not accommodate female crew members and there can be periods of very rough weather at sea. However, all these constraints have not dampened Catherine's enthusiasm for conducting research on prawns.

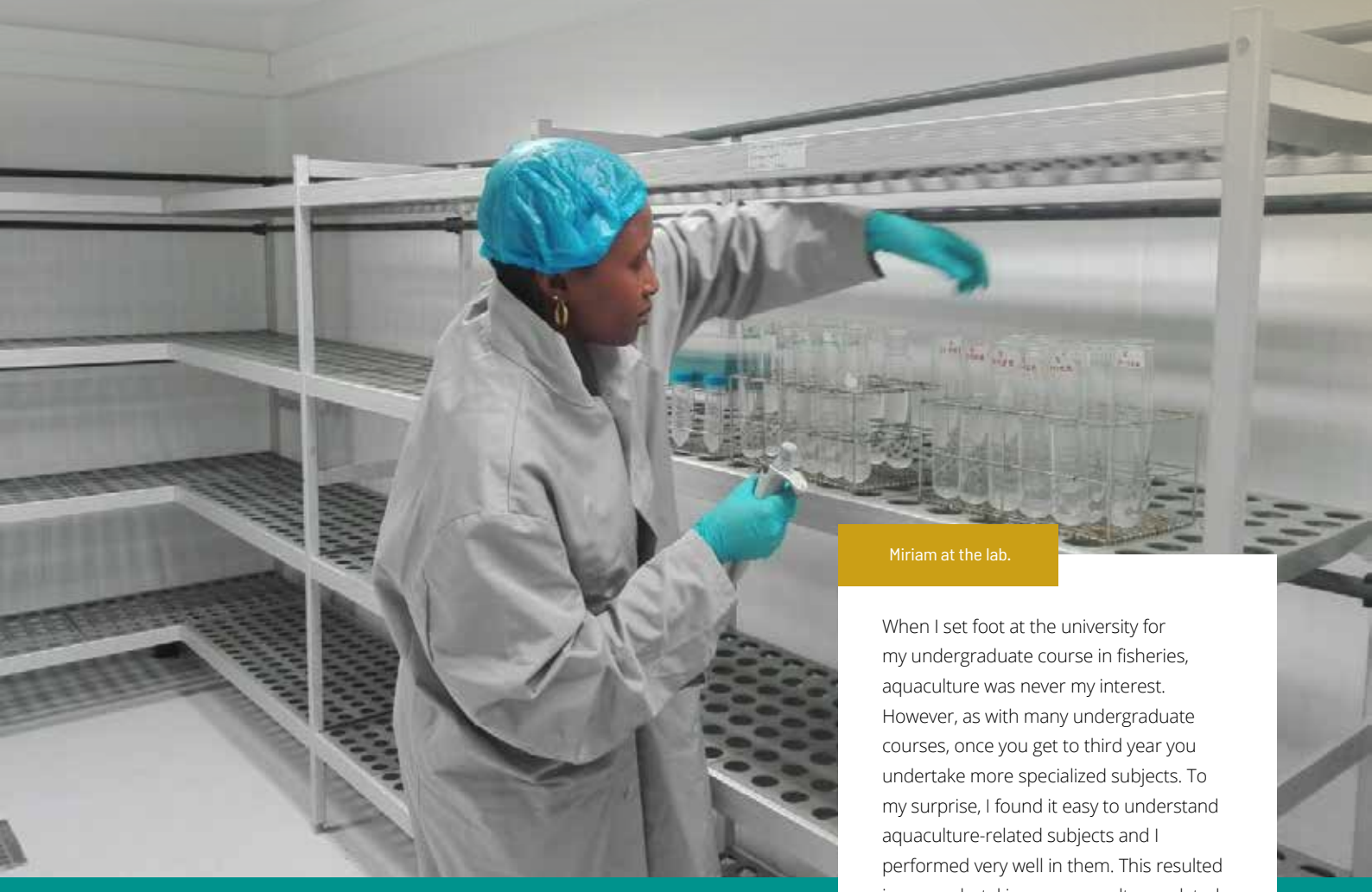
Below: An assortment of prawn catch from the haul with bycatch such as the shark and discards. @ Nina Wambiji



