



Lisa Becking researches the coral reefs around the Raja Ampat islands in Indonesia.

‘Coral reefs are social-ecological systems’

Marine biologist Lisa Becking has just come back from an expedition to the coral reefs around the Raja Ampat islands in Indonesia. Her view of nature as a social-ecological system is reflected in the diverse crew she took along with her. At the university too, she is strongly in favour of diversity.

TEXT ROELOF KLEIS PHOTO ERIK MEESTERS

The coral reefs of the Raja Ampat islands to the west of the Bird’s Head Peninsula, West Papua, are a paradise on earth and home to nearly 600 species of coral and 1500 species of fish. But how long will these reefs withstand the consequences of warming seawater and a growing tourism industry, wonders marine biologist Lisa Becking. She is just back from an expedition to the region, where the team studied the state of the coral. For once, not because it is degraded. Actually, the coral here is thriving.

Many reefs around the world have been affected by ‘global bleaching’: increased seawater temperatures causing the world’s reefs to become bleached and die off. ‘But not in this area,’ says Becking. ‘Here the ecosystem appears to be resilient. Why is that? Is it the biology, the enormous diversity here, or could it be thanks to the manage-

ment of the six marine nature reserves in the area? And what can we learn from that for nature reserves in other parts of the world?’ Raja Ampat gets promoted for tourism purposes precisely because the reefs are still so beautiful. ‘That tourism context was important for this expedition’, says Becking. ‘Tourism has increased by more than a factor of 30 since I first went there 10 years ago, from 900 visitors per year back then to 30,000 now.’

The expedition went to two marine protected areas, which are exploited for tourism to differing extents. Almost pristine reefs were compared with spots visited by large numbers of tourists. The programme included the usual ecological measurements to gauge the quality of the reef. What was different about the expedition vessel the *Temukira*, though, was the make-up of her crew. Besides ecologists and biologists, there >



PHOTO BARBARA KIEBOOM

LISA BECKING

Lisa Becking (1978) is a tropical marine biologist and an assistant professor in Wageningen. She graduated in Biology at the University of Amsterdam (2004) and got her PhD at Naturalis Biodiversity Centre and the University of Leiden (2012). Becking has received various grants and last December won the L’Oréal UNESCO Award for Women in Science. Becking writes a monthly column in the Dutch newspaper *de Volkskrant*.

were also sociologists, economists, modelers and engineers on board. Ecological and hydrodynamic research at sea went hand-in-hand with sociological and economic research onshore. The firm conviction behind this is that nature conservation and the resilience of nature are inextricably bound up with human activity. 'Humans have a big impact on coral reefs,' explains Becking. 'We're taking a social-ecological approach to ensuring the resilience of the Marine Protected Areas in the face of growing tourism and development. This approach explicitly links the resilience of ecosystems to governance structures, economics and society.'

Is that a new insight?

'Not really. The human factor has always been an aspect of my work. The fieldwork always starts with a cup of tea with the kepala kampung, the village chief, to explain what we want to do and to ask permission to work in the area. Local people always join us on the boat, and I always learn loads from them about the area, their interaction with nature, their work and village life. Only it has never been part of my research before. At some point, I realized that half of what I observed never got into my papers. Nature conservation of coral reef systems depends on both ecological processes underwater and socioeconomic processes at work above the water line.

'It is important for the university to become more diverse'

I want to integrate those processes into my work more.'

So you need knowledge about humans in order to understand and protect nature better?

'Humans influence nature and nature influences humans. Nature reserves visited by lots of tourists are social-ecological systems. Tourism is a given, and trying to keep them away is no longer realistic. I think there is a better way of protecting nature by assuming that humans are an integral part of the system and thinking about how you can change behaviour and adapt policy. No, I haven't suddenly turned into a sociologist. My aim is still to understand the natural system, but that system has become larger for me, and now I work together with social scientists.' The effects of the tourism are clearly visible, especially on land, says Becking. 'You start seeing social change, in terms of the activities taking place in the village. Access to the area has increased substantially. Two years ago, there was a slow boat every two weeks;

now there are three high-speed ferries a week. There is an airport. The number of B&Bs, most of them huts on poles, has shot up. Villagers who used to live from fishing alone now combine it with tourism-related activities.'

