

BOBLME Newsletter

Bay of Bengal Large Marine Ecosystem Project



DECEMBER 2013

Bangladesh, India, Indonesia, Malaysia, the Maldives, Myanmar, Sri Lanka and Thailand are collaborating through the Bay of Bengal Large Marine Ecosystem (BOBLME) Project to better the lives of their coastal populations by improving regional management of the Bay of Bengal environment and its fisheries.



Bangladesh



India



Indonesia



Malaysia



The Maldives



Myanmar



Sri Lanka



Thailand

Where the grass is greener

The Seaweed and Seagrass Research Unit of Thailand's Prince of Songkla University, supported by the BOBLME Project, staged a successful week of seagrass conservation and monitoring in Myanmar at the end of April and beginning of May.

Led by Dr Anchana Prathep, the course brought together some 20 young researchers from various Myanmar government institutes and NGOs, in collaboration with Mawlamyine University, represented by Prof U-Seo Htun.

The first few days of classroom lectures at Mawlamyine University were followed by field excursions from Ngapali on the coast of Rakhine Division in the west of the country.

Dr Anchana reported afterwards, "The participants were very enthusiastic throughout the course. For some of them this was the very first time they had learned about the importance of seagrass ecosystems. It was also the first time some of them had used snorkeling equipment to allow them to explore the seagrass ecosystem close-up."

The training also included how to use the HOBO sensors for light and temperature, using GPS receivers to mark and map the seagrass bed, and setting up the permanent monitoring plots using the SeagrassNet protocol.

The training also emphasized climate change and how seagrass could help store carbon under the Blue Carbon scheme. "The participants attended actively and asked questions; and con-



Dr Anchana (left) briefs students before another dive on the seagrass beds.

cluded they were determined to conserve their seagrass beds."

Dr Anchana was impressed by the condition of the seagrass beds off Rakhine. "We visited several sites and the seagrasses were very healthy and beautiful. The water was also very clear."

The meadows contained a wide variety of seagrasses, including *Halophila ovalis*, *H. decipiens*, *H. beccarii*, *Halodule pinifolia*, *Halodule uninervis*, *Thalassia hemprichii*, *Enhalus acoroides*, *Cymodocea serrulata* and *Syringodium isoetifolium*.

"It is very important for the country to have established the baseline data to try to conserve the seagrass beds," Dr

Anchana said.

"These are still very much in pristine condition compared with those in other countries in the region, where seagrasses are known to be in drastic decline due to coastal development, despite this region being known to be a hotspot of biodiversity for the world's seagrasses.

"More training should be carried out to promote seagrass conservation in Myanmar and also in other countries around the Bay of Bengal, such as Indonesia, Sri Lanka and the Maldives, where seagrass provides an important habitat for a variety of economic species but where very little is known about the seagrass in the area."



Norad





Workshop participants take time out for a group photograph. Below, the subject of the workshop, the Indian mackerel.

Harmonising mackerel research

Participants from fisheries research facilities in all of the BOBLME Project's eight countries in August attended an eight-day workshop on mackerel genetics at the Central Marine Fisheries Research Institute (CMFRI) in Kochi, India.

The aims of the Indian Mackerel Genetics Harmonization Workshop – organised by India's National Bureau of Fish Genetic Resources (NBFGR) and the BOBLME Project – were to standardise methodologies and approaches to genetic stock structure identification work on mackerel (*Rastrelliger kanagurta*), and to offer training.

At the opening ceremonies former CMFRI Director Dr E G Silas presented some background information on what is known about Indian Mackerel genetic stock structure.

Presentations were also given by Dr A Gopalakrishnan, the CMFRI's current Director; Dr JK Jena the NBFGR Director, Dr V S Basheer, NBFGR Scientist-in-charge; and Mr Candy, the BOBLME genetics consultant.

Rudolf Hermes, the BOBLME Project's Chief Technical Adviser, provided the participants with an overview of the different Large Marine Ecosystem (LME) Projects worldwide, and then specifically the ongoing BOBLME Project of which the Indian Mackerel Genetic study is but one of many areas of work, all addressing transboundary issues of fish overexploitation, habitat degradation, and land-based pollution.

As far as the fisheries work is concerned, he explained, there are stock status reviews, and assessments, research programs (including this one on Indian Mackerel genetics), stock assessment capacity development, creation of regional fisheries management advisory committees and training courses, and defining performance indicators for fisheries management.

The workshop manual developed by the NBFGR lab staff specifically for this workshop was distributed to CMFRI and NBFGR staff, and BOBLME participants.



A shoal of Indian mackerel.

Photo by www.redseaexplorer.com

During the following days, activities generally consisted of morning lectures followed by afternoon practical training in the lab for the participants.

As the post-workshop report written by the NBFGR explained, "Standardization is an important part of multi-lab genetic studies this is to ensure laboratory processes in different laboratories will produce the same allele calls.

"Ideally before running any country samples a standard set of individuals would be run by all labs.

"However, due to the short timeline for completion of the project by February 2014, it is instead planned that two fish are run for every 96 fish submitted to the genotyping facility.

"If all labs run the same two fish then we should all get the same allele calls, indicating that the rest of the fish on that plate would be scored the same, independent of which lab the samples were run in."

The report noted, "Time is limited because the BOBLME project is scheduled to end by March 2014 and all work must be completed and reported upon.

"Each country was asked to complete a time line and outline any anticipated

limitations which could interfere with the completion data."

It added, "The role of NBFGR is to collect, classify, and catalogue the fish genetic resources of the country as well as the maintenance and preservation of genetic material and conservation of endangered species.

"The bureau is also responsible for the evaluation of indigenous species and the impact of exotic species.