“ There are a lot of opportunities within the prawn fishery. I encourage young scientists to explore the field of research. Most of the production of the fishery depends on wild populations, and so the promotion of prawn culture could help to address the declining resource. Studies on the life cycles and ecology of prawns are other areas of opportunity and there is still debate between fishers about the closed season, specifically the ideal time to close the artisanal fishery and the industrial fishery.”

Aquaculture | BY MIRIAM WAINAINA

development can empower women



Miriam at the lab.

“ I am an aquaculture researcher working in the Mariculture Department of the Kenya Marine and Fisheries Research Institute (KMFRI) in Mombasa. My interests are in fish breeding techniques, larval rearing and fish health management.

When I set foot at the university for my undergraduate course in fisheries, aquaculture was never my interest. However, as with many undergraduate courses, once you get to third year you undertake more specialized subjects. To my surprise, I found it easy to understand aquaculture-related subjects and I performed very well in them. This resulted in me undertaking an aquaculture-related project during the final year of my degree. Being a newly recruited researcher at KMFRI I knew I needed to equip myself with technical skills in my new position. **I chose to pursue aquaculture during my Master's studies at the University of Ghent, Belgium.** Pursuing this field became even more necessary because in Kenya, the aquaculture sector is still in the development phase and we know research is a key driver for its development.



Above: Undertaking a breeding protocol for Pompano at SEAFDEC/AQD. **Below:** Undertaking a capacity building session on aquaculture with the community on aquaculture.

Aquaculture research is a very practical field and a whole range of different studies can be performed by manipulating environmental conditions so that they mimic the natural world. I am always happy to draw the attention and interest of undergraduate students to aquaculture laboratory-based research because there are countless studies one can do while gaining an opportunity to develop exciting technology. **Besides all the laboratory work, I have had many opportunities to engage with community groups, mostly women and youth, engaged in marine fish farming along the Kenyan coast.** I enjoy being in the field, listening and observing as I learn more. Often, I give support to my research team during capacity building sessions where a lot is shared from fish farming to conservation approaches to aquaculture.

As a woman in aquaculture research, one of the biggest challenges has been to create a balance between my family and the advancement of my research, because of breaks occasioned by family life. I believe mentorship, especially from a fellow woman, plays and will continue to play, a big role in moulding many women in science during such periods, enabling them to stay focused.

Some of my achievements include participating in strengthening the role of women in community-based marine resource management and aquaculture. My biggest satisfaction has always been to be able to provide practical solutions to their challenges, and to see women empowered, contributing towards food security and securing an alternative livelihood from the blue economy.



My advice to young women planning to pursue a career in marine science would be for them to ask themselves:

“...is this something you are passionate about? Is it something you believe you can do? If you answer these questions with a “yes”, then dedicate your time and go for it!

Seize opportunities and advance your education or pursue a short course and learn new research techniques. Surround yourself with a mentor. This will be beneficial not only for your career, but also your personal growth.

Working in **marine conservation** in Madagascar

BY **ANJARA SALOMA**



“ I am a researcher and also the executive director of Cétamada, a malagasy non-profit organization which strives to protect marine mammals and marine habitats in Madagascar.

The antenna connected with high frequency signals is used to track the acousonde tag, after it has been released on humpback whale calf.

I completed my schooling in Antananarivo, the capital city of Madagascar, and I attended the University of Antananarivo where I studied animal biology, ecology and conservation. This choice led me to work in the field of marine mammal conservation, something I have been doing since 2011. I started my adventure with cetaceans as a volunteer, an amazing experience. Since completing my Master's degree in 2013, I have been working as a scientific coordinator with Cétamada.



