



WIOMSA *Newsbrief*

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WIOMSA's future discussed in Mombasa

Between 18 and 23 October, three important WIOMSA-meetings were held in Mombasa, Kenya: the third Meeting of the Marine Science for Management (MASMA) Grantees, a MASMA Programme Committee meeting to decide what new projects will be funded by MASMA, and a meeting where WIOMSA's future strategy was discussed.

Mangroves role for food security, sustainable dolphin tourism, reef fish spawning and sustainable indicators for coastal areas – all of these are ongoing MASMA-projects that were presented and discussed during the three first days (read more about the findings in this issue). MASMA Programme annually organises a meeting where grantees attend and present their scientific results to the Programme Committee and invited experts.

Great interest

This year, MASMA received 42 Letters of Intent. Five were chosen to develop full proposals that were assessed for funding during the Programme Committee meeting. Three projects were selected:

“Larval settlement rates and reef fish recruitment dynamics in coastal Kenya: Implications for Fisheries management and Conservation in Eastern Africa”

“The Effects of Coral Bleaching on Coral Reef Fish, Fisheries, and Ecosystem Services in the Western Indian Ocean”

“Seabirds as bio-indicators of tropical marine eco-systems: a regional study in the Western Indian Ocean”

Two proposals for organisation of workshops were also approved. These were:

“Regional Workshop on Restoration and Management of Mangrove Ecosystem”

“Regional Workshop on Ecotoxicological Monitoring and Control of Agrochemicals in the West Indian Ocean Coastal Marine Environment”

Thank's to the scientists

Nirmal Shah, Chairperson of MASMA thanked the participants of the Grantees meeting:

- We believe that the MASMA programme has not only managed to fund ground-breaking projects, but also fostered intra- and intercountry collaboration. These are excellent results in themselves, and serves to reinforce your position as outstanding scientists, and through your success, also the prestige and position of WIOMSA. Thank you!

Future role

WIOMSA has existed for about ten years. As the organisation matures and the surrounding world changes, there is a need to look forward to define the future role and strategy for WIOMSA. Therefore, a consultant, Amanda Younge from South Africa, was appointed in August 2004, with a brief to draft a Strategic Plan to guide WIOMSA's activities over the next 15 – 20 years.

Strategic Plan under development

With help from the WIOMSA Board of Trustees members, WIOMSA Secretariat, the Country Coordinators, selected members, Heads of research and academic institutions in the region, and representatives of partners organizations such as UNEP, WWF and IUCN-EARO. Younge prepared a first draft of the WIOMSA Strategic Plan that was discussed in Mombasa. The Strategic Plan is now being redrafted and was presented to the Board for approval in the end of February.

Ongoing MASMA-projects October 2004

Potential for sustainable dolphin tourism

The MASMA-funded project about building capacity to develop, conduct and manage dolphin tourism has now one year to go, but has already come up with interesting results.

Between 1999 and 2003 the distribution and abundance of dolphins in the Menai Bay off the south coast of Zanzibar were investigated. The researchers photographed the dolphins from a boat and found about 160 bottlenose dolphins and 70 humpback dolphins in the area. The areas that the dolphins used most were relatively small, and about the same ones as the tourist boats covered. Therefore, there is a risk that the boats may disturb the dolphins in their daily rounds.

Middle aged Europeans

33 boat operators, six restaurant owners and 254 tourists in Kizimkazi were interviewed during the tourist season of 2003. The results showed that a large proportion of the dolphin watchers were middle age Europeans, predominantly from the UK (15 %) and Italy (13 %). A majority of them were between 20 – 50 years. A total of 6 735 tourists watched dolphins 2003. Much of the total money

generated by the dolphin tours is profiting tour companies and tourist guides outside the village. Therefore, the community, with the researchers assistance, has initiated a Dolphin Management Committee that will work for a united and better management of the dolphin tours.

