



THE NEXT GENERATION

Trained in Zanzibar by ZMT, young researchers head for an optimistic future

ON EXPEDITION

When the sun goes down over the sea off Stone Town and a cool evening breeze wafts through the narrow lanes of Zanzibar City, groups of young people meet in the little snack bars and share their experiences of the day: scientists from all over the world returning from diving in the reefs and seagrass beds, from working with local fishermen and from field work in the villages. None of them share the same background: different countries, different subjects, but they all know about each other and work hand in hand for a new epoch.

They do so because times are hard for tropical coasts: a boom in tourism, stressed reefs, coral bleaching, overfishing, too many nutrients in the water, algal growth and much, much more. The population of the island of Zanzibar is also forced to address these problems which are affecting ever more tropical coasts. "In the last resort, sustainable management to conserve resources must take account of the views of everyone involved," says ZMT director Hildegard Westphal. So, in all its projects, the institute's guiding principle is "Scientists must be trained to think holistically."

Diverse expertise for a clear objective

In Zanzibar, this is currently working perfectly. These dedicated scientists respond with convincing answers because they have enjoyed interdisciplinary training unlike any generation before them. Never have scientists been so connected and experienced in sharing their expertise. They spent three years on research at the Graduate School SUTAS (Sustainable Use of Tropical Aquatic Systems), a project developed and run by ZMT in cooperation with the Institute of Marine Science (IMS) at the University of Dar es Salaam in Zanzibar and the Leibniz Institute for Prevention Research and Epidemiology (BIPS) in Bremen. The SUTAS doctoral students have collected health data in the villages, inspected the drinking water supply, assessed fish stocks, analysed the local fishing methods, studied collaborative behaviour, established correlations between stressed seagrass beds and the nutrient input of polluted water, and observed the conditions and changes in the coral reefs. Now this manifold knowledge is being pooled – for future management that will take the economic and ecological needs of tropical coasts seriously and coordinate them to ensure long-term protection.



CONTENTS

The next generation	1
Who will rule the reef?	2
Knowing what they want	3
News/Imprint	4

WHO WILL RULE THE REEF?

Hauke Reuter observes a nondescript candidate

They belong to the class of anthozoans, organisms known for resembling flowers. This all sounds very colourful, but in the variegated community of coral-reef inhabitants Corallimorpharians tend to get lost. Flat, brown and elastic, they resemble a pancake resting on the reefs, shrinking and swelling like a sponge; individually they are easy to overlook. "Other diverse organisms" is the way the wobbly minority is often referred to by scientists observing the reefs. "We hardly know anything about this neglected group at all," says Hauke Reuter, the sort of finding that makes the conscientious ZMT ecologist uneasy.

Relations with no backbone...

Hauke Reuter does not easily become disconcerted – but Corallimorpharians have managed to disconcert him since he noticed how this species was proliferating at an unusual rate in the reefs off Zanzibar. Almost a quarter of the inhabitants of reefs near towns is composed of these strange relations of stone corals and, according to the scientist, that is "not normal" because when the population is excessive, the reef has a problem: it does not grow a skeleton. The descendents have, so to speak, no backbone. If they invade and overrun their rigid relatives, the reef loses its stability. So, a regime change of this kind could spell the end of the coral reef.

...but potentially fatal consequences

But here there are still many gaps in our knowledge which Hauke Reuter wants to close together with the students

he mentors and with Christopher Muhando from the Institute of Marine Sciences (IMS). Data is required: Why is this nondescript organism suddenly proliferating? Is it grabbing the opportunity while the reef is weakened? Are nutrients in the water like phosphates, nitrogen and iron promoting its growth? Which of its neighbours are keeping it in check? Which are succumbing to its assertiveness? Is it better adapted to adverse circumstances than its family; less sensitive to the warming of the water? And which marine inhabitants control the species simply by eating up their flower-like fellows?

Because the phenomenon of coral bleaching hit the reefs off Zanzibar quite recently, they are predestined for observing the possible spread of the invertebrate species. How will the reef now develop? Will it recover or be conquered and thus damaged yet more? Hauke Reuter's Colombian student Viviana Esteban Garcia is currently analysing the repopulation of corals on specially fired tiles that were anchored in Zanzibar's reefs at the end of September 2016. She is thus generating a tiny piece of knowledge in the puzzle that Hauke Reuter and his colleagues in Zanzibar would like to complete. "In the long term, we should like to build an integrative model of developments on the reefs that also includes Corallimorpharians and sponges." Only then will it be possible to replace speculation about a change of regime on the reef by valid prognoses, according to the circumspect ZMT researcher. "At present, there are no concrete signs one way or the other."

Hauke Reuter is leader of the group "Spatial Ecology and Interactions" in the Department of "Theoretical Ecology and Modelling" at the Leibniz Centre for Tropical Marine Research (ZMT) in Bremen. Since 2009, he has been cooperating intensively with colleagues in Zanzibar to gain a better understanding of reef systems and assess their development under changing environmental conditions. As part of this collaboration, they also train junior researchers.

KNOWING WHAT THEY WANT

Fishermen and researchers unite for sustainability:
Jennifer Rehren and Achim Schlüter on connected,
interdisciplinary science in Zanzibar

What problems do fishermen face in Zanzibar?

Jennifer Rehren: In the fishing villages, many of the fishermen are convinced that the resources in Chwaka Bay are being overfished.