“ I am currently leading a major project on marine litter in Madagascar. Marine litter is a huge problem for our planet and it is fundamental for Madagascar to deal with every day trash. The project is led by five women and is located in four main areas of Madagascar.



Above: Anjara going through photo identification procedures prior deploying an acousonde tag on a humpback whale calf.

Top right: Humpback whale. © Cetamada.

Bottom right: Deploying the acousonde tag on the humpback whale calf.

This has allowed me to meet a wide range of researchers and to enroll in a PhD programme (in 2015). **My research is focused on the mother-calf interactions of humpback whales and I have studied acoustic communication and other types of communication modalities between female humpback whales and their newborns, such as visual and tactile behaviours.** In addition to my research, I am involved in many projects in the southern Indian Ocean region, with many different themes related to marine conservation.

Like many students from Antananarivo, which is situated in the highlands, I was initially not used to working at sea and even less on a boat. However, I had very comprehensive training at the University of Antananarivo which allowed me to adapt easily to working in the marine environment. **During the first five years of my career, I spent up to eight hours a day at sea for a period of about four months each year. It was a very big challenge, but with a lot of passion, I was able to achieve it quite easily.**

The conservation programme set up by Cétamada aims to promote responsible whale ecotourism, scientific research, environmental education and community development. The activities therefore involve a wide range of fields and people, which makes the work even more challenging. **Since I started working with Cetamada, I have learnt the importance of including local communities in all conservation projects.** In 2015, I was involved in the creation of the Anjaranay Community Training and Health Centre (www.anjaranay.org) which offers training on income-generating activities to the local community in order to improve their living conditions and thus reduce the pressure on marine habitats. This project is dedicated to women, men and young people and it is really encouraging to see the potential of each person, and their desire to learn and be

entrepreneurial, and most importantly to see young people interested in and engaging with different types of trades such as crafts, agriculture, aquaculture and beekeeping.

Cetaceans have led me to work on several themes such as algae, coral reefs and mangroves. Marine conservation is really important, especially on islands such as Madagascar which has more than 5 000 km of coastline.

I encourage all women interested in working on marine conservation to follow their ambition – there is a lot we don't know, many mysteries to be solved and many communities that needed to be led in the right direction. The ocean ensures life on our planet and everyone must take responsibility for its protection. Why not you?



Make a difference, no matter how small

BY CHARLOTTE AUMANN

“ I am from Mombasa, Kenya, and am currently a third-year student at the Technical University of Mombasa pursuing a career in marine resource management.



When I was in high school, I was determined to follow a career related to business, such as finance and economics, but later I developed an interest in geography and especially marine science. **I received quite some criticism for choosing a career in marine science instead of a job that results in fast money, but that did not deter me because I wanted to do something that gives me a lot of freedom, while also knowing that I am playing a part in protecting the marine environment.**

Through my studies I have been able to learn a lot about marine science and management and to clearly understand the biggest global challenge of climate change. This has encouraged me to keep going so that I can create awareness and make a difference, no matter how

small. Fortunately, I was able to secure an internship with an institution that supports marine and fisheries research in the small village of Gazi, which is characterised by a high degree of poverty and illiteracy. This helped me to understand community views on the management of marine resources. During my attachment to the research station in Gazi, **I faced some challenges,**

volunteering to educate the local community and creating awareness through youth groups such as Stand Up and Shout Out and my university environmental club. I also participated in making policies with the local community on managing the coastal forests in Vanga which are currently under threat, mainly due to over harvesting for timber and firewood.



Left: Planting of *Cerip tagal* mangrove seedlings with the Chief Conservator of forests in Kenya, during the launching of blue carbon project to the Vanga community that will benefit from carbon trading.