"NBFGR is in a unique position since India is one of 12 mega-biodiversity countries containing four of 32 biodiversity hotspots worldwide.

"India contains 7.5 per cent of the world's biodiversity and a total of 2,508 known fish species and 291 exotic fish species.

"The bureau has conducted genetic stock structure work on 24 fin fish and five shellfish species using mitochondrial DNA, microsatellites and allozymes and barcoding over 450 species.

"NBFGR takes on the role of conservator by gamete cryopreservation, live gene banks, enhancement through ranching and captive breeding, and the collection of cell lines and stem cells."

Minister opens ICM centre

The Honourable Minister for Fisheries, Shri N G Pannir Selvam from the Government of Puducherry, opened the new BOBLME Integrated Coastal Management (ICM) Resource Centre in Puducherry on October 4.

The opening was attended by about 50 people, including the local fishing community as well as officials from the Department of Fisheries, the BOBLME Regional Coordinator Dr Chris O'Brien and the National Coordinator Dr K Vijayakumar.

Dignitaries lit the auspicious lamp before declaring the facility as the knowledge hub for ICM activities in Puducherry.

BOBLME-India has been implementing a programme of work on ICM for several years.

Led by Dr Vijayakumar, this initiative is working with the community, administration and stakeholders to promote ICM approaches in Puducherry - a district of just 293 square kilometres on the east coast of India, just south of Chennai.

Puducherry is small in area but is home to over 1.3 million people, so the pressure on coastal resources is considerable.

The Department of Fisheries and



The Minister snips the ribbon to open the Centre officially, watched by BOBLME Project Regional Coordinator Dr Chris O'Brien (left) and National Coordinator Dr K Vijayakumar (right).

Fishermen's Welfare is hosting the ICM Resource Centre at its new offices in the local fishing harbour complex.

The centre will enable ICM practitioners to meet in comfortable modern

surroundings and is equipped with a computer with internet access and a printer; and it already boasts a good collection of literature, with subscriptions to a range of journals.

EAFM courses launched

The Ecosystem Approach to Fisheries Management (EAFM) is a practical way to implement sustainable development principles for the management of fisheries by finding a balance between ecological and social well-being through good governance.

The first training session of the "Essential EAFM" course took place over six days in late June in Kota Kinabalu in Sabah, Malaysia, and involved more than 30 trainees, candidate trainers, and EAFM experts.

This new training course is the result of a unique partnership involving the BOBLME Project, the Asia-Pacific Fisheries Commission, the US Coral Triangle Initiative, the US National Oceanic and Atmospheric Administration and the Coral Triangle Support Partnership.

Local hosts for the training were the Department of Fisheries Sabah, Universiti Malaysia Sabah, and WWF Malaysia.

Dr Rudolf Hermes, the BOBLME Project's Chief Technical Adviser, and one of the authors of Essential EAFM, said the course has been developed because understanding of EAFM is still very limited, and there is confusion with other management approaches and tools.

As a result, resource managers in general are having trouble putting the theory of EAFM to practice. Participants in the Essential EAFM Course actually take home a draft EAFM plan.

This first course was used to test the training materials in a realistic training situation and to get feedback for fine-tuning



EAFM pilot course participants show off the results of their efforts.

and finalization of the training material.

It also served to build knowledge and skills on EAFM and to start the development of a regional pool of EAFM trainers.

The training package consists of a handbook, workbook, toolkits, trainer manual, powerpoint presentations and session guides. These can be downloaded from the BOBLME website (www.boblme.org/eafm-training.html).

www.boblme.org/eafm-training.html).

The pilot course was followed by a four-day training of trainers course, involving 11 of the participants in the pilot course.

The Essential EAFM training course (with training of trainers) will be held in January 2014 at the SEAFDEC Training Department.

Counting achievements

The BOBLME Project's National Coordinator in Sri Lanka, Dr S S K Haputhantri is only in his forties but has already packed his life with achievements.

Born in Colombo, Dr Haputhantri – Sisira to his friends – graduated from the Science Faculty of the University of Colombo in 1994 with an honours degree in mathematics and was promptly employed by the university as an Assistant Lecturer.

Three years later he joined the National Aquatic Resources Research and Development Agency (NARA) as a Research Officer. NARA is the principal national institute in Sri Lanka, charged with the responsibility of carrying out and coordinating research, development and management of aquatic resources.

While working there he continued his studies, obtaining a master's degree in Industrial Mathematics from the University of Sri Jayewardenepura in 2000 with a research project that had relevance to fish population dynamics, addressing the parameter uncertainties in the Beverton and Holt Model in Fisheries and their impacts on optimal fishing strategies.

The following year he was transferred to the Marine Biological Resources Division of NARA. "This," he says, "was a turning point in my career. I received an Asian Development Bank scholarship to pursue a PhD in France."

He enrolled in 2002 in the École Nationale Supérieure Agronomique de Toulouse (ENSAT) and two years later was awarded a *très honorable* (very honorable) doctorate in Fish Population Dynamics, his thesis having assessed coastal fishery resources in Sri Lanka using single-species and multi-species (ecosystem based) approaches.

Research is in his blood. "I have conducted a number of research projects on various aspects of fisheries, ranging from assessments of small pelagic fish, large pelagic fish, shrimps and oyster, food web analysis in the coastal fishery of Sri Lanka, climate change and fishing impacts on the marine fish and developing sampling strategies for fishery dependent data collection.

The quality of his research has been recognised internationally. In 2007 and 2008 he was a United Nations University Fellow at Iceland's Marine Research Institute and in 2010 a Visiting Scientist at the Leibniz Center for Tropical Marine Ecology (ZMT) in Germany.

