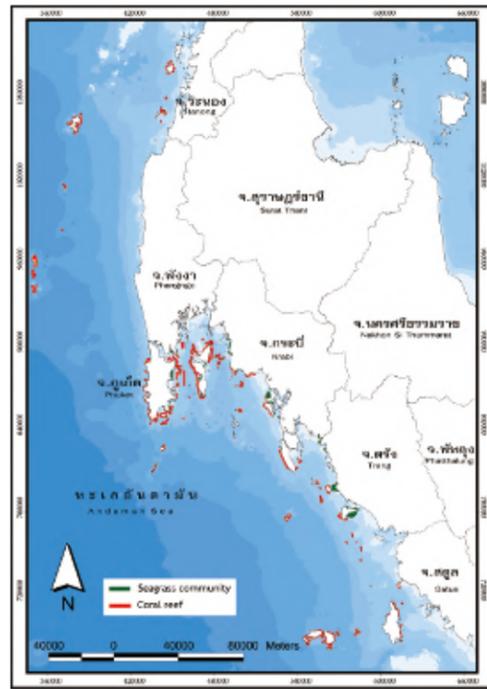
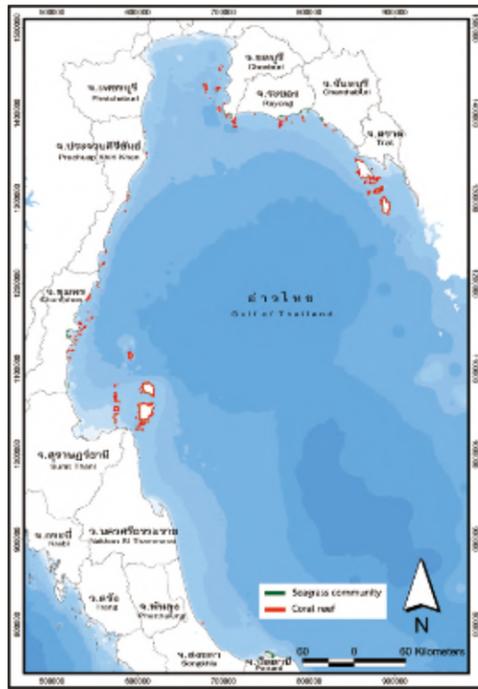


Thailand

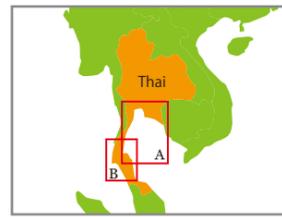
Assessing the Conditions of Coral Reefs and Seagrass Communities in the Gulf of Thailand and the Andaman Sea (Oct. 2010~Sep. 2020)



map:A



map:B



Project Location:

- Inner Gulf of Thailand: Chonburi Province
- Eastern Gulf of Thailand: Rayong, Chantaburi, Trat Provinces
- Western Gulf of Thailand: Phetchaburi, Prachuap Khirikhan, Chumphon, Surat Thani, Nakhon Si Thammarat, Songkhla, Pattani Provinces
- Andaman Sea: Ranong, Phangnga, Phuket, Krabi, Trang, Satun Provinces

How the project began

The project has been implemented because of the degradation of coral reefs and seagrass communities, as well as the decrease in ecosystem services in Thai waters in the face of global change. The main cause of coral reef degradation is coral bleaching, therefore enhancing coral reef resilience is needed.

The Department of Marine and Coastal Resources (DMCR) initiated the project with consultation among government agencies and local communities. The Department of National Parks, Wildlife, and Plant Conservation (DNP), Marine Biodiversity Research Group, Ramkhamhaeng University (MBRG-RU), and other Thai universities worked in several locations to support the project.