Above: Planting of *Rhizophora mucronata* seedlings in degraded high energy zones at the shores of Gazi bay, Kenya using the new improvised method of restoration using PVC pipes. **Right:** Took part in an ecotourism workshop with the Gazi women group who venture in tourism as part of their income from the mangrove boardwalk in Gazi bay, Kenya.

such as not being heard during project planning, not being given a leading role during certain activities because men were mostly chosen to be leaders, and being left out of some of the field work because it is assumed that women are not able to handle some types of work.

I would also sometimes be criticized by the villagers during seminars and field work because it is a cultural belief that men's opinions and ideas are more considered than those of women.

Through my experiences and observation of current marine environmental challenges, I wanted to become involved in finding solutions. As a result, I have taken part in many activities such as beach clean-ups, planting mangroves and participating in training and workshops such as conservation of marine resources, ecotourism and litter management seminars. I am currently

“ I would encourage women to choose marine science courses and to develop a career in marine science because it is not gender biased, but rather it promotes equality.

They should also love their work when pursuing this career and have a positive mindset by enjoying what they are doing. Marine science is a complex field that does not limit one to studying or working, thus they should not be picky but ready to find new opportunities and volunteer which it all depends on one's passion and determination.

**SOCIAL SCIENCE
FOR THE WESTERN
INDIAN OCEAN:**



Addressing the “fishy” elephants in the room

| BY MIALY ANDRIAMAHEFAZAFY

“ I am a social scientist from Madagascar. I graduated with a Bachelor’s degree in public law from the University of Antananarivo, Madagascar and a Master’s degree in conservation leadership from the University of Cambridge. I am currently finishing my PhD in human geography at the University of Lausanne, Switzerland. I also worked in Madagascar as a policy officer for the marine conservation organization Blue Ventures for four years.

issues that requires policy input. It is also through Blue Ventures that I came to be interested in the bigger problems. Going to the field, fishers would complain about big boats they see and the diminishing resources. Most of those big boats would be shrimp or tuna vessels so I wanted to investigate how such boats came to be in our waters, especially tuna vessels from foreign countries. This led me to my PhD journey.

Mialy Andriamahefazafy interviewing a tuna fisher in Mauritius.

I was very fortunate to work with Blue Ventures early in my career. The organization’s staff members are truly dedicated to marine conservation and improving local livelihoods. Through Blue Ventures, I have had opportunities to represent my country at international meetings and my experience was key to my acceptance to Cambridge for my Master’s degree. I am forever grateful for everything I gained there and remain happy to help on any



My current research looks at the management of tuna fisheries in Madagascar, Mauritius and Seychelles from a social science perspective. Using political ecology, a branch of geography focusing on the socio-economic and political drivers behind environmental change, I am analysing the role of politics in the tuna fisheries. Tuna resources are the blue gold of the Western Indian Ocean (WIO) region, yet very limited research has been done to understand why there has been limited success in the management of tuna fisheries and why one of the key species – yellowfin tuna – is currently overfished. My study shares the local stories of tuna fishers in the WIO and their struggle with the depletion of resources. It also highlights the challenges African coastal states face when they provide access to tuna grounds to foreign countries like Japan or the European Union. With overfishing, it is often easy to blame the state for allowing such a situation to develop. However, a deeper study of the socio-politics shows that states of the WIO are not just bad managers of the resources, they have limitations and in the case of tuna resources they are under enormous pressure geopolitically and economically from fishing nations, often also from major aid donors and suppliers of canneries in-country. Those links can be easily overlooked and bring solutions that do not address what I call the “fishy elephants in the room”:

geopolitics and capitalist interests. Additional similar studies from social scientists are key to understanding such processes and addressing the problem at their political and economic roots.

The path to doing social research, especially as a female researcher from a poor country like Madagascar is not without its challenges. In my fieldwork in the neighbouring islands, some of my interviewees have never encountered a Malagasy woman doing research and they would ask me if I worked for the cannery or for a factory. Those kinds of comments show the limited interactions that we have with people in the WIO beyond our academic or professional circles. This encouraged me even more to interact with coastal people because it not only helped my research, but also because our interactions provided another perspective of Malagasy women.