He has published a number of research papers in both local and international journals. In 2009 he and his co-authors, J Moreau and S Lek, were joint runners-up in the Gopal Kanji Prize, awarded annually for the best articles published in the *Journal of Applied Statistics*.

That article looked at gill-net fishing for sardines off Sri Lanka using different statistical techniques. Another



Dr Haputhantri believes the Bay of Bengal will be a better place, thanks to the BOBLME Project

research paper titled *Trophic interactions in the coastal ecosystem of Sri Lanka: an ECOPATH preliminary approach*, written with J Moreau and C-M Villanueva, and published in 2008 in *Estuarine, Coastal and Shelf Science* received Presidential Awards for Scientific Research.

In the same year he was appointed Head of NARA's Marine Biological Resources Division (MBRD), a wider role that saw him representing Sri Lanka at a number of local, regional and international technical and consultation meetings or workshops, including working parties of the Indian Ocean Tuna Commission (IOTC) and BOBLME technical meetings.

It is a job that fits him well. "It is a great pleasure for me to serve as a researcher as well as a head of a technical division of NARA," he says.

On June 1, 2009, he added the post of National Coordinator of the BOBLME Project for Sri Lanka to his portfolio. It's a responsibility he wholeheartedly embraces.

"It is a great experience for me to work with a wide range of local and regional stakeholders through this project.

"I know of no other project in the region that has such a wide range of objectives, identifying and resolving transboundary water-related issues such as overexploitation of regional fish

stocks, degradation of critical habitats (particularly coral reefs and sea grasses) and land-based pollution.

"Without the regional cooperation among the eight Bay of Bengal countries that has been built under the BOBLME umbrella, no single country would be able to resolve problems of this magnitude.

"The BOBLME project has already laid a solid foundation through a number of regional and sub-regional initiatives to conserve the Bay of Bengal large marine ecosystem and its resources.

"I strongly believe that the Bay will be a better place thanks to these initiatives.

"Apart from that, BOBLME plays a vital role in capacity building of fisheries and environment institutes of the member countries and I see this as a valuable investment for the future."

Sri Lanka, he notes, has successfully implemented BOBLME Project activities at national level and has already achieved "good progress" in terms of project implementation:

- * The Sri Lanka National Plan of Action for Conservation and Management of Sharks was drafted and adopted by the stakeholders at a national workshop held in Colombo recently.

- * The comprehensive study on Indian Mackerel is progressing well. This includes a genetic study for determining the Indian Mackerel stock structure in the Bay of Bengal (see also page 2).

- * Marine Protected Area (MPA) work at Bar Reef Marine Sanctuary is going well. Bar Reef is the largest MPA in Sri Lanka and proposed activities by the project include assessment of management effectiveness, awareness raising and compliance generation at the sanctuary.

- * Sri Lanka is in the process of strengthening data collection and reporting systems on coastal and off-shore large pelagic fisheries of Sri Lanka. (This project is supported financially by the BOBLME Project, with technical support from the IOTC.)

Sri Lanka has already achieved a good progress with respect to compliance with IOTC resolutions on the data collection of IOTC species.

- * Sri Lanka has successfully undertaken other projects funded by the BOBLME project and in collaboration with other local project partners including IUCN Sri Lanka, University of Ruhuna, Department of Fisheries and Aquatic Resources and SLAFAR (Sri Lanka Association for the Fisheries and Aquatic Resources) etc.

And just in case anyone is tempted to believe that Dr Sisira's life is nothing but work it should be noted that in 2000, he married Ms H M Y Priyadarashanee, an Information Technology Officer at the Ministry of Agriculture.

"I am the father of two sons who are following their primary education in a leading government school in Colombo," he says with pride.

ABOARD THE NANSEN

Myanmar researchers join Bay of Bengal survey



End of the voyage. Four of the researchers from Myanmar pose for a last photo before disembarking from the Nansen.

A scientific survey is currently underway to assess fish resources, marine biodiversity and oceanography in Myanmar waters and in a wider Bay of Bengal context.

The survey was made possible by funding from the Norwegian Agency for Development Cooperation (Norad) in cooperation with the BOBLME Project.

The funding has brought a significant addition to the range of national activities in Myanmar and regional activities: the use of the Norwegian research vessel *Dr Fridtjof Nansen*, on a voyage involving Myanmar scientists and government officials.

The FAO has been collaborating with Norad and the Institute of Marine Research of Bergen, Norway, to carry out fisheries resources and environment surveys in developing countries in Africa, Asia and Latin America using the *Nansen* since 1975.

This is not the first time that the *Nansen* has carried out research in the waters of Myanmar - it carried out similar surveys in 1979 and 1980, establishing important benchmark information on the state of marine resources.

The 2013 survey is expected to massively improve understanding of the status of the marine resources, and provide information essential for informed man-

agement and sustainability of Myanmar's marine resources for years to come.

Two of the Myanmar scientists aboard, Prof. San Tha Tun, Myeik University and Dr. Htun Thein, Department of Fisheries, reported.

"Our economy is highly dependent on fisheries resources as well as supplies for healthy food. It is important to gain knowledge about the marine ecosystem, study the climatic and human impact and to establish a control and management system for sustainable harvesting of the resources.

"We are learning to use a systematic and repetitive sampling method with different kinds of equipment, such as nets with different designs for capturing organisms of various size classes.

"We also use different laboratory techniques to treat the samples before storage for later biomass calculations and taxonomic analysis on shore.

"This experience will help in our teaching and further research. We are experiencing a spirit of good cooperation aboard with crew, steward, chief, engineers, technicians, scientists, officers and captain working together to obtain good scientific results.