Description of the project

Coral reefs and seagrass communities in the Gulf of Thailand and the Andaman Sea are complex ecosystems with high biodiversity. These ecosystems are connected to terrestrial ecosystems, especially nutrient cycling, energy transfer, and connectivity of larvae and adult populations of marine animals. Ecosystem services from coral reefs and seagrass communities are very important to the socioeconomics and lifestyles of coastal communities, particularly incomes from fisheries and tourism industries. However, some coral reefs and seagrass communities in Thailand have been damaged by natural and anthropogenic disturbances, such as coral bleaching, sediment from coastal development, destructive fishing, and unmanaged tourism. The project highlights the importance of

Objective(s)

The objectives of the project are as follows:

- To assess conditions and long-term changes of coral reefs and seagrass communities in Thai waters
- To analyze the causes of coral reef and seagrass degradation
- To examine the recovery potential of degraded coral reefs and seagrass communities and their resilience to environmental change
- To gather information in the geographic information database of DMCR

the long-term assessment of coral reefs and seagrass communities with analyses of the root causes of degradation. The results from the project are necessary for establishing appropriate management strategies and interventions. Although the project is mainly implemented by government agencies, certain local communities and NGOs have been actively involved in the planning, implementation, and evaluation phases of the project. Preventive measures for coral reef and seagrass conservation are very important in accomplishing the project goals and require close collaboration with the local communities for their understanding and support concerning watershed and coastal management.

What has been achieved

Coral reef conditions varied among reef sites because of the monsoon influence, levels of degradation from coral bleaching, and human activities. The following are some of the findings from the research. The 2010 coral bleaching event caused severe mass mortality of corals (80% to 90%) in several reefs in Krabi and Phangnga provinces. Coastal development activities, tourism-related activities, wastewater and solid waste from coastal communities, and destructive fishing practices resulted in degradation of coral reefs in Rayong, Surat Thani, Songkhla, and Phuket provinces.

Conditions of seagrass communities showed seasonal variations and some impacts from human activities, such as sediment from coastal development for tourism; wastewater from industries, shrimp farms, and coastal communities; destruction by clam dredging, trawling, and push nets; and dredging and construction of the breakwater.

Several management strategies were proposed, such as zoning for utilization, controlled tourism activities and fishing practices, preventive measures for impacts from watershed and coastal development, local community participation for management, and the raising public awareness and education.

Lessons learned

The project provides essential information required to make management decisions and to establish proper policies for coastal resource conservation. Long-term ecological and socioeconomic monitoring of coral reefs and seagrass communities is important to understand the extent, nature, and causes of the damage and to identify ways to address these threats. Integrated coastal management, especially watershed and terrestrial ecosystems management, is very important in the prevention of threats from coastal development, land-based pollution, tourism impacts, and illegal fishing. The results from this project are essential to inform stakeholders about the success or failure of management actions and to apply adaptive management where they have not been successful in achieving goals. This project suggests that co-management of coral reef and seagrass resources by government agencies and local communities, with advice and assistance from researchers, can be an effective management strategy for marine and coastal conservation.



Main organizer(s) and stakeholder(s) of the project

Department of Marine and Coastal Resources (DMCR), Department of National Parks, Wildlife and Plant Conservation (DNP), Marine Biodiversity Research Group, Ramkhamhaeng University (MBRG-RU)

Department of Marine and Coastal Resources (DMCR), Department of National Parks, Wildlife and Plant Conservation (DNP), Department of Fisheries (DOF), Pollution Control Department (PCD), Marine Department (MD), Office of Natural Resources and Environmental Policy and Planning (ONEP), Department of Tourism, Tourism Authority of Thailand (TAT), Coastal Provinces, Coastal Local Administrative Offices, Marine Biodiversity Research Group, Ramkhamhaeng University (MBRG-RU), Thai universities and NGOs

Summary of case-study projects from different regions and an analysis of effective community-based approaches emphasizing land-sea connectivity

Examples from different countries indicate that a common problem of environmentally influential factors originated on land and included domestic wastewater and waste, sediment, and chemical substances from agricultural chemicals on farmland discharged into coral reefs affecting the ecosystem. In particular, the project on the island of Komodo, a remote island in Indonesia and a World Heritage Site, is being implemented using the problem of waste disposal caused by increased numbers of tourists and a resident management system with an insufficiently developed infrastructure as the major theme. Meanwhile, in Japan, the sediment discharged from farmland for more than 40 years has been affecting the ecosystem of coastal coral reefs for a long time, and projects are being implemented in cooperation with prioritized local communities. Other project themes in the Maldives and Fiji include the promotion of administrative systems to protect the environment and the tourism industry as well as a reduction in the overexploitation of fisheries. Overviews of activities in different regions are described below.