Women have a major role to play in managing marine resources. My approach of undertaking social science aims to contribute knowledge towards the management of fisheries in the WIO. It is complementing the great science and conservation work that female colleagues are doing in our region. Ultimately, issues of marine conservation and fisheries management require extensive work to address the lack of knowledge of the resources and about

the social and political drivers behind the several threats that our marine resources are facing – from overfishing to ecosystem degradation or the reduction of marine biodiversity.

There are more and more opportunities for women in marine science and conservation. I encourage young women to take them, including bursaries to study abroad or work opportunities within your own country. Experience at the local level is key to understanding the needs of coastal people of the WIO. There are also an increasing number of women in marine science and conservation in different countries of the WIO – please do not hesitate to get in touch for advice or collaboration, either in your own country or in other countries of the region. Finally, while it sounds very clichéd, you will need a good life–work balance to succeed in the marine sciences. **Working in marine science and conservation is fascinating and exciting but it is also a lot of work and not always the best paid position.** To me, it is important to have your social life going, whether that be with family or friends. Our enthusiasm is key for those around us and is one step towards making them aware of the issues we are dealing with in our oceans. In the end, we can learn a lot from being like the ocean: open, flowing and in harmony with nature.



Teaching and resolving conflict

IN COASTAL AND MARINE RESOURCES

BY SARAH ATER |



“ I am Sarah – a teacher, a mother, a mediator and a foodie active in coastal and marine resource management. I started off as an environmental educator at the Mombasa office of Wildlife Clubs of Kenya where my work involved outreach programmes to students through a mobile education unit.

“
As a mediator
and teacher, I
know that our
experiences, even
during the detours,
enrich our paths
because we return
to them with even
greater insight and
inspiration.”

Left (opposite):
Baysprings Pre-school
children on a guided sea
excursion with Sarah.

We would visit schools to give talks, show videos, assist with tree planting and waste management projects, as well as fielding questions on issues of interest to the students. We also facilitated the participation of member schools in activities like the Marine Environment Day and the International Coastal Clean-up.

I had my first encounter with turtle hatchlings at the Jumba Ruins where a local non-profit organisation, Baobab Trust, was conducting beach patrols and turtle nest protection.

As a member of the Kenya Sea Turtle Conservation Committee, I was involved in outreach and awareness with turtle conservation groups to promote protection of turtle nesting sites and discourage poaching. My involvement in marine education and awareness in both the schools and the community gave me an opportunity to travel to different parts of the coast and engage with the locals, being exposed to their way of life and understanding their interactions with marine and coastal resources. Those experiences also helped me significantly improve my spoken Kiswahili and develop a deep appreciation for coastal cuisine.

Later, while working with CORDIO (Coastal Oceans Research and Development Indian Ocean), I was exposed to rigorous research, proposal and report writing. Apart from being instrumental in packaging research findings for different target groups,

I enjoyed working with diverse groups such as women, youth and fishers to help improve their basic and financial literacy, thereby empowering them to be better custodians of their resources.

I regularly used different forms of art and field excursions to explore both marine education and environmental education with students and teachers. **Pursuing my postgraduate studies in International Development and Education helped solidify my practise in environmental education and awareness, propelling me into a more senior role as well as creating an opportunity for me to teach environmental education at the university.**

I took a break after the arrival of my second child, moving into “edupreneurship” and setting up a kindergarten. Given my background, environmental consciousness was a key component of the learning, and I provided plenty of art and outdoor engagement for the children in my custody.

More recently, I have been involved in mediation – a form of dispute resolution – where a mediator assists those in conflict to find a solution. Mediation is increasingly used in commercial and family disputes and hailed for its ability to restore relationships and provide lasting solutions because it empowers those in conflict to work out their own solutions. With declining resources, multiple needs and interests as well as rising populations and climate change challenges, mediation may provide a way to resolve environmental disputes. **Workplace mediation can be harnessed so that both junior and senior scientists can create a more productive work environment, while community mediation can address issues arising from the allocation and use of resources, as well as sharing of benefits from resources.**

I am actively raising awareness of how mediation can be used to improve management of coastal and marine resources. I provide training to conservation organisations, explaining what mediation is and exploring how it could be used to help their staff address issues that affect productivity, and to engage positively with community members to maximize sustainability of resources.