"We appreciate all participants' enthusiasm, encouragement, forbearing guidance and excellent service helping



The RV Dr Fridtjof Nansen.

to improve our studies and make our research onboard enjoyable."

The regard was mutual. On December 18 Dr Kathrine Michalsen of the Norwegian Institute of Marine Research reported, "Today the scientists from Myanmar were picked up by a local fishing vessel and the current cruise with the *RV Dr Fridtjof Nansen* is over.

"It became suddenly very quiet on board and we immediately missed our dear friends.

"They have all worked hard and their good humor and working spirit have impressed and inspired us. It has been an amazing survey in many ways."

Delta scoping report complete

The scoping phase of a two-phase project to identify the vulnerability and resilience of the Ayeyarwady Delta in Myanmar, requested by Dr Chris O'Brien of the BOBLME Project, and funded by the Project and the Global Water Partnership, has been completed.

The objectives of this phase, the Identification Mission, were threefold: To identify the possibilities and constraints of conducting an assessment of vulnerability and resilience of the delta; to prepare a plan for conducting a full assessment of vulnerability and resilience; and to deliver a preliminary description of the vulnerability and resilience of the Delta.

This scoping phase was undertaken by the Delta Alliance team, Wim van Driel from the Dutch environmental research institute Alterra and Tjitte Nauta of Deltares, an independent institute for applied research in the field of water, subsurface and infrastructure, also based in the Netherlands.

Based on their findings, a phase 2 project will attempt the elaboration of the Ayeyarwady Delta description and assessment. This will have two main objectives:

To elaborate an assessment of vulnerability and resilience of the Ayeyarwady delta; and to make a brief comparative analysis related to 10 other deltas worldwide that have already been studied by the Delta Alliance, which aims to connect people working in different deltas to allow them to learn from each other.

The project was given particular relevance by the destruction wrought in May 2008 by Cyclone Nargis.

As the Scoping Phase report notes, "The Ayeyarwady Delta fans out from the limit of tidal influence at Myan Aung to the Bay of Bengal and Andaman Sea.

"The delta region is densely populated, and plays a dominant role in the cultivation of rice in rich alluvial soil as low as just 3 meters above sea level, although it also includes fishing communities in a vast area full of rivers and streams.

"It is mainly populated by farming and fishing communities in several villages besides market towns, mostly located along the main rivers."

These were the communities and activities worst hit by Nargis, "which reportedly killed 84,537 people with 53,836 people missing, and left about 2.4 million affected. Total damage and loss is approximately 11.7 trillion Kyats (US\$4.1 billion)."

Van Driel and Nauta conclude that there are multiple challenges being faced with the opening up and democratisation of Myanmar.

"The Ayeyarwady Delta will inevitably factor significantly into Myanmar's economic development and emergence as a major regional trade route," the report.

"At present, however, the Ayeyarwady Delta is still largely undeveloped and the uncoordinated exploitation of its resources in some (upstream) areas may pose serious threats to the health of the delta."

However, they note that delta ecosystems such as the Ayeyarwady Delta



Apart from the death Cyclone Nargis wrought six years ago, it also flooded vast areas of farmland and villages in the Ayeyarwady Delta. Photo by DFAT, Australia



The Ayeyarwady Delta. Base map: Google Maps

"have a substantial adaptive and resilient capacity ... delta ecosystems, such as mangroves and marshes develop fairly quickly into rich habitats once the environmental conditions are favourable again.

"Worldwide, successful examples show the importance of good knowledge of the basic physical and ecological processes, early involvement of local

stakeholders leading to a participatory planning process, and an integrated and sustainable approach to manage and develop the delta to cope with the new economic situation in Myanmar."

The report notes that the Ayeyarwady Delta already demonstrates the first signs of significant changes: exploitation of the mangroves, overfishing, river bank erosion and deterioration of water quality.

"However, using the ecosystem approach, deltas can be used by the local people without compromising the integrity of these systems or overexploiting their natural resources.

"It is stressed that additional measures should be adopted such as improving conservation awareness, fighting poverty, improving the weak systematic biological monitoring systems, stimulating grassroots support for conservation and strengthening law enforcement."

The researchers reported that they had received excellent support on the ground, particularly from the Myanmar Irrigation Department, and recommended that Phase 2 of the project should go ahead.

RAMA buoy relaunched

The Bay of Bengal Ocean Acidification (BOBOA) moored buoy was redeployed after maintenance on November 23, 2013, from the Indian Research Vessel *Sagar Nidhi*.

Thanks to funding from Norwegian Agency for Development Cooperation (NORAD), the BOBLME Project supplied a set of biogeochemical sensors that were fixed to the underside of the buoy.

This is the first CO₂ flux and ocean acidification buoy to be moored in the northern Indian Ocean.

Data from the buoy, moored at 15°N, 90°E – about 400km west of Myanmar and 800 km south of Bangladesh – will assist in understanding of the large intraseasonal, seasonal and interannual biogeochemical variations in the Bay of Bengal, and track how the marine ecosystem in the Bay is changing over time.

Establishment of this time series was made possible through a close partnership between the BOBLME Project, NOAA's Ocean Acidification Program, the Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA), NOAA's Pacific Marine Environmental Laboratory, the Indian National Centre for Ocean Information Services, and the National Institute of Ocean Technology.

The Bay of Bengal is a region of strong ocean-atmosphere interactions. Air-sea flux of heat and CO₂ is heavily influenced by severe tropical storms and by large intraseasonal, seasonal and interannual variations in surface heat and fresh water fluxes.