By-catch - a threat

Apart from the unregulated tours, another threat to the dolphins is the by-catch - fishermen accidentally catching dolphins when fishing. During 2003, the estimated by-catch in the research area was 13 bottlenose dolphins and four humpback dolphins – 8 and 5,6 % of the whole population respectively, which is worrying, given that by-catch levels over 2 % are regarded as unsustainable. Studies about age structure and biology of by-caught dolphins is still going on.

No genetic exchange between groups

The dolphins are also vulnerable from a genetic point of view. Through DNA analy-

ses the researchers have come to the conclusion that the genetic exchange between dolphins from the north and dolphins from the south of Zanzibar is almost none. That makes them very susceptible to disturbances, if any, from the tourists, and to the common occurrence of bycatch.

Researchers:

Omar Ali Amir, Institute of Marine Science, University of Dar es Salaam, Tanzania

Per Berggren, Stockholm's University, Sweden

Narriman Jiddawi, Institute of Marine Science, University of Dar es Salaam, Tanzania

New understanding of reef fish spawning

Researchers from Seychelles and Sweden are investigating fish spawning aggregations and the reproductive biology for commercially exploited reef fish species, and are succeeding in transforming the results into management measures.

In Seychelles, a 3-year research and management project has yielded considerable data on the reproductive biology of vulnerable reef fishes. The researchers have identified fish spawning sites and spawning periodicity is described for *Epinephelus multinotatus* (White-blotched grouper), *Variola louti* (Louti grouper) and *Siganus sutor* (Shoemaker spinefoot). Spawning behaviour for aggregations of *Epinephelus polyphekadion* (Camouflage grouper), *E. fuscoguttatus* (Brown-marbled grouper), *Plectropomus punctatus* (Marbled coral-

grouper) and *S. sutor* has also been demonstrated.

One of the most important objectives of the MASMA-programme is to utilize the research results for management purposes, something that this project indeed has succeeded in - legislation for a management framework that will protect spawning aggregations in the outer islands, in the form of the Fisheries Reserves Management Areas (FRMAs), has been submitted to the Cabinet for consideration.

Researchers:

Roland Azemia, Seychelles Fishing Authority, Seychelles

Marlene Isidore, Seychelles Fishing Authority, Seychelles

Michel Marguerite, Seychelles Fishing Authority, Seychelles

Marcus Ohman, University of Stockholm, Sweden

Rondolph Payet, Seychelles Fishing Authority, Seychelles

Jan Robinson, Seychelles Fishing Authority, Seychelles

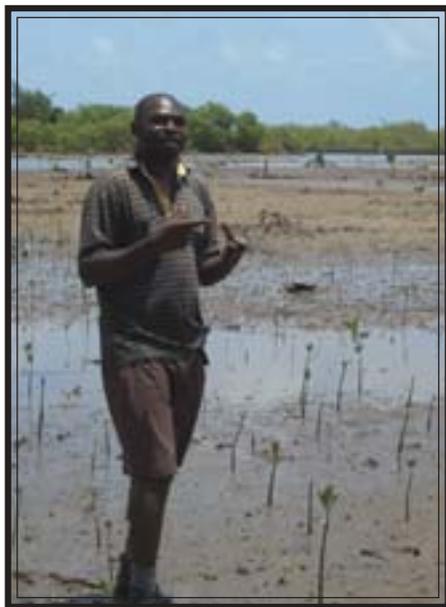
Latest technology used in mangrove studies

Mangrove distribution and the cause of degradation can now be determined by using Geographic Information System (GIS) as a complementary tool.

In their ambition to combine the ecological and economic value of mangroves, researchers from Kenya, Mozambique and Sweden have surveyed various aspects of mangrove-associated fisheries. The research was mainly carried out in Ungwana Bay, Kenya, and in Maputo Bay, Mozambique. In Ungwana Bay, aerial photographs and intensive ground truthing assessed the status of mangroves. The studies revealed eight species of mangroves. Three species, *Rhizophora mucronata*, *Ceriops tagal* and *Avicennia marina* dominated.