As an active participant in coastal and marine resource management, I recognize the support I have received from many women through information shared and guidance provided, as well as mentorship from men who are supportive of women. Sometimes, it may not be possible to have everything at the same time, for example, you may need to take a break when a loved one is chronically ill, or to attend to young children. However, you can certainly resume your career and proceed to have it all, one at a time. While our paths may not always be linear, you can always loop back like I did.

A mission to restore coastal forests

BY DORCAS WAKIO MUGO



“ I am a third-year student at the Technical University of Mombasa, Kwale Campus, pursuing a Bachelor’s degree in marine resource management. I am also a member of the campus environmental brigade club.

When I was in high school I was inspired by Elizabeth Marami, a 28-year old woman who became the first female marine pilot in Kenya. This showed me that women not only have a place in the maritime industry, but they can also excel, and this motivated me to apply for a degree in marine resource management.

Pursuing my studies in marine resource management has improved my understanding of what the marine field comprises. Not only does it consist of the ocean waters, but it also has a variety of resources that boost our socio-economic status. During my three-month attachment to WWF in Kwale, I participated in various marine conservation-related programmes like the recent International Coastal Clean Up at Shimoni Beach and clean-ups and reforestation of mangroves at Vanga. All these experiences increased my knowledge and diversified my understanding of the field.

Top: Participated in mass planting of different indigenous tree species at Gongoni forest under WWF-Kwale landscape. We planted over a thousand seedlings to the degraded areas of the forests. **Left:** Participated in the launching of World Mangrove day at Vanga where I took part in planting (Ceriop tagal) mangrove seedlings at the degraded regions.



Being in a male-dominated industry, I faced some challenges during my attachment.

For example, I was told that marine science is not meant for “girls”. Even though I was the only woman in a whole group of men, I stood up and defended myself, saying that I can do the work even better than men can.

After visiting some of our coastal forests I discovered they have really been destroyed

– a lot of burning of charcoal has taken place and human settlements have taken over the greater part of the forests. A mass tree planting event took place in our coastal forests in April and during our attachment, my colleagues and I started a tree nursery consisting of 28 different indigenous species and a total of 3 300 trees. Our goal is to restore our coastal forests to their former status.

“ My advice to young women in Kenya who want to pursue a career in marine science is that the maritime industry is ripe with opportunity.

However, according to the International Labour Organization, **women only account for two percent of the total workforce in the industry.** Hence, my plea to young women is to apply for marine studies and take up the opportunities the field has to offer.



Top: My fellow attaches together with our supervising lecturer at our attachment project where we established a nursery consisting of 3200 indigenous tree species.

Above: Planting the mangrove seedlings together with my fellow students present and Mr Elias Kimaru the former manager at WWF-Kwale Landscape.

WIOMSA

Coasts Ocean and



CALL FOR ARTICLES FOR A SPECIAL ISSUE ON COASTAL ECOSYSTEM RESTORATION

The WIOMSA Magazine is inviting articles on the theme “Restoring damaged WIO Coastal Ecosystems”. Restoration of coastal ecosystems is regarded as a viable nature-based solution in achieving a wide range of global development goals. It is for this reason that 2021–2030 has been proclaimed the United Nations Decade on Ecosystem Restoration, to support and scale up efforts to prevent, halt and reverse the degradation of ecosystems worldwide and raise awareness of the importance of successful ecosystem restoration.