In addition to the suite of meteorological sensors measuring winds, air temperature, rainfall, etc. and subsurface sensors measuring ocean temperature, salinity, and velocity this RAMA buoy is now measuring pCO₂, pH, and other biogeochemical parameters at the ocean surface and marine boundary layer air pCO₂. The Bay of Bengal Acidification (BOBOA) mooring is the first acidification mooring in the northern Indian Ocean. The data are provided at www.pmel.noaa.gov/co2/story/BOBOA.

BOBOA is part of the RAMA array and the global network of Ocean-SITES time series flux reference sites.

This project brings together scientists from the US and the BOBLME countries (India, Bangladesh, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, and



The RAMA buoy, with the BOBLME-supplied sensors attached below the body.

Thailand) to collaborate on long term, sustained ocean observations to better understand the role of the Indian Ocean in the global carbon cycle, and how it is changing over time.

RAMA itself is part of the Global Tropical Moored Buoy Array, which NOAA describes as a multinational effort to provide data in real-time for climate research and forecasting.

Apart from RAMA, the major com-

ponents in this extensive chain of buoys are the TAO/TRITON array in the Pacific and PIRATA in the Atlantic.

The major phenomenological foci of this array are the El Niño/Southern Oscillation (ENSO) in the Pacific; the interhemispheric dipole mode, equatorial warm events, and hurricane activity in the Atlantic; and the monsoons, the Indian Ocean Dipole, and intraseasonal variability in the Indian Ocean.

Fishermen rescue buoy that went AWOL

An oceanographic data buoy, one of 19 so far moored across the Indian Ocean as part of the Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA), went walkabout in July.

The buoy, usually located in the eastern Bay of Bengal area, broke its mooring and started an unexpected journey to Myanmar.

The buoy was tracked by satellite meandering around the northern islands of Myeik Archipelago before moving off quite deliberately towards Myeik.

After some excellent detective work by the BOBLME National Coordinator in Myanmar, Mya Than Tun, Fisheries Officers located the buoy at the Myeik Fishing Jetty, and in good

condition. It had apparently been rescued by a local fishing boat.

The National Oceanic and Atmospheric Administration (NOAA, USA) Pacific Marine Environmental Laboratory and the National Institute of Ocean Technology (NIOT, India) maintain the RAMA buoys and hope to have the wayward unit back in service in the near future.

Another 10 buoys are due to be deployed to complete the array.

The BOBLME Project and NORAD are supporting RAMA by providing a set of biogeochemical sensors that will contribute to a better understanding of Indian Ocean monsoon and climate change impacts (see main story on this page).

A+ for Chilika Report Card

Considerable interest has been aroused by the publication of Asia's first Ecosystem Health Report Card, which addresses environmental issues in and around Chilika Lake, a brackish water lagoon in Odisha State on the east coast of India.

Chilika Lake supports around 200,000 fisherfolk and is the wintering ground for more than a million migratory birds. It was the first place in India to be designated a wetland of international importance.

The Report Card is the product of a workshop earlier this year that involved the Global Partnership for Nutrient Management – of which the BOBLME Project is a member – the Chilika Development Authority (CDA), the Government of Odisha, the National Centre for Sustainable Coastal Management (NCSCM) and the Ministry of Environment and Forests (MoEF).

It was supported by the BOBLME Project; the UN Environment Programme (UNEP); the Institute for Ocean Management, Anna University, Chennai India; the NCSCM, the MoEF, the Government of India and other partners.

The Report Card is aimed at understanding the bio-geochemical process and fluxes of nutrients in Chilika Lake. It also estimates the overall water quality status, biodiversity and fisheries of Chilika Lake, along with the coastal water quality in the adjacent Bay of Bengal.

The Report Card provides rigorous scientific assessment of key parameters based on well-defined threshold values which can serve as a tool for management of Chilika Lake and its basin.

What makes it particularly useful is that it also communicates the science and complex information in simple terms, using graphics capable of engaging various stakeholders, from policy makers and resource managers to coastal communities, in taking responsibility for the management of the lake's ecosystem.

The development of the Report Card for Chilika Lake was a pilot activity under the UNEP/GEF project "Global foundations for reducing nutrient enrichment and oxygen depletion from land-based pollution, in support of Global Nutrient Cycle".

In preparation for the 'Report Card'



Chilika Lake supports 200,000 fisherfolk and a million migratory birds.

Photo by Proxy Indian

the CDA, in partnership with NCSCM, organized two expert group meetings to reach consensus on the indicators, and their values for establishing ecological thresholds in determining the health of the river, estuary and the bay.

They analyzed existing data, did field research to collect relevant data to fill data gaps and, finally, carried out a modeling exercise to assign scores for different ecological zones of the Chilika Lake and an overall score for the Lake.

The resultant Report Card, based on the 'pressure-state-response' framework for environmental management, finally concludes with key management recommendations.

In addition, the concept of the ecosystem health report card was discussed with various stakeholder groups of the Chilika Lake area in simple terms by holding meetings. These meetings welcomed the idea.

The Governing Body of the CDA, headed by the Chief Minister of Odisha, approved the 2012 Chilika Ecosystem Health Report Card at its meeting on November 13.

The Report Card has attracted wide attention. In India, replication of the Ecosystem Health Report Card is to take place in

several coastal states. The State of Gujarat has already organized the first meeting and started collecting relevant data for its own Report Card.