FIJI

The problems faced by the Kubulau District include a reduced number of fish species from overfishing and the influences of outflows from illegal mines. The KRMC was organized by representative residents and took the initiative to establish an ecosystem-based management plan. Residents are implementing conservation activities in cooperation with conservation supporters. The regional organization KBDC was recently established to support KRMC. Natural science researchers and social researchers evaluated traditional environmental knowledge and established a comprehensive management plan covering the terrestrial ecosystem and the freshwater and coastal ecosystems. The goal is to establish a system to distribute funds raised through eco-tourism and local industries to develop local communities and as an environmental management fund.

INDONESIA

The island of Komodo, a World Heritage Site, and nearby islands are the habitat of the Komodo dragon and now face the problem of inappropriate dumping and disposal of waste from increased tourism on the islands. A project in Indonesia is establishing a system for reusing, recycling, and properly disposing of wastes with local people. The project established an industrial organization to reuse and process waste for use by local communities and then set up training groups of women to learn the skills to transform recycled items into handicraft goods.

JAPAN

A project of WWF Japan since the 1970s is to prevent the outflow of sediment from sugarcane fields with local communities in prioritized regions. External researchers and organizations specialized in natural science and social science are participating in this project. They are identifying prioritized farmlands to work on and monitoring the amount of outflows and then provide information to local conservation organizations in order to build a system to implement continuous investigations and conservation activities by the local people. They are also applying this model to other regions.

USA

The project in the United States is the conservation activities for the ridge-to-reef approach to handle the effluent from West Maui in Hawaii by the local people. The project involves people in the local tourism industries, such as the Ocean Friendly Landscape Program, to investigate the amount of chemical substances and reduce effluents by emphasizing close communication with local residents, tourism organizations, and primary industry organizations. The project is being implemented in cooperation with local communities during the proposal phase by focusing on setting plans that match the traditional values of West Maui.

AUSTRALIA

Projects in Australia have been implemented to educate and increase the number of Reef Guardians as a community-based approach to improve the ability to recover and regenerate coral reef ecosystem. The projects promote the conservation of the Great Barrier Reef by supporting regions and stakeholders in the various industries that continuously take advantage of the reef environment. The projects have provided classes in more than 300 schools in different regions, and more than 12,000 students have participated in conservation activities. In addition, as a model incorporating fisheries and agriculture, the projects are improving the quality of sediment and water released from the primary industry by supporting and spreading the activities of

motivated farmers and farm owners as models.

GRENADA

AusAID and GBRMPA transferred the conservation scheme of the Reef Guardian Program in the Great Barrier Reef in Australia to Grenada in 2013. The projects are reviewing the use of chemical fertilizers by farmers in target areas and providing training opportunities to farmers and people involved in agriculture as efforts to link the management of environmentally influential factors on land with the conservation of coastal areas.

MALDIVES

The project in the Maldives is named Regenerate and is based on an approach of resilience-based management. The project supported the improvement of technologies and knowledge of government policy officials and then provided workshops for resident leaders and resort industry managers as a part of training opportunities. The project investigated the coral reef ecosystems and the use of the coastal environment by people to reflect findings about the use of the local environment and conservation management plans. The project is creating maps of the findings and conducting social investigations in eight target communities to create conservation plans.

THAILAND

Coral reefs and algae populations are being reduced because of the outflow of waste and wastewater from coastal communities, development, overfishing, and tourism along coastal areas. The project in Thailand is conducting a long-term survey on these problems and proposing the establishment of conservation plans with the government, local communities, and NGOs. The implementation of the plan includes providing opportunities for local residents to improve their understanding and promoting joint efforts in the conservation management of coastal and ocean areas. The project has proposed plans to set restricted areas, sustainable systems for fisheries and tourism, and environmental education for local residents.

The following are common points that have been found effective or important across different regions in implementing comprehensive and community-based management covering the land to the ocean.

- *It is important to facilitate communication involving as many residents as possible based on traditional uses of the environment in a specific region and information acquired through scientific investigations.*
- *Participation of young students and children, encouragement for senior citizens who have difficulties in communication, and the establishment of long-term conservation targets are effective ways to spread activities throughout the entire community.*
- *It is important to understand the constraints and incorporate the requests of industries and producers who may be the source of environmental impacts when asking for their cooperation in conservation.*
- *Activities with leaders of local communities and residents as well as the development of a system involving administrative and legislative officials are important.*
- *It is necessary to adaptively review activities based on the latest information and status when implementing activities in cooperation with local communities.*

The above are also important categories common to local projects in any region. These will prove effective hints to activities when readers are to implement similar activities in their regions if they consider the main points of these categories from the proposal phase to the implementation phase of plans.