Over the years, restoration of critical coastal habitats such as mangroves, seagrasses, coral reefs have been undertaken in the WIO region. While some of the restoration initiatives have remained at the experimental level, others have gone beyond that to be implemented at a large scale. In the process, a wealth of lessons from different restoration experiences on success and failure have been learnt and their dissemination will provide a great opportunity for shared learning across the region.

The 11th issue of the Magazine welcomes submissions, both analytical commentaries as well as experiences, that broadly relate to the theme. The stories could focus on successes, failures, challenges, lessons learnt and highlighting opportunities. They could also cover community participation and how restoration fits in the wider ecosystem management and livelihood options for communities, costs and economics of restoration activities and comparison of different restoration techniques. Submitted articles must be interesting, of inspirational value and raise awareness of what the initiative has experienced in terms of successes, failures and challenges. What are some of the best practices or creative solutions out there?

THE **DEADLINE**
FOR SUBMISSION
OF ARTICLES
IS **12 JUNE 2020.**

Submit your articles to the
Executive Secretary, WIOMSA at
secretary@wiomsa.org

Previous editions:



continued...

CALL FOR ARTICLES FOR A SPECIAL ISSUE ON COASTAL ECOSYSTEM RESTORATION

Guidelines:

- We are seeking **reader-friendly articles**, popular-magazine style, rather than in an academic style.
- Start your story with a **brief description of the restoration initiatives** including its aim and location.
- **The main aim of your story should be to describe what the situation before restoration was**, its objectives, techniques/methods used and rationale for their selection, actors involved and their roles, successes and challenges and how they were resolved. And what is the current status of the restored site? Highlight evidence of returned ecosystem goods and services.
- Finish the **article with lessons learnt and opportunities for replication** and long-term sustainability.

Specifications:

- Articles should be between **400-900 words** (approx. 450 words = one page, 900 words = 2 pages).
- **Photos in high resolution, jpeg format and preferably unedited** (or at least without special effects). Please do not send us images for which you do not have the copyright.

THE **DEADLINE** FOR SUBMISSION
OF ARTICLES IS **12 JUNE 2020**.

Submit your articles to the Executive Secretary,
WIOMSA at secretary@wiomsa.org



NAVIGATING
THROUGH
A CAREER
IN MARINE
SCIENCES

Seeing with eyes closed

BY KAREN BOWLES



Field work

“
[As a first-generation
PhD] I haven't known
what to expect for a lot
of my science career”

Tessa Campbell.

I remember reading Tessa Campbell's words a few weeks ago and thinking “*someone finally put it into words*”, but more importantly, “*I am not the only one*”.

There is something comforting in knowing that other scientists (particularly women) are, like you, trying to figure it all out. This is especially true when one works in a sector that can feel as though it is a taboo to fail, or to not know something, which is contradictory to the very nature of science and the scientific process.

“

Not knowing what to expect has allowed me the freedom to mould and reshape my beliefs, goals and objectives, as well as to shape what I see as my role in, and contribution to, research.

My career trajectory in the marine sciences and coastal and marine resource management, has not been a linear one. I enjoy not having to follow a blueprint and letting the path reveal itself as I go. However, that does not mean that it is a challenge-free and easy process.

Growing up in Mozambique, the possibility of a career in science was unheard of. There was no one in my family, a friend's family, or school who was a scientist. Quite frankly, I did not even know there were scientists, in any field, in Mozambique, until the last year of my undergraduate degree when I encountered WIOMSA for the first time. As ignorant as that may sound, I had never heard of or met a Mozambican scientist. **Therefore, it was no surprise that my family's response to finding out that I wanted to become an environmental scientist, was to give me puzzled and worried looks and to ask numerous questions:** “what is that? What do you do with it? What jobs can you get? How will you make money?” At that time, I did not have the answers to their questions. All I knew was that I enjoyed the scientific process and that my diverse interests all had a common denominator – the environment and how people interact with it.

Consequently, I picked the course that offered the most diverse topics in the area of my main interest and in spite of the uncertainty, and after much persuasion, my parents were supportive of my decision.