Fishing main economic activity

The researchers also investigated the socio-economic profile of the mangrove dependent fishery of Malindi-Ungwana bay. In the three investigated villages, fishing was the main economic activity for the men. Lately the catch per head has decreased and incomes declined, which has led to



Dr. James Kairo, Kenya Marine and Fisheries Research Institute, shows degraded mangrove at the project site in Ngomeni in Kenya.

rising conflicts between the artisanal fishermen and the prawn trawlers with whom they share fishing grounds.

Most fish in muddy, forested areas

When looking at fish density and diversity in forested and unforested mangrove in Kenya, the mean value was highest in forested sites with muddy substratum. However, biomass was highest in un-forested muddy substratum sites due to the presence of a few large fish. The unforested sandy substratum had least fish and least biomass. The results from fish landing observations indicate that 17 out of 32 fish species landed also visit the mangrove habitats. The 17 species account for ca 84 % incidence of the total fish landings and ca 65 % of the total catches in the mangrove.

Fewer crabs in degraded mangrove

In Mozambique, the researchers have, among other things, been looking at the abundance, size distribution and diet of the mud crab *Scylla serrata* in southern Maputo. Two microhabitats in the mangrove forest and one in the mangrove creek were sampled and compared. The results showed that crab density and biomass were higher in non-degraded mangrove and the creek channel, than in the degraded mangrove. Size structure showed dominance of juveniles and sub-adults, emphasizing the nursery role of mangroves for juvenile crabs.

Research still going on

The biology and the trade of the mud crab are still being studied in north-western Maputo Bay. Since April 2003 1, 071 crabs have been collected at three different market places and 614 fishermen, 385 sellers and 280 buyers have been interviewed. 90 % of the mud-crab fishermen used traps and fishing net to catch the crabs. Most captured and sold individuals were sub-adults.



Mangrove shoot at Ngomeni in Kenya.

Researchers:

Salomao Bandeira, University Eduardo Mondlane, Mozambique

James Kairo, Kenya Marine and Fisheries Research Institute, Kenya

Edward Kimani, Kenya Marine and Fisheries Research Institute, Kenya

Benard Kirui, Egerton University, Kenya

Adriano Macia, University Eduardo Mondlane, Mozambique

David Mirera, Kwetu training Centre for Sustainable development

Jacob Ochiewo, Kenya Marine and Fisheries Research Institute, Kenya

Patrik Ronnback, University of Stockholm, Sweden

New MASMA-projects October 2004

The Effects of Coral Bleaching on Coral Reef Fish, Fisheries and Ecosystem Services in the Western Indian Ocean

The project will evaluate the effects of coral bleaching and mortality on the coral reef communities, fish and fisheries in the western Indian Ocean through a combination of field studies before and after the coral bleaching even in 1998, and the development of a historical database on benthic and fish communities. The proposal will allow investigators to repeat fish community surveys completed by four investigators and regions (Kenya, Tanzania, Seychelles and Reunion) before 1998 to determine the changes and ef-

fects of coral mortality, management and remoteness on the changes in fish communities. A database of all historical published and unpublished studies on benthic and fish abundance and production in the western Indian Ocean will be developed for a meta-analysis of the spatial and temporal patterns of change. In addition, the proposal will draw from and provide partial support to the ongoing coral reef and fish landing monitoring programme of the Wildlife Conservation Society of Kenya, which has been investigating the effects

of changes in reef communities on reef ecology and fisheries. The combined results of these field studies will allow for the development and testing of ecological models to determine the ability of models to predict the observed changes and to develop scenarios for the effects of climate change on reef ecology and fisheries under different management scenarios and in different regions of the western Indian Ocean. The work will be done with the collaboration of 13 investigators and seven institutions active in this region.