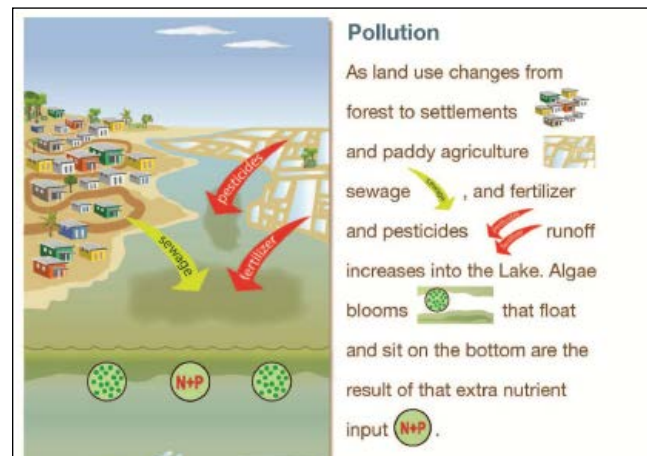
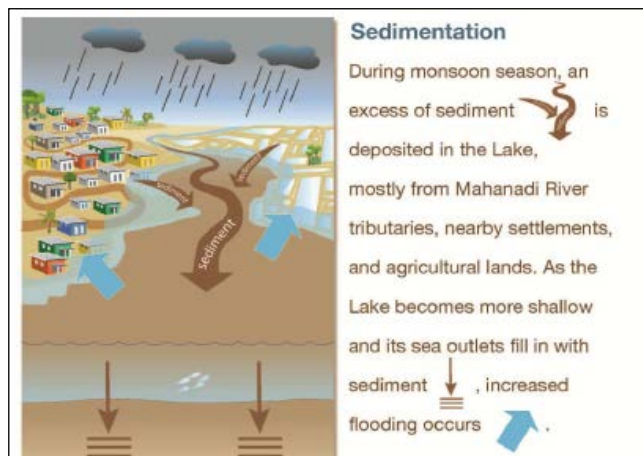
Interest has also come from outside India. The Laguna de Bay Authority of the Philippines has expressed interest in using the "Report Card" approach to understanding and managing the Laguna de Bay, the largest lake in that country. The Laguna de Bay Authority was due to host the first expert group meeting in Manila in December.

The CDA Chief Executive presented the Report Card at the Asia Regional Workshop on Scientific and Technical Support for Implementation of the Ramsar Convention, which took place in October in Changwon, South Korea.

The Committee welcomed this approach and decided to replicate the Report Card methodology in assessing the health of the ecosystem of its designated sites.

The 2012 Chilika Lake Ecosystem Health Report Card, produced with the support of the BOBLME Project, can be downloaded from www.ncscm.org.

Accessible science: Some of the engaging infographics used in the Chilika Lake Ecosystem Health Report Card.



PSC mandates 1-year project extension

The BOBLME Project Steering Committee met in Chennai, India on March 20 and 21.

The PSC was well satisfied that the Project was on track; moreover, given projected savings in the budget, it instructed the RCU to request a one year, no-cost extension from the GEF to extend the Project completion date to March 31, 2015.

The PSC welcomed the latest advanced draft of the Strategic Action Programme (SAP), and endorsed the proposed institutional arrangements for SAP implementation which would consist of a Consortium of countries and partners.

The BOBLME Project has been working closely with a range of bodies and organisations operating in the Bay of Bengal in order to improve coordination of activities and enhance impacts.

The Bay of Bengal Programme Inter-



Masterful chairman: Tarun Shridhar.

Governmental Organization (BOBP-IGO), International Collective in support of Fish-workers (ICSF), International Union for the Conservation of Nature (IUCN), United Nations Environment Programme of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities

(UNEP-GPA), South East Asia Fisheries Development Center (SEAFDEC) attended the meeting (while WorldFish and the South Asia Cooperative Environment Programme (SACEP) - were unable to make it).

The partners made a valuable contribution to proceedings and expressed their willingness to play an ongoing major role in the remaining BOBLME activities and future SAP implementation.

The meeting was masterfully chaired by Tarun Shridhar, Joint Secretary of the Ministry of Livestock and Fisheries India, but sadly the PSC meeting was his BOBLME swan song as he is moving from New Delhi to a new role with the State Government of Himachal Pradesh. We wish him all the very best!

The PSC meeting report can be found at <http://www.boblme.org/documentRepository/BOBLME-2013-Project-01.pdf>.

Scientists sharpen comms skills

The BOBLME Project has been delivering its science communications training programme, comprising two one-week courses on science writing and science presentation, since 2010.

Now two professional bodies have latched onto the course as a way to improve the quality of material being presented at scientific a and, moreover, the quality of scientific publications.

The Sri Lanka Association for Fisheries and Aquatic Resources (SLAFAR) has been using BOBLME techniques since 2012 to better prepare scientists for the annual SLAFAR meeting and to improve the quality and timeliness of the SLAFAR Proceedings.

This year, SLAFAR, funded by the BOBLME Project, held a scientific writing workshop in April to complete the papers from the 2012 SLAFAR proceedings. Then it held a science presentation course in preparation for the 2013 annual meeting, followed by a second science writing course, to finalise the papers from that meeting.

Participants had an opportunity to discuss their presentations with their peers as well as expert tutors, to present their papers in front of a scientific community, and to build up confidence.

Most importantly, they had a chance to discuss and get clarification on their problems, difficulties and concerns when preparing and presenting a research abstract.

A total of 62 scientists from more than 12 institutes from all over Sri Lanka undertook the training.

The chief facilitator of the course was Dr Sevvandi Jayakody from the Wayamba University, supported by Prof E Vivekanandan of the Central Marine Fisheries Research Institute, India, and Prof J M P K Jayasinghe, and Dr M D S T de Croos, from Wayamba University.

At the end of the writing course, the students were asked to submit the



One of the young scientists on the SLAFAR course gets advice on creating the skeleton of a manuscript.

finished papers to the *Sri Lanka Journal of Aquatic Sciences*, which will prepare a special edition showcasing their work.

The Marine Biological Association of India (MBAI) also delivered the BOBLME Science Communications training course in 2013.