Achim Schlüter: Also, there is a quarrel between two neighbouring villages which each use different fishing methods: dragnet and trap-fishery. In the past, the trawlers were constantly being accused of using environmentally harmful fishing methods and not being prepared to cooperate.

Are there solutions?

Achim Schlüter: All the fishermen realise that they have to pull together if they want to establish sustainable fisheries management in the region.

Jennifer Rehren: There have been attempts to prohibit trawling in the bay and to exchange illegal fishing gear. But this did not help the situation.

Achim Schlüter: It is because of the fishermen's economic dependence. A boat with trawls feeds about ten fishermen. If they were made redundant they would have to invest in their own fish traps and boats. And this is out of the question.

How can ZMT's interdisciplinary research help?

Achim Schlüter: Research on the socio-economic background is very useful when it comes to finding options for action. We have also studied collaborative behaviour in

the case of two villages and discovered that the use of sustainable fishing methods does not necessarily go hand in hand with a willingness to cooperate for more sustainable fishing. Rather, it depends on how experienced the fishermen are at working together. Local trawling requires more individual cooperation than trap-fishery which is carried out autonomously. Insights of this kind help everyone involved in their dealings with one another.

Jennifer Rehren: I also spent a year working together very closely with the fishermen on fisheries assessment of target resources in Chwaka Bay. We now know that in the case of three local fish species that are important in the region, there really are signs of overfishing, and we also know which fishing methods put them under the most pressure. Surprisingly, it is effective trap-fishery that is responsible for the most pressure. During a workshop with fishermen from three villages, I passed on these findings and discussed them with them. They accepted them and were quite willing to cooperate. The result was that the fishermen came out with very concrete suggestions as to how they should respond: one idea was a marine sanctuary where fishing would be prohibited; another was to create an artificial reef to increase the biomass. The fishermen's suggestions are now being discussed in the villages, and I am summarising them in a policy recommendation.

Fisheries ecologist Jennifer Rehren's doctoral thesis was supervised in Bremen and Zanzibar by the SUTAS Graduate School. Social scientist Achim Schlüter heads the ZMT research group on "Institutional and Behavioural Economics". ZMT's policy briefs seek to highlight the practical use of the institute's research and formulate concrete environmental policy recommendations for political decision-makers.

Dual leadership at ZMT

Hildegard Westphal and Nicolas Dittert will now be jointly running the business of ZMT. On January 16, 2017, Dittert, who has a doctorate in geology, became Managing Director alongside the Scientific Director Hildegard Westphal. Dittert is responsible for administration and infrastructure. [>MORE](#)



A new team: Hildegard Westphal and Nicolas Dittert

25th anniversary – new name – new design

Anniversaries are a cause for celebrations. In October last year, 25 years of tropical marine research in Bremen were celebrated with more than 140 guests from science, politics, business and society and a Senate reception in the upper hall of Bremen Town Hall. "ZMT makes a substantial contribution to researching tropical coastal ecosystems," said the Science Senator of the State of Bremen, Eva Quante-Brandt, honouring the institute's work. "It combines scientific excellence with an understanding of cooperation based on partnership, mutual respect and the sharing of experience." Two changes also signify ZMT's development: because ZMT's research covers a broad range of disciplines, from January 1, 2017, the Leibniz Centre for Tropical Marine Ecology will be known as the Leibniz Centre for Tropical Marine Research – still ZMT for short. "By changing our name, we are sending a clear signal about our approach to research, which is consciously holistic," explained ZMT Director Hildegard Westphal. So, publications like the Newsletter and ZMT's internet presence are also being given a new, more open and recognisable corporate design. [>MORE](#) | [>SEE PHOTOS](#)

Leibniz Environment and Development Symposium

It is all about global challenges, junior researchers' new ideas, interdisciplinary cooperation and regular ideas-sharing: The Leibniz Environment and Development Symposium (LEADS) is a new, regular event initiated by ZMT and three Leibniz Institutes for agricultural sciences. The debate forum was launched in Berlin in December, addressing the topic "From Food Production to Food Security". Doctoral candidates and postdocs presented international research from Pakistan, Indonesia, Ethiopia and Tanzania. In the coming years, symposia are planned on "Crises" and "Biodiversity". [>MORE](#)

EU Sustainability Conference at ZMT

From March 6 to 8, 2017 ZMT will host the first scientific conference under the EU COST Action "Ocean Governance for Sustainability". The European network will draw up a work strategy for the following three years focusing on land-sea interaction, area-based and fisheries management, deep sea resources, food security and the ocean, climate change, and ocean acidification. [>MORE](#)

Successful lecture series at ZMT

ZMT's lecture series "Bremen Earth and Social Science Talks" (BEST) has hit the ground running. Once a month at ZMT, top-class international experts offer insights into their research, generate ideas and encourage debate on a broad spectrum of topics at the interface of the natural and social sciences. [>MORE](#)

Alumni meetings in Zanzibar and Bremen

Successful consolidation of ZMT Network: more than 50 of the institute's alumni from 27 countries met in Bremen at the end of last October during ZMT's 25th anniversary celebrations. One month earlier, alumni from Kenya, Ethiopia, Southern Sudan and Tanzania had got together in Stone Town (Zanzibar) to discuss their current work. One important theme was to explore opportunities for future collaboration with one another as well as with ZMT. [>MORE](#)