Other points to be considered in the design phase of a project and at the start of a project based on lessons learned in different regions are as follows: ensuring the participation of stakeholders, especially core persons and landowners in the early phase and adding their concerns, difficulties, and requirements as points for consideration. Other opinions include investigations and projects that should be designed to include as broad an area as possible for implementing the management of the entire basin from the land to the ocean. Another opinion is that financial support for non-profit activities is effective in ensuring cooperation between a project and target areas and the implementation of activities by local stakeholders.

Based on the above, comprehensive community-based management from land to the sea should target as large an area and as many communities as possible depending on funding and manpower availability. The following are also necessary: identification of traditional culture and social systems of a region in the early phase and planning of a project; proposal of a plan based on scientific investigations; involvement of landowners, community leaders, and government and legislative officials; and the implementation of a project to the extent that they can provide support. The project implementation phase requires the distribution of financial and technical support and information to local groups that are implementing the project in addition to leaving room for flexibly changing plans and stakeholders who support the project depending on the situation. The diagram on the following page summarizes the key elements to be considered at the project proposal phase and subsequent phases based on the above observations.



Enabling conditions to consider in the different project phases

Keys to an effective approach for the planning and implementation of community-based coral reef conservation and management projects emphasizing land-sea connectivity



Contact person and information of each case-study project

Country	Project	Organization	Contact Person(s)	E-mail	Postal Address	Phone	URL
Fiji	Community-Based Integrated Land-Sea Management in Kubulau District: Fiji's first District-Level Ridge-to-Reef Management Plan	Wildlife Conservation Society Fiji Program	Sangeeta Mangubhai	smangubhai@wcs.org	11 Ma'afu Street, Suva, Fiji	+679 -331-5174	http://www.wcsfiji.org/AboutUs/Wherewework.aspx
Indonesia	Integrated Waste Management (IWM): Building Partnerships for Effective Management of Komodo National Park	①Deputy Director of Utilization of Environmental Services, Ministry of Forestry ②WWF Indonesia and Komodo National Park ③Komodo National Park	①Cherryta Yunia ②Wawan Ridwan ③Helmi	①Cherrytays@yahoo.com ②wridwan@wwf.or.id	①Manggala Wanbakti Bld., Block VII, 7th Floor, Gatot Subroto Str, Jakarta 10270 Indonesia ②Gedung Graha Simatupang Tower2 unit C Lantai 7, Jl. Letjen TB Simatupang Kav, Jakarta, 12540, Indonesia	①+62-21-572-0229 ②+62-21-728-9461 ③+62-81-34111-2323	http://www.wwf.or.id/en/news_facts/blog/?33523/Komodo-Island-Trash-Does-Not-Turn-Into-Cul-De-Sac
Japan	Establishment of Community Based Management (CBM) in the Nansei Archipelago Region and Reinforcement of Eco-Friendly Village at Shiraho Community	WWF Japan	Masayuki Gonda Masahito Kamimura	masayuki@wwf.or.jp	WWF Coral Reef Conservation and Research Center, Shiraho118, Ishigaki, Okinawa	+81-980-84 4135	http://www.wwf.or.jp/activities/2015/07/1272007.html
USA (Hawaii)	West Maui Ridge to Reef Initiative, Hawaii	Coral Reef Alliance (Ridge to Reef Initiative, West Maui Soil and Water Conservation District)	Tova Callender	tova@westmauiR2R.com	55 Konale Pl., Kihei, HI 96753, USA	+1-808-214-4239	http://www.westmauir2r.com/
Australia	Reef Guardian Stewardship Program	Great Barrier Reef Marine Park Authority	Ben Palmer	ben.palmer@gbmpa.gov.au	Townsville head office, 2-68 Flinders Street, PO Box 1379, Townsville, QLD 4810	+61-7-4750-0700	http://www.gbrmpa.gov.au/our-partners/reef-guardians
Grenada	Reef Guardian Stewardship Program in Grenada	Reef Guardian Stewardship Program: Grenada	Roland A. Baldeo	rolandbaldeo@gmail.com	Melville Street, St. George's, W.I., Grenada.	+1-473-440-3814 (Mobile)+1-473-417-2966	https://www.facebook.com/GMPANetwork
Maldives	Project REGENERATE: Reefs Generate Environmental and Economic Resiliency for Atoll Ecosystems	IUCN	Ameer Abdulla	ameer.abdulla@iucn.org	2nd floor, H. Merryrose Male, Maldives	+34-654-980-909	https://www.iucn.org/about/work/programmes/marine/marine_our_work/gmpp_coral_reefs/gmpp_coral_reefs__projects/gmpp_project_regenerate_maldives/
Thailand	Assessing the Conditions of Coral Reefs and Seagrass Communities in the Gulf of Thailand and the Andaman Sea	①Marine and Coastal Resources Research & Development Institute ②Marine Biodiversity Research Group, Faculty of Science, Ramkhamhaeng University	①Nipphon Phongsuwan ②Thamasak Yeemin	①nipphon.ph@dmcr.mail.go.th ②thamasakyeemin@yahoo.com	①9th Floor, the Government Complex Building B 120 Chaengwattana Road Lak Si, Bangkok, 10210, Thailand ②Ramkhamhaeng University, Huamark, Bangkok 10240, Thailand	①+66-2-1411-3412 ②+66-2-310-8415	http://marinegiscenter.dmcrc.go.th/km/coral_doc17/?lang=en#.VjczG51cck