I had the privilege to do a Bachelor of Science Honours degree in Environmental Sciences in the United Kingdom where, in the first year, there was an opportunity to assist with some laboratory work for a professor studying carbon sequestration in the mangrove forests of Brazil. It was my first experience of what a researcher does. After that, I was determined to follow a career in academic research, so much so that the same professor became my supervisor on a similar pilot project that I developed for my dissertation. This was an assessment of the impacts of pollutants on carbon sequestration and storage in East-African mangrove forests. It was through this dissertation that the connections between research and policy became clear to me. **My interest in the impact of research on the environment and society, and how to apply the knowledge that was being generated, grew.** I started to deliberate about whether studying towards a doctorate was the right choice for me because I felt that I could not choose only one topic to focus



Trash collection during world's ocean's day

“

My career journey can be summarized into two words: advice for other women considering a career in marine sciences and/or in the field of coastal and marine resource management, and that is to take initiative. “Initiative” allowed me to achieve milestones that I thought would take years to accomplish, and I am certain it can do the same for you.

With students



on. More importantly, for the first time, I worried if my gender would affect my career.

When I returned to Mozambique, I worked in the field of marketing for a few months in order to muster the courage to apply for a job that was related to my degree. The experience of working in a consultancy exceeded my expectations. My background allowed me to fill diverse roles, from research and data analysis to contributing to conservation management plans and national strategies. I was involved in projects for organizations such as The World Bank, the Food and Agriculture Organization of the United Nations and the Wildlife

Conservation Society, to name a few. Prior to this, I thought that it took people years to be involved in somehow with such organisations. **One of the most gratifying moments, however, was seeing the shift in perception from those closest to me; it went from “what is it exactly that you do?” to “your work is important and useful”.**

It was around this time that it became clear to me that there are differences in my experience as a woman researcher and that of my male colleagues. Coincidentally, I found out that my employer at the time was a WIOMSA member. She was open to sharing her experiences and



Above: Karen Bowles testing the soil core.

say, however, that I have had male colleagues, superiors and figures whom I looked up to, that have been supportive, collaborative and contributed to my career.

Recently, I started to work as Research Manager at the Bazaruto Center for Scientific Studies (BCSS), a field research centre located in the Bazaruto Archipelago National Park (BANP). The opportunity to embark on this project was timely because I was eager to get more involved in research, challenge myself and explore certain interests more fully. My role entails contributing to the coordination and development of research projects in ocean acidification, long-term monitoring of anthropogenic impacts on marine ecosystems and wildlife, the BANP Ocean Observatory, marine litter, outreach and exploring how the in-house projects of the BCSS can have an impact on the local communities, conservation efforts, and possibly in decision-making.

the lessons she had learnt through the course of her career. One conversation we had stood out, it was something along the lines of: “you have potential and determination to inspire action, but you are a woman, you are young, and you look young, which means that you will automatically have to work harder to be heard.” That was not a lie.

It has been my experience that male colleagues are bolder and more unafraid to take risks and be in the forefront. If I were to take a similar risk and get something wrong, there are far more implications because there is an expectation to prove that I am qualified to take up a space. **It is important to**

Three points below are words of wisdom I wish had been given to me:

- It may feel intimidating to put yourself out there, so **you must be courageous to take risks.** However, know that most times courage is not just a decision, you may have to work at it to cultivate skills that will make you confident to take risks.
- Rejections are part of the process, don't take them personally.
- It is okay to seek and ask for help.

About **WIOMSA**:

The Western Indian Ocean Marine Science Association promotes the educational, scientific and technological development of all aspects of marine sciences throughout the Western Indian Ocean region with a view towards sustaining the use and conservation of its marine resources.

THE NETWORK FOR WOMEN IN MARINE SCIENCE (WiMS)

was launched during the 10th WIOMSA Scientific Symposium in 2017 to address the gender equality issues that are facing women marine scientists.

Join WiMS and sign up for membership at wims.wiomsa.org

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