The course, funded by BOBLME, was aimed solely at Indian marine scientists in the early years of their careers. Fifty two scientist applied to join the training, from whom 20 trainees from eight cities and 14 institutions were selected.

The workshops were organised by Dr K Sunil Mohamed of the Central Marine Fisheries Research Institute (CMFRI) who is also the Secretary of MBAI.

The course was conducted by Australian expert Dr Peter Rothlisberg with the assistance of five mentors: Dr Sevvandi Jayakody and Dr W M H Kelum Wijenayeke, both from Sri Lanka, and Dr E Vivekanandan, Dr S Ajmal Khan and Dr V Kripa, from India.

Each participant received an electronic copy of his or her presentation,

filmed by professionals. In addition, there were short tutorials on preparing posters for scientific meetings and dealing with the media.

Dr Rothlisberg reported that participants were very enthusiastic, and by and large the delivery of talks was "very proficient and articulate" and use of Power-Point was "also of a high standard".

He noted, "Better engagement comes with confidence and then experience ... increased confidence was evident even during the four-day workshop."

Feedback from the students was very positive. Almost all participants "Strongly agreed" or "Agreed" to all six questions about suitability and organisation of the Workshop. All said, too, that they would recommend the course to a colleague.

"Overall I think both workshops went very well," Dr Rothlisberg reported. "Clearly the selection process used by MBAI to vet participants paid dividends."

Gender report praised

The BOBLME project report, *Mainstreaming Gender in the BOBLME Project: Gender audit and recommended actions for mainstreaming a gender perspective* by Dr Cecile Brugere has been featured on the highly influential Genderaquafish.org website.

Genderaquafish was lavish in its praise: "Most marine and fisheries development projects are gender blind, even though, in recent years, they generally pay much more attention to reaching out to fishing communities.

"What does a major, multi-country project do when it wants to get serious on overcoming its gender-blindness? For sure, the project partners face a steep learning curve, but the ... BOBLME Project has taken the plunge.

"In 2012, it commissioned a major study by Cecile Brugere to help work out where they stood and what to do. BOBLME has now published Dr Brugere's report ... and it is a very useful guide with wider relevance than just BOBLME.

"It is a veritable 'how to' and literature review from which new and even experienced practitioners can learn a lot. Also significant is that this is the first of the Global Environment Facility (GEF) supported Large Marine Ecosystem projects to undertake a thorough gender audit."

Key recommendations of the report are:

- Commissioning of a gender-sensitive review of legislation and regulatory frameworks in the BOBLME partner countries;
- Following through the mainstreaming of gender in the National Action Plans, mirroring what has been proposed to mainstream gender in the Strategic Action



A woman sets fish out to dry.

Photo by McKay Savage

Programme;

- Tackling gender-disaggregated data collection as soon as possible;
- Ensuring the continuous provision of gender inputs throughout the project duration;
- Strengthening the participatory processes undertaken so far by the Mainstreaming Gender project;
- Avoiding falling in the Women In Development rhetoric and maintaining a focus on the addressing of gender issues and inequality.
- Supporting gender training and capacity building at all levels, beyond the

life of the project.

The BOBLME Project Regional Coordinator, Dr Chris O'Brien, noting that this is probably the first gender audit undertaken by any of the 20 or so Large Marine Ecosystem Projects in the world, said it was "great to get such recognition" from the Gender in Aquaculture and Fisheries community.

The Gender in Aquaculture and Fisheries community, which runs the website, is devoted to the exchange of information on gender in aquaculture and fisheries from all parts of the world.

The report may be downloaded from the [BOBLME website](#).

Author 'surprised and delighted'

The report's author, Cecile Brugere, says she was surprised at the attention it has received. She told the *BOBLME Newsletter*, "I was actually quite nervous when I submitted the report because I knew the stakes were high.

"A concern I always had in the back of my mind when I was writing the report was to provide recommendations that were as practical as possible. I think sometimes non-gender specialists get scared when they hear all the gender rhetoric and there was a danger of falling in that trap.

"So I am really delighted to hear that the report and its contents are proving useful to the BOBLME project. I think some of the recommendations could also be applied to other projects.

If this happens - for example if there is a wider uptake in other projects or natural resources contexts - it will be an indicator that an important impact has been achieved. It would be amazing!

Dr Brugere is an economist by training, holding an MSc in Ecological Economics and gaining her PhD in Agricultural Economics 10 years ago.

She became interested in the topic of

gender in 1998, while working as a research assistant at the Institute of Aquaculture in Stirling in Scotland.

"I was asked to investigate the social and economic issues surrounding the adoption of small-scale cage aquaculture in Bangladesh. How women participated in this activity and, more importantly, what they gained from it (or not), was critical to the adoption of the technology and it opened my eyes on 'gender' as a factor of key importance in aquaculture development and as a topic in its own right."

She found that very little, if anything, had been done on gender in the context of fisheries and aquaculture at the time. "So



Cecile Brugere

there were opportunities to seize to raise awareness about gender issues and equality in fisheries and aquaculture in both the academic and development practitioners' communities."

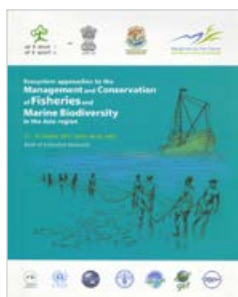
She is happy with the way the BOBLME report turned out. "I read the report again recently and I think some parts could be tightened. However the fundamental messages about how to mainstream gender effectively are in the report, and I would not change them."

She says she would like to continue her involvement with the Project. "The report suggests that a gender expert should be involved at some key stages of the project, for example in the finalisation of the Strategic Action Plan (SAP).