RESOLUTION on promoting an integrated approach to community-based coral reef conservation and management emphasizing land-sea connectivity

Adopted on 23 October 2014, at the 29th ICRI General Meeting (Okinawa, Japan)

Noting that fringing reefs are found extensively in Okinawa, Japan, where the 29th ICRI General Meeting was held from 20-23 October 2014;

Recognizing that coral reefs, especially fringing reefs, are heavily influenced by land-based activities, it is particularly important to consider human activities and impact as part of the measures for coral reef conservation;

Emphasizing ICRI's cornerstone on integrated management, specifically to manage coral reefs and associated ecosystems in a manner that recognizes the connectivity of land and sea, and the impacts of anthropogenic pressures;

Recalling the "Resolution on using co-management approaches for marine protected areas and other mechanisms for managing coral reefs and associated ecosystems" adopted at the 28th ICRI General Meeting in Belize City, Belize;

Recalling the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA);

Recalling the GCRMN report *Catchment Management and Coral Reef Conservation: a practical guide for coastal resource managers to reduce damage from catchment areas based on best practice case studies published in 2011, which introduces 11 recommendations for catchment management;*

Noting the decision of the Twelfth Meeting of the Conference of the Parties to the Convention on Biological Diversity on marine and coastal biodiversity, which includes priority actions to achieve Aichi Target 10 for coral reefs and closely associated ecosystems.

Accordingly, ICRI encourages its Members to:

Consider the merits of integrated approaches to community-based coral reef conservation and management emphasizing land-sea connectivity;

Apply the lessons learned on watershed management for conserving fringing reefs from the cases presented in the workshop at the 29th General Meeting and in the GCRMN report, as appropriate;

Promote, where appropriate, collaboration among stakeholders that facilitate community-based conservation and management efforts that integrate the conservation and management of the relevant watersheds;

Contribute to the sharing of information and experience in fora provided by relevant conventions, organizations, or initiatives.

Accordingly, ICRI requests its Secretariat to:

Compile the case studies on integrated approaches to community-based coral reef conservation and management emphasizing land-sea connectivity from submitted ICRI Members' Reports and organize with reference to the GCRMN report;

Report on the compilation of the above case studies at the 30th General Meeting in Thailand;

Disseminate the information through ICRI Media and other available and appropriate media.

Accordingly, ICRI requests its Members to:

Assist in the compilation of case studies by providing information in addition to the submitted Member' s Reports, upon request from the ICRI Secretariat;

Encourage similar integrated approaches to community-based coral reef conservation and management emphasizing land-sea connectivity, where appropriate, that would have long term benefits;

Support the ICRI Secretariat in disseminating the compilation of case studies.



Case Studies: From Ridge to Reef

Implementing coral reef conservation and management through a community-based approach emphasizing land-sea connectivity

Publisher: ICRI Secretariat, c/o Biodiversity Policy Division, Ministry of the Environment
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Date published: December 2015