Last December, Becking received the L'Oréal-UNESCO Award for Women in Science for her research in Raja Ampat. The aim of the award is to support women scientists in their academic career, thus contributing to getting more women into top academic jobs in the Netherlands. 'I am on a tenure track. Most scientists embark on that with the idea of working towards a professorship.'

Does a scientist have to be ambitious?

'I think all scientists are ambitious, only their ambitions take many different forms. At the moment the definition of a successful academic is extremely narrow: someone who is competitive, writes a lot of papers and brings in a lot of funding.'



EXPEDITION

The Resilience of the Richest Reefs expedition to the Raja Ampat islands (West Papua, Indonesia) in January studied the resilience of coral reefs in relation to diving tourism in the area. It was financed by the KNAW from the SPIN programme, and by the Dutch Young Academy. The team consisted of scientists from the Netherlands and Indonesia as well as local teachers, nature conservation organizations and policymakers. Besides Becking, WUR was represented by the coral ecologist Erik Meesters, the economist Eva van den Broek, the modeller Ingrid van de Leemput, the sociologist Machiel Lamers, and the PhD students Ludi Aji and Ery Atmodjo.



science, rather than expecting individuals, unrealistically, to excel at everything.'

Becking's ideas about diversity and her views on nature as a social-ecological system are reflected in the varied, international crew of the expedition she led. They did the research together as far as possible. So the ecologist went along on visits to villages, and the sociologist helped take measurements at sea. As far as is practical, of course. 'We talk a lot about multidisciplinary work, but it is quite difficult to put into practice,' says Becking. 'You don't speak the same language. By being in the field together in close proximity to the problem, and seeing how other people go about their work, you gain a better understanding of the kind of data people collect and how that relates to what you do.'

How did that work out?

'The cooperation was spectacular. Everyone had a very open attitude to it. I learned a lot from other people's methodologies and approaches. For example, natural scientists are used to following protocols and instructions for their work, and taking measurements. Sociologists do that too of course, but they deliberately leave some room in their conversations with people for serendipity, the unexpected and coincidental. That creates the possibility of obtaining unexpected but highly relevant information. That interests me. I want to see whether I can build it into my research design as well.' The aim is for this pooling of perspectives to lead to a more complete knowledge of the system. The L'Oréal-UNESCO grant gives Becking five months to flesh out the idea, which she is doing at the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) in Amsterdam. 'I get the space there to think, write and work on new ideas for proposals. It's funny really, that you need a grant to get a chance to think. The peace you need to be able to think associatively and come up with new ideas is really something we should build into our daily lives as scientists.' ■

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Lisa Becking studies the sponges of the coral reef.

What's wrong with that?

'In itself, it produces perfectly good scientists who do great research. The disadvantage is that such a narrow definition creates a very specific image of what makes an excellent scientist. It is important to broaden that image so that it reflects a range of different people. And by doing so, to make the university more diverse. It's not about lowering the bar, but about appreciating a more diverse range of qualities. Just as an ecosystem benefits from high diversity, I think the university is stronger – and, frankly, nicer – if it has people with diverse talents and qualities. Also, the complex scientific and societal challenges facing us today call for a range of different solutions and therefore for a range of different approaches and talents. Nationally, Wageningen scores poorly on the percentage of female professors. That could be partly due to that narrow definition.'

So we should make more room for diversity?

'Yes. Diversity includes gender and cultural background, and goes beyond them. It's

about being able to be a successful scientist in different roles and with different talents. That would include being an inspiring leader, for instance – people who know how to get the best out of their colleagues. Or people who are excellent teachers or who engage in dialogue with the general public. By changing the evaluation system, you create a different academic culture and make room for a wider range of people. The way the evaluation criteria at WUR currently work, to become a personal professor you have to be a "sheep with five legs", as we say in Dutch. I see extremely good scientists doubting if they should stay in academia because they don't recognise themselves in the evaluation criteria for full professor. But luckily, change is in sight. The Universities Association, the Dutch Research Council (NWO) and the Royal Academy of Arts and Sciences (KNAW) have written a position paper called *Room for Everyone's Talent*. In it, they argue for recognition and rewards not just of research and publications but also for valorization, science communication, and education. I think we should aim for teams of people with different talents. Team