Researchers:

T. McClanahan , Kenya	G. Rosine , Seychelles
J. Cinner , Kenya/Tanzania	P. Andre Adam , Seychelles
J. Kawaka , Kenya	P. Chabanet , Reunion
J. Maina , Kenya	L. Bigot , Reunion
N. Polunin , Seychelles	P. Durville , Reunion
J. Bijoux , Seychelles	M. Tessier , Reunion
N. Graham , Seychelles	A. Kamukuru , Tanzania
M. Stravens , Seychelles	M. Mohammed , Tanzania
N. Shah , Seychelles	H. Ali , Tanzania
S. Stead , Seychelles/Reunion	M. Ohman , Sweden/Tanzania
R. Quatre , Seychelles	S. Yahya , Tanzania



Larval settlement rates and reef fish recruitment dynamics in coastal Kenya: Implications for Fisheries Management and Conservation in Eastern Africa

Fish recruitment variability and larval supply have an effect on community structure, yield of stocks and function of marine parks. Despite this importance there is little data on reef fish recruitment in coastal East Africa and the WIO region in general. In particular, there is a general lack of knowledge about the sources of the larval and juvenile fishes found on reefs. Also, little is known about the rates at which fish settle from the plankton and hence the

extent to which fish stocks may be limited by larval settlement.

This project aims to assess and correlate the larval planktonic duration of fish larvae and their temporal settlement rates, with relative abundances of juvenile and adult coral reef fish species within different reef types in Kenya during 2005 and 2006. Larval supply, juvenile and adult fish abundances in protected and non-protected reef in

Kenya will be estimated using a combination of light-traps, fish-traps and visual transect data. The duration of spawning periods and larval planktonic periods of fish larvae will be discerned from otolith microstructure.

The project, the first of its kind in East Africa, will give a deeper understanding of the importance of reefs and surrounding seagrass areas for fish recruitment and population dynamics.

This new knowledge will be useful in marine park design and management of the fisheries.

Researchers:

Boaz Kaunda-Arara, Moi University, Kenya

James Mwaluma, Kenya Marine and Fisheries Research Institute, Kenya

Vidar Oresland, National Board of Fisheries, Sweden

Melckzedek Osore, Western Indian Ocean Marine Science Association, Tanzania



Seabirds as bio-indicators of tropical marine ecosystems: a regional study in the Western Indian Ocean

As top predators, seabirds are very sensitive to natural and man-induced changes in marine food webs. Their peculiar way of life (marine when feeding but terrestrial when breeding) makes them very accessible and easy to study, compared to typical marine top predators. For these reasons seabirds have been used as indicators of natural or man-induced changes of the marine environment at various places of the world, but few of these studies have been conducted in tropical areas. However in the tropics, seabirds are closely associated with surface-dwelling tuna, a major target of tropical industrial fisheries: by driving prey to the surface, tuna make them available to seabirds.

The aim of the research project is to start a long-term study on the feeding ecology, breeding parameters and population structure on the most abundant and main tuna-associated seabird

species of the western Indian Ocean (the Sooty tern). The project will also study three other species for comparative purposes. The goal is first to assess the possible impacts on the seabird ecology of natural and man-induced changes in food webs of the region. The study is a continuation of similar studies initiated in the Mozambique Channel in 2002. The aim of this proposal is to extend it to the Seychelles Basin, where seabirds are very abundant and coexist with an important and growing industrial purse-seine fishery.

Ultimately, the goal is to use seabirds as bio-indicators of the health of marine food webs in the western tropical Indian Ocean in order to conduct an ecosystem-based management of the marine habitats and resources of this region. An important part of the project will be devoted to training local students and staff, by increasing the links and ex-

changes between Seychelles institutions and NGO with the University of Réunion Island, in order to reinforce local research capacity.