"I would be very interested to do this as I feel I have got to know the project quite well and I will be interested to see how the recommendations I made will be used. I believe the BOBLME project is very committed to addressing gender issues, and, in this sense, exemplary amongst all the other large marine ecosystem projects.

BOOKSHELF

MANGROVES FOR THE FUTURE (MFF) of the International Union for Conservation of Nature (IUCN), and the Ministry of Environment and Forests (MoEF), India, in partnership with BOBLME, FAO, UNEP, SEAFDEC and CMFRI, recently organized the Regional Fisheries Symposium on "Ecosystem Approaches to the Management and Conservation of Fisheries and Marine Biodiversity in the Asia Region" (Kochi, India, 27-30 October 2013).



The *Book of Extended Abstracts* produced for the meeting presents 35 abstracts, grouped into the five symposium themes: Coastal Ecosystems - Towards an Ecosystem Approach to Fisheries Management; Spatial Planning, marine Protected Areas and Fisheries Management; Artisanal Fisheries, Livelihood and Biodiversity; Exploring the Issues of Bycatch and Bycatch Management; and Bycatch, Sharks, Marine Turtles, and other Endangered and Threatened Species. Full symposium proceedings are under preparation.

The abstracts can be downloaded at <http://www.mangrovesforthefuture.org/assets/Repository/Documents/Regional-Fisheries-Symposium-Book-of-Abstracts.pdf>



MFF-IUCN INDIA OFFICE, IN PARTNERSHIP with MoEF, India, published in 2012 the book entitled *Coral reefs in India - status, threats and conservation measures*. This 305-page, richly illustrated book was edited by JR Bhatt, JK Patterson Edward, DJ Macintosh, and BP Nilaratna.

It contains 26 articles, contributed by various Indian marine scientist, and arranged under the four themes: Coral status and conservation; Coral associates; Reproduction, recruitment and restoration; and Coral environment and threats, and is a result of a workshop held at the

Suganthi Devadason Marine Research Institute (SDMRI) in Tuticorin. The geographical coverage of the book encompasses the four major reef areas in India: the Gulf of Mannar, the Gulf of Kachchh, Lakshadweep, and the Andaman & Nicobar Islands. It can be downloaded from mangrovesforthefuture.org

FOLLOWING ON FROM the *Field Guide to Sharks of the Southeast Asian Region* authored by Ahmad Ali and Annie Lim Pek Khiok of Malaysia and published by the Southeast Asian Fisheries Development Center (SEAFDEC) in 2012, the same two authors, now joint by Fahmi and Dharmadi of Indonesia, authored the *Field Guide to Look-alike Sharks and Rays Species of the Southeast Asian Region* as SEAFDEC MFRDMD Special Publication 22.



On 107 pages, the authors present on opposing pages those elasmobranch species which are easily confused in the field.

The book covers 15 pairs of sharks, 20 pairs of rays and two pairs of skates and is intended to improve the knowledge of regional taxonomists and fisheries enumerators on identification of sharks and rays in their catch data reporting from various fisheries of the region.

This book responds to a real need, as many species look very similar and are difficult to identify even for experienced taxonomists. Download the book from www.seafdec.org.my

DIARY

January 2014

- 9-20 Socio-economic monitoring training, in partnership with Fauna & Flora International and Mawlamyine University, Myanmar.
- 19-21 South Asia Meeting on Coastal Zone Management, Centre for Science and Environment, India.
- 20-30 Essential Ecosystem Approach to Fisheries training course (with training-of-trainers) in partnership with SEAFDEC and REBYC II CTI Project, Thailand.
- 21-22 International Conference on Conflict Resolution and Sustainable Fisheries Governance in Palk Bay, University of Colombo, Sri Lanka.

February 2014

- 11-12 Marine Protected Areas Working Group meeting, in partnership with WorldFish, Malaysia.
- 11-14 Regional Workshop to support the implementation of IOTC Resolutions, in partnership with IOTC, Malaysia.
- 11-13 Bay of Bengal Ecosystem characterization workshop, in partnership with CSIRO, Thailand.
- 25-26 BOBLME National Coordinators Meeting and Annual Planning Workshop, Thailand.

March 2014

- 06-08 Sub-regional workshop on nutrient pollution, in partnership with SACEP, Sri Lanka.
- 24-29 Short course on remote sensing of potential fishing zones and ocean state forecast, ITC Ocean and INCOIS, India.

April 2014

- 02-03 5th BOBLME Project Steering Committee Meeting, Maldives.

THE INTERNATIONAL COLLECTIVE in Support of Fish Workers (ICSF), in collaboration with BOBLME, has designed and published a small, colorful brochure entitled *An Ecosystem Approach to Fisheries*.

This publication is intended to complement various existing training course materials for use of fisheries managers and administrators and related government staff, and has been designed for the work with fisheries resource users and communities.

The illustrations of the booklet, combining photos with graphics and sketches, are accompanied by small text statements, covering some features of marine ecosystems, such as connectivity, life cycles, food webs and impact of pollution and feature nine principles of the EAF, from balancing human-wellbeing and ecological well-being to capacity building for improved governance.

The booklet can be downloaded from the ICSG website at http://www.icsf.net/images/EAF_final_26Nov13_1.24pm.pdf



CLIMATE CHANGE AND AGRICULTURAL food production - impacts, vulnerabilities and remedies by Golam Kibria, A K Yusuf Haroon, and Dayanthi Nugegoda reviews and summarises research results and information from both developed and developing countries including Asia-Pacific, Australasia and other parts of the world.

287 pages, ISBN 978-93-81450-512. Published by New India Publishing Agency www.nipabooks.com.