Researchers:

Rachel Bristol, Nature Seychelles, Seychelles

Matthieu Le Corre, Université de La Réunion, Reunion

Laurent Dagorn, Seychelles Fishing Authorities, Seychelles

Chris Feare, University of Leeds, UK

Francis Marsac, Centre de Recherche Halieutique, Sète Cedex

Jaime Ramos, Universidade de Coimbra, Portugal

Gérard Rocamora, Island Conservation Society, Seychelles



Thesis Award on Migratory Species Conservation

Award of 10 00 Euro for thesis on migratory species. Application open until 30th April 2005

The Thesis Award on Migratory Species Conservation has been launched by the Secretariat of the Bonn Convention on Migratory Species (CMS), on the occasion of its 25th Anniversary in 2004, and is sponsored by National Geographic Deutschland and Lufthansa. The award of 10,000 EURO will be offered every three years at the Conference of Parties to CMS at alternating locations, and for the first time at the 8th meeting of the CMS Conference of the Parties (COP8) in November 2005. The Secretariat of the Bonn Convention on Migratory Species ad-

vertises this award to promote scientific research and conservation of migratory species, as defined by the convention. The thesis should provide new data and insights into the biology of migratory species or external factors disrupting their migration patterns. Research results must be applicable to conservation measures to the benefit of migratory species.

Online Application for the Thesis Award to be given in a ceremony at the COP 8 is now open until 30 April 2005 (http://131.220.109.5/groms/Thesis_Award/Award.html).

If your Internet connection does not allow online application, you can also send your thesis by mail to the Museum Koenig, with an accompanying letter explaining its relevance for species conservation.

Address:

PD Dr. Klaus Riede
Zoologisches Forschungsinstitut und
Museum Alexander Koenig
Adenauerallee 160
53113 Bonn
GERMANY

The Fourth WIOMSA Scientific Symposium

Advances in Marine Science in Western Indian Ocean Region: Contribution of Research in Improving Human Welfare and Poverty Alleviation

The Western Indian Ocean Marine Science Association (WIOMSA) and the Mauritius Oceanography Institute (MOI) have the pleasure of announcing the WIOMSA Fourth Scientific Symposium, with the theme: *Advances in Marine Science in Eastern Africa: Contribution of Research in Improving Human Welfare and Poverty Alleviation*.

The Symposium will take place from 30th August – 1st September 2005 at

the Grand Baie Conference Centre, Grand Baie, Mauritius. It will be preceded by the Mauritius National Ocean Science Forum (NOSF) to be held on the 29th August 2005 at the same venue. The Third WIOMSA General Assembly will take place after the Symposium, on 2nd September 2005. Field trips to different sites of interests have been organized for 3rd September 2005.

Important dates

31 March 2005

Deadline for submission of abstracts

30 April 2005

Notification of abstracts acceptance

30 June 2005

Deadline for application for travel grants

31 July 2005

Deadline for receipt of full papers

Call for MARG-1 Proposals

WIOMSA's Marine Research Grant (MARG) Programme seeks to enhance capacity to conduct research and increase our understanding on various aspects of marine sciences and offer opportunities for the presentation of results of the research work in different regional and international fora.

MARG-1 is awarded to individual scientists in the WIO-region to carry out well-defined research activities in

their countries/institutions. The initial duration (term) of MARG-I is 1 year, renewable for a maximum of one term. The maximum amount offered for MARG-I is US \$ 6,000.

Deadline for submission of **MARG-1** is 30th April 2005

More information at the WIOMSA website: www.wiomsa.org / Research and

Funds / MARG, or contact the Secretariat:

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The WIOMSA-meetings in Mombasa in pictures



Study visit to a degraded mangrove forest in Ngomeni.



Fishing boat in Malindi-Ungwana Bay, one of the study sites in the MASMA-project about sustainable use of mangroves.



Nyawira Muthiga, Kenya, pondering upon what missions that will be most important for WIOMSA in the future.



Melckzedek Osore, Zanzibar, and James Kairo, Kenya, conversing.



Nirmal Shah, Seychelles, and Yunus Mgaya, Tanzania, discussing during a tea break